CAPITAL ACCUMULATION AND ITS IMPLICATIONS FOR THE FAMILY FARM IN CANADA

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ABSTRACT

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The purposes of the study were twofold: to analyze data on capital assets at the aggregate level for Canada and the provinces in order to examine the relationships between capital, farm income, and real gains from price-sensitive durable assets; and to demonstrate the practical usefulness of recursive linear programming as a planning and extension tool.

Provincial data on value of land, buildings, machinery, and livestock were analysed and annual real gains from them were estimated for the forty-year period between 1926 and 1965. The method used was developed by Boyne and employed the Taylor series expansion of V=PQ to separate changes in the physical quantity of assets from changes due to variations in price. In the process a "constant value" time series of agricultural assets (valued at 1935-39 prices) was obtained. It indicated that the volume of physical capital employed in agriculture has not grown very much in the period examined. There is, however, a definite trend of farm consolidation (fewer and larger units) and intensification (more machinery per unit of land).

The analysis showed high interregional variation both in capital gains and real gains as well as considerable variation from year to year. In all provinces and all years estimates of capital gains exceeded those

of real gains, even to the extent of a difference in sign between the two magnitudes.

A major conclusion of the analysis was that real gains (much less capital gains) should not be considered as a supplement to conventional realized income. The high variability of real gains and losses from price-sensitive production durables would lead to heavy discounting of them by the entrepreneur when planning consumption, saving, and productive investment.

No clear relation was definable between capital and income due to the level of aggregation of the data.

The recursive programming analysis simulated the growth over 20 years of five farms facing identical initial resource endowments, production functions, and exogenous conditions. They differed only in the operators' attitudes to use of credit, employment of hired labour, and consumption. The results showed how individual attitudes to these factors, governed by subjective preferences, can have far-reaching effects on resource allocation and productivity, rate of growth of the firm, net worth and total assets at the end of the period, and on levels and rates of growth of consumption.

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CHAPTER 1

Introduction

The past two decades have seen students of North American agriculture and the formulators of the policies which are intended to govern its development placing increased emphasis on problems of size of operation, growth of the family farm, capital accumulation and its financing. During the same period it has become apparent that on the one hand there exists aggregate over-capacity in agriculture while on the other, at the level of the individual farm, problems of insufficient size handicap many producers. Related to this is the phenomenon of reduced profitability in farming--at least in terms of returns to agricultural labour and management--relative to the nonfarm sector.

Much of what has been said in relation to these phenomena has been confined to a description of symptoms. Low income, relative immobility of farmers, high intertemporal and interregional variation of income are all indications of one or more basic problems in the structure and performance of agriculture and the ability of the sector and its producers to react to changing economic and technological conditions. Recognition of a problematic situation and pinpointing its main symptoms is an important first step in arriving at a solution, but before an effective one can be formulated the problem itself must be carefully delineated and defined.

Analysis of a problem and development of a solution to it generally must begin with the ferreting out of the elements of the pro-

blematic situation. Once these have been discovered, it becomes easier to discern the partial relationships which influence and characterize the whole. Then a solution becomes the logical consequence of a valid examination of the parts and their causal influence on the whole.

Canadian agricultural policy has gone through a number of phases in terms of the objectives it was to have achieved. The difficulties which beset farmers in the thirties led to a switch in policy emphasis from settlement and development to price support and income stabilization. These goals remained throughout the postwar years although the measures enacted failed to achieve them fully. From time to time it has been suggested that the existence of low productivity and insufficient income in commercial agriculture stems from the concept of the family farm as the basic unit of agriculture. It has been claimed that the unit farmed by homesteaders became too small and economically nonviable as the cost of labour rose, technology changed, and economies of scale became evident in a sector which was declining in a developing economy. Others claim that it is not necessarily in the definition of the farm unit, but rather in the definition of farm income that the problem lies. Proponents of this approach contend that farmers' relative poverty or low incomes spring from the fact that only farm income in cash and kind are considered, while capital gains in fact represent a large supplement to farm earnings. If this is so, the argument continues, and farmers do in fact live poor but die rich in farming, it is at least to some extent a matter of their own choice.

They have chosen to allocate more to future consumption than to present consumption and have no one to blame but themselves.

One of the objectives of this study is to examine in the aggregate the structure of capital in Canadian agriculture and to attempt to find some indication of what capital gains have been in the period 1926 to 1965. More important than that is to examine the real gains from agricultural assets and to relate them both to the stock of capital and to farm operators' income.

A second objective, prompted by S.N. Kulshreshtha's study of farm incomes (36) is to examine these factors on a regional basis. If capital structure and real gains from agricultural assets behave with interregional variability as great as that found with respect to farm income, there would be strong evidence in favour of regionally differentiated agricultural policy as well as indications that research into economic problems of agriculture might prove misleading at the aggregate level and should probably be carefully stratified regionally.

A further object of this work is to examine briefly the concept and philosophy of the family farm in the light of estimated requirements of the farm firm in the closing decades of the twentieth century. Within this framework it is hypothesized that attitudes molded and tempered by the difficulties of farmers in the depression years and the search for security through full ownership have an important influence on allocation of productive resources. If this is in fact the case, then it would follow that productivity of agricultural resources

could be changed through a change in the attitude of farmers towards ownership and hence toward an economic size of farm unit and utilization of available credit. The combination of credit use and proper farm size may be the key to both living rich and dying rich in farming.

Within this framework, a simulation model based on recursive linear programming is employed to examine the effects of different attitudes to credit, consumption and employment of hired labour on the growth path of hypothetical farms. The farms face the same initial conditions, identical production functions and similar exogenous conditions.

This is of no small importance since the more interesting analyses along these lines up until now have either used polyperiod linear programming or nonanalytical simulation to study these phenomena. The former tool is not truly dynamic and cannot capture the full effect of uncertainties and unfulfilled yield and price expectations influencing the farmer's decision process. The latter, while capable of including probability distributions and complex interactions between the farm family and exogenous factors in simulating production and investment decisions, is not an optimizing technique. Recursive linear programming, on the other hand, is a truly dynamic tool. It can be made to optimize on a step by step, year by year basis. This allows for changing expectations and variable reactions to the gap between expected prices and yields, which serve as the basis for allocation and investment decisions, and actual net income which is realized after the

production decision has been made and exogenous factors come into play.

Relatively little analysis has been performed using recursive programming simulations at the level of the individual farm. More have been used at the aggregate level. Perhaps this is due to the large amounts of auxiliary calculations which must be executed when simulating decisions of a single farmer in order to move from the solution based on expectations and production decisions in year t, to the realized results in year t, which are governed by actual yields and prices in addition to production and investment decisions, and from there, to the formulation of the constraint vector for year t+1. These can be either tedious if done by hand after each solution is obtained, or relatively costly if programmed as a subroutine and added to the linear programming computer program. Be that as it may, recursive programming analysis of individual farms and their behavioral constraints can provide an interesting insight into the effects of certain attitudes on growth of the firm and its ability to escape from stagnation in a low level equilibrium trap.

Results from the analysis in this study indicate that recursive programming can prove useful as an extension tool and as a teaching device in tandem with other simulation techniques and management games. With the aid of these it is possible to demonstrate to farmers the effects of their decisions as compared to those of other farmers or hypothetical farmers, considered by the extension personnel to have "better" attitudes towards key issues governing the growth of the farm firm.

CHAPTER II

THEORY OF CAPITAL, INVESTMENT, AND ACCUMULATION

I CAPITAL--THE STOCK CONCEPT

What Is Capital?

In his book A Study in the Theory of Investment Professor Trigve Haavelmo points to a most perplexing situation. In his words

> It would seem rational and obvious that one should start a theory of capital by agreeing on what one is talking about, that is, by a definition of capital. However, strange as it seems, this question of definition has itself been one of the most controversial issues in the whole theory of capital (20, p. 43).

Elsewhere in the same book the author highlights one of the greatest difficulties of problem analysis---the question of the choice between simplicity of description and simplicity of explanation (20, p. 106). A choice of simple definitions of variables can present a complex set of technical and behavioristic relationships which could be almost impossible to isolate and understand, whereas the use of more abstract and loosely defined variables may facilitate the understanding of simple technological or behavioristic relationships but create difficulties from the point of view of a convenient classification of visible economic facts.

A difficulty encountered when trying to define what capital is stems from the nature of previous economic work relating to this concept. Much of the work on the subject has had the explanation of macroeconomic events and processes as its goal. The macroeconomist, the national accountant, and anyone else who wishes to handle aggregates of goods which aren't physically similar but at the same time are not conceptually very different has to worry about such things as the definition of capital. To the individual entrepreneur (including the farmer) the question is irrelevant to

his daily decisions. Insofar as this work relates to farmer-entrepreneurs and the reasons and methods of accumulating capital, it will discreetly avoid taking a stand on the relevance of the nature of capital to entrepreneurial decisions. Instead, and mainly for the sake of future generations of students, the following section will selectively indicate one or two of the points raised by developers of the theory of capital and surreptitiously drop a few names of important authors and works which might prove productive sources of knowledge or provide some insight into the complexity of the problem.

It would be agreed in most cases that there is a direct causal relationship between capital and output, that production can be allocated between consumption and nonconsumption or saving, and that saving in turn can be used to augment existing productive capacity. Eventually judicious allocation of output creates possibilities for greater consumption, greater saving, or both. Forgetting for the moment the problem of the precise definition of capital and linking it with the idea of productive potential, an individual who owns capital can achieve consumption in two ways: He can manipulate his capital, adding personal or hired entrepreneurial ability (and perhaps his labour as well), produce goods which can be sold on the market, ultimately obtain some purchasing power from the sale and, after covering his production expenses, consume whatever proportion he deems fit of net income or profits. On the other hand, assuming that his capital is not so specialized that only he can manipulate it to eventually arrive at a profit, the owner could sell or trade it on the market for whatever is felt to be its value to the purchaser. A third possibility, dependent on the divisibility of the capital, might be to produce with a portion of it and gradually sell or trade some each year or, a variant of the above,

produce nothing but each year sell a portion of the capital sufficient to provide a desirable level of living.

It appears then that capital is somehow related to purchasing power both indirectly through its connection with production of marketable goods and directly, through its exchange value on the market, caused by the desire of others to buy it for purposes of production.[1] Subsequent sections will touch on both the productive aspects of a capital stock and problems of its growth related to maintenance of a competitive position in the industry, and on capital as a stock of wealth, serving to satisfy the consumption needs of the farmer after he decides to retire.

The main body of classical capital theory does not much concern itself with the rate at which new capital is acquired but only with the final amount demanded under alternative possibilities of yield. The Bohm-Bawerk-Wicksellian theory of capital formation was essentially a theory of savings which tried to explain why people did not consume their whole net income and whether the rate of interest had to be positive in order that there be a positive amount of savings. The latter problem will not concern us here. The former will be discussed in Chapter IV.

Bohm-Bawerk denied that capital was a factor of production. To him it was an instrument of production--useful, even necessary insofar as man could derive more benefit from nature by devoting effort to producing tools and products that were not direct consumer goods. He viewed capital as a product of labour and natural resources, thought by many to be the

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[1] In the next chapter the equivalence of the purchasing power obtained by way of each of these relations will be examined.

only original productive factors. The problem of Bohm-Bawerk and Wicksell was this: If capital is a form of stored labour, then in the market different prices for capital and labour imply in effect different prices or market evaluation of current compared to stored labour. The explanation for the difference lay in the time element and roundaboutness, which found their expression in a certain rate of interest. According to Haavelmo, Bohm-Bawerk saw the source of productivity of capital in the roundabout procedure and not the actual amount of capital participating in a process. Hence the idea that capital deepening is the same as an increase in roundaboutness.

Wicksell's model of wine production serves to emphasize the ideas both of roundaboutness and of instrumentality of capital in production. In the production process of converting grape juice to aged wine the stock of capital goods (the stored grape juice) plays no direct technological role in creating the output. Time works as well on one bottle as on a large number of bottles in the transformation process. As Haavelmo states: "The amount of capital is not technologically instrumental. The collection of a physical stock is rather incidental to the process of bringing the time element to work" (20, p. 33). For the objectives of this work definition of capital as the "degree of roundaboutness" seems hardly operational since this indicates little about its value as a source of productive power.[2]

This approach fits that of Frank Knight that to consider capital as a revolving stock, each unit being invested for a given span of time,

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[2]Possibly roundaboutness could be of more use within the framework of the theories of saving and investment.

is meaningless in most cases (although this may be the basis on which many have chosen to use depreciation as the indicator for capital in production function studies). The description of capital as a store of land and labour resources does, perhaps, explain how capital is created, but does little to clarify its technological function in the production process or its role as a provider of security (or, in general, utility) for those who accumulate it on an individual basis through saving and net investment in their firms. As Haavelmo puts it (20, p. 41):

> The Austrian model also poses one of the fundamental problems of capital theory, the problem of choice between consumption and capital accumulation. It seems next to impossible to explain the phenomenon of capital accumulation except on the basis of some general notion of storage possibility as against a possibility of current consumption.

Spitz disregards what has been called previously the wealth component of capital and, as though Haavelmo's remark on "storage possibility" might be interpreted too loosely, hastens to caution that not all nonconsumption or saving automatically becomes capital; saved production can be lost due to deterioration, obsolescence, or nonuse.[3] He defines capital quite simply: "Capital is produced goods and services, saved from consumption (maintenance and direct satisfaction of man) and used by, or as part of, the human agent in further production" (53). Land is no different from livestock or fertilizer as capital in that man must expend his efforts to enjoy its fertility. Obviously, if all production is consumed, the chances for capital accumulation are negligible and, as mentioned above, the act of saving or even of reinvesting in the firm does not in itself

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[3] And, as shall be shown later, loss of purchasing power.

transform production into capital.

Spitz's definition will be accepted here with the addition that, since the family farm is not a perpetual entity but usually reconstituted or reborn once per generation as it is transferred from father to sons, the component of capital previously called "wealth" should be included in the definition as operationally necessary to understand the biological phenomenon of the decline of the capital value or productive capacity of the farm firm as its operator grows old and begins to dissave (22). The influence of the wealth component of capital on rate of growth of the firm and especially on the rate of growth of net worth, representing the farmer's retirement fund, is important. Understanding of this aspect may provide some insight into problems of what has often been described as irrational or insufficient use of external sources of finance by farmers. The degree of utilization of credit facilities has an impact on size of firm and total value of investment in farm enterprises and ultimately in their competitive standing in the industry. Of course, in order to know how much credit should be used by a firm one should know how much total investment is needed to achieve efficiency. The following section discusses certain points raised in works on theory of investment, which relate to the quantity of capital required by a firm.

How Much Capital Is Needed?

The problem of determination of equilibrium quantities of capital or scale of operation for the firm at any given moment has been studied extensively within the theory of the firm in general and specifically in works relating to theory of investment. Again, however, one faces the problem that much of the discussion on investment in the firm is presented

within a macroeconomic context where the capital-output ratio, the spectrum of techniques of production and their influence on changes in capital-labour substitutability within the economy and ultimate determination of the rate of interest are some of the issues demanding attention. Insofar as it is possible the review that follows will not touch on those issues. Similarly, it will not become involved in the controversy of what is the magnitude which the entrepreneur wishes to maximize. This problem, far from being unimportant, will be studied in later sections.

Mrs. Robinson distinguishes clearly between motivations of the peasant and of the entrepreneur:

> The morality of a peasant. . .is to put back into the soil what he takes out of it. . .so as to preserve productive capacity for the future, not only for his lifetime, or his children's lifetime, but for the future as such.
>
> . . . . . .
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> The morality of the entrepreneur echoes that of the peasant in a more extreme form. For him the purpose of earning profits is not to indulge in consumption but to preserve and expand his business. . .put business before family, . . .As much profit as possible should be invested in increasing productive capacity, and to be on the safe side, the amount of quasi-rent regarded as absorbed by costs should be set as high as is at all plausible (50, p. 39).

The exclusion of farmers (or peasants) from the entrepreneurial class and their description as producers doomed to stagnation because their "morality" dictates only preservation of productive capacity and not its expansion seems to serve no useful purpose. The farmer should be considered as a full-fledged entrepreneur, guided by a similar "morality," although his decisions may be tempered at times by an inability to separate completely family responsibilities from business demands or place long run business considerations over short run family requirements.

When Should An Investment Be Made?

Scale of plant and size of investment are determined on the basis of existing technology (the production function) and market prices for inputs and products. The production function yields a set of isoquants from which, when prices of factors are applied, can be derived a series of points representing the least cost allocation of factors for production of a specified level of output. The locus of these points represents the expansion path along which the firm should move to increase output within a given plant. Application of factor prices to the expansion path combinations of factors yields cost curves of production which, in conjunction with the firm's demand schedule for the products, can be used to determine its equilibrium level of production. An assumption of ex ante complete divisibility of production factors allows one to develop a series of short run average and marginal cost curves and a smooth, continuous long run average cost curve serving as an envelope to the group of short run average cost curves.

A firm may be in short run equilibrium although not in long run equilibrium. In such a case the producer would be equating short run marginal factor cost to marginal revenue product but the technology or size of plant in use would not permit production at the lowest possible average cost for his given volume of production. Hypothetically, the development of an enterprise follows a course from points of temporary disequilibrium to temporary (short run) equilibrium, converging on a point of permanent (long run) equilibrium. Given the assumption of complete divisibility and the capability to vary any or all levels of input, the only reason a rational producer would not be in long run equilibrium (i.e., on the long run average cost envelope) at a given moment would be his lag in reaction to changing

conditions. In all instances size of investment, scale of plant or productive capacity are determined on the basis of a specific level of desired output which is based on an analysis of cost and revenue structures.[4] As was shown by Lutz (42), this analysis is applicable only under very strong assumptions of timelessness of the production process, a constant fixed charge per unit period on the whole stock of equipment from one short period to the next and that the short run marginal cost curve is invariable for all unit periods during the lifetime of the equipment. Adding the assumption of a constant demand curve, the firm's operations would be identical from period to period and therefore profitability of investment could be determined on the basis of a static analysis of a single period.

Investment creates productive capacity which, when profitably utilized, generates income and profits. It seems logical that investment should be sustained only to the extent that capacity is fully utilized. This might imply that investment is dependent on output and changes in production, but on the other hand investment itself, and its utilization generate additional output, income, and profits. Causation between changes in investment and changes in output is difficult to pin down as far as its direction is concerned. Chenery has described a feed-back mechanism or a "pursuit curve" in which entrepreneurs attempt to balance capacity against output. Theories of Harrod, Samuelson, and Hicks have shown investment as a function of changes in output---not of the level of output itself. Kalecki and Kaldor considered it an increasing function of the level of output and a decreasing function of the stock of capital (50).

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[4]The question of perfect foresight versus uncertainty about the future is not important at this point. If uncertainty enters the picture the relevant costs and revenues will be adjusted to account for it.

Friedrich and Vera Lutz (42) developed a comprehensive body of rules to be followed when weighing an investment decision. It would be useful at this point to review a number of the principles and criteria developed by them. Emphasis will be placed on investment in durable capital goods: the point input--continuous output case, where all inputs embodied in the durable good are jointly responsible for the whole stream of output.

In their approach the authors did away with any need to calculate a true rate of depreciation or, as Wicksell put it: "to try and find out what part of a pasture goes into wool and what part into mutton" (42, p. 7). This was accomplished by developing a discounted cash flow where the quantitative relationship between physical input and output was irrelevant and the important factor was time, relative to the decision period, when incomes or expenditures were to be forthcoming.

> Both the results of capital theory and the failure of the search for the "true" depreciation method in accounting theory bring us to the same conclusion: that there is no uniquely determined method of allocating the costs of a durable good to successive operating periods during the goods' lifetime, and that the usual diagrammatic representation of the average fixed cost curve (and consequently also the average total cost curve) is inadequate as a means of dealing with durable good costs (42, p. 11).

The capitalization formula contains the following components:

V = estimated capital value of factor

C = initial cost of factor

Now, if

Q_t = quasi-rent[5] for period t

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[5] Quasi rent refers to revenue of the fixed factor before depreciation is deducted.

q_t = number of units of output sold in period t

$P_t(q_t)$ = market price of product

$E_t(q_t)$ = variable unit costs of production

T = scrapping date of capital investment

r = constant rate of interest

S = scrap value of equipment after T years

then

$$Q_t = P_t(q_t)q_t - E_t(q_t)q_t$$

$$V = \frac{Q_1}{1+r} + \frac{Q_2}{(1+r)^2} + \ldots + \frac{Q_T}{(1+r)^T} + \frac{S}{(1+r)^T}$$

Long-run ex ante profitability of an investment depends on the relationship of V to the cost of the equipment C. By solving for a rate of discount (ρ_a) which equalizes the two values one can find the internal rate of return of the investment. If instead the external rate of interest or an opportunity cost of capital is applied to obtain the capitalized value V - the ratio V/C produces a benefit-cost ratio also used by some as a criterion for investment. If the cash flow were discounted by the market rate of interest the difference V - C would represent the present worth of the investment calculated over its lifetime. Each of the three values mentioned above (ρ_a, V/C, V - C) could theoretically serve as a criterion for evaluating investment possibilities. A fourth value to be maximized under optimum investment strategy could be the rate of return on owned capital. Under conditions of competitive general equilibrium all four criteria would lead to the same decision: (1) In long-run equilibrium there are no super-normal profits, hence V = C. (2) For the same reason the

benefit cost ratio V/C = 1. (3) The internal rate of return (ρ_a) would equal the market rate of interest, as would (4) the return (k) to the entrepreneur on equity capital.[6]

The entrepreneur assumedly wishes to maximize the rate of return on his own capital over his planning horizon since this will give him the maximum amount of capital at the end of the period. Lutz shows that: "except under certain rather unrealistic assumptions, maximization of k will always coincide with maximization of V - C, and that in certain circumstances both will coincide with maximization of ρ_a" (42, p. 17).

Constant Rate of Interest on Borrowed Funds. In the simple case of investment in a process involving point input and point output, where revenue varies solely with scale of investment (but eventually at a decreasing rate) and the rate of interest is constant, the four criteria would involve the following:

(1) Maximization of V - C requires that that the discounted marginal revenue due to an additional (discounted) unit of funds invested should equal unity. Expressed another way, the marginal internal rate of return should be equal to the interest rate since if it is above the borrowing rate any addition to investment (even using borrowed funds) will increase its present worth, i.e., add to present discounted value of profits.

(2) Maximization of V/C--the benefit cost ratio--would be achieved when relative increases in V are just equal to the relative increase in C. In other words the marginal internal rate of return must equal the average internal rate of return. This is the case when average internal rate of return is at its maximum.

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[6]Examples of use of all four criteria are cited by Lutz, p. 16.

(3) It is obvious from (2) that maximization of V/C will also maximize ρ_a.

(4) Maximization of k, the rate of return on the investor's fixed amount of capital is the equivalent of maximizing V - C, the present worth of the investment. As long as the internal rate of return on a marginal unit of funds is greater than the going rate of interest the profit rate on one's own capital will increase. Therefore k will be at a high point when the two rates become equal.

Lutz presents a diagrammatic comparison of the four criteria as shown in Figure 1. An investment of OC_2 will maximize V - C and k. Maximization of V/C and the average internal rate of return on the entire amount of capital requires an investment of CC_1. All four criteria will dictate the same level of investment only if the external rate of interest equals the maximum average internal rate of return (42, p. 21).

Variable Rate of Interest on Borrowed Funds. Relaxation of the assumption of a constant rate of interest dictates that, to maximize V - C or k, the marginal internal rate of return be equal to the marginal rate of interest on borrowed capital. In this case the quantity of owned capital will influence the optimum size of investment through its influence on the rate of interest on borrowed funds.[7] The value of V/C will be at a peak when the rate of increase in the average internal rate of return is equal to the rate of increase in the average borrowing rate. The changing rate of interest has no influence on the amount of capital used where the object is to maximize the average internal rate of return.

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[7]Assumed to be an increasing function of the quantity borrowed.

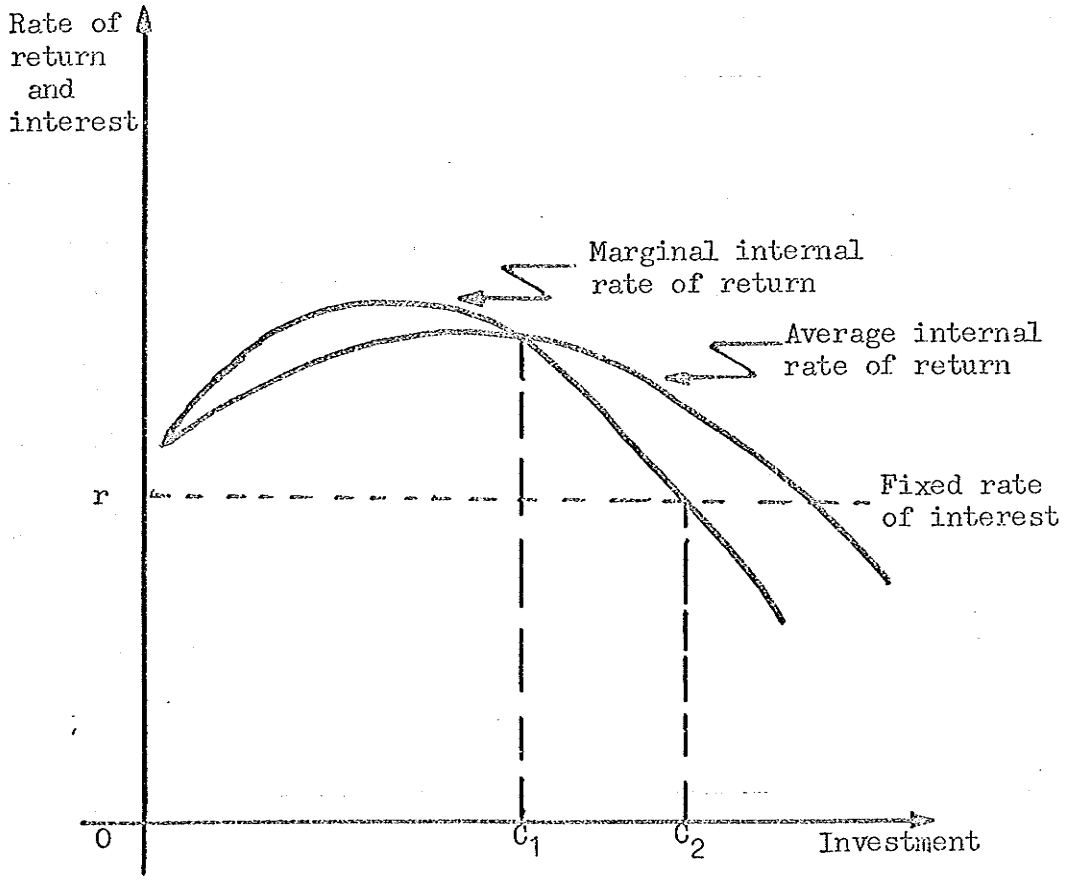

Figure 1. Optimum Capital Investment under Four Profit Maximization Criteria

The foregoing presented investment criteria for a rather simple type of production process and the implications for choice of optimum scale of investment. One would be on sufficiently strong grounds to assume that generally an entrepreneur of the type dealt with in this study would be interested in maximizing k---the rate of return on his own capital over his entire planning horizon. Support for this stand is offered by Lutz who concludes:

> . . .in all the practically important cases, maximizing V - C. . .is a correct criterion to follow, since in these cases this criterion is identical with the criterion of maximizing the rate of return (k) on the entrepreneur's own capital.[8]

Incentives to Investment

The decision to investigate the profitability of an investment is triggered by expectations about the entrepreneur's future profits. Mrs. Robinson mentions two possible ultimate goals: (1) profits for the sake of growth, (2) growth for the sake of profits. She admits to circularity here: the rate of accumulation (or investment) influencing the rate of profit, which in turn influences future expectations of rate of profit---thus influencing the rate of (investment and) accumulation (50). Considering the corporate entity (as opposed to the small family business) one would think that profits for the sake of growth should not be considered an ultimate goal. It is an intermediate one which will allow the firm to reach a competitive position in the industry where it is assured a normal rate of profit

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[8]Ibid, p. 42. For an approach showing that an entrepreneur might choose to maximize V/C, see Alain Barrere, "Capital Intensity and the Combination of Factors of Production," in F. A. Lutz, The Theory of Capital, MacMillan & Co., London, 1961.

in its operation. Growth for the sake of growth can hardly be thought of as a rational economic objective.[9]

Other factors influencing an investment decision include:

(1) Flexibility--Keirstead claims that a smaller experimental investment will always be preferred to a larger one (32, p. 69).[10]

(2) Economies of size or scale may override the desire to enter into new areas of investment gradually. This would be true of highly competitive industries where entry is difficult with inefficient capacity. Where economies of scale are important investment in such processes often leads to increased specialization and higher degrees of uncertainty.

(3) Technological obsolescence may induce new investment. The rate of advance of technology, however, may have a negative influence on the planned durability of long term assets.

(4) Internal liquidity considerations and creditworthiness. In its long term plans a firm may place a premium on borrowing ability. Credit is made available in relation to capital value and profit potential of a firm. A higher rate of (rational) investment means a greater flow of profits and so, potentially, both a greater amount of self finance as well as power to borrow from external sources. Some studies show that a strong preference for internal financing is a prime factor in determining the volume of in-

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[9]Unless the wealth component is specifically introduced. This cannot be done easily in the case of the corporate firm which has a potential eternal life. For the small firm owner a specific wealth target seems a reasonable goal.

[10]G. J. Stigler, in The Theory of Price, Macmillan Co., New York, Third Edition, 1966, argues that firms may actually be willing to make a larger fixed investment in order to achieve short run adaptability to market conditions; cf. p. 130.

vestment in the corporate firm. The main reasons given include disadvantages arising from overextension of an external debt position; historical events which have made outside funds difficult to obtain; hierarchical structures which make outside financing asymmetrically risky for the management group. Since management is divorced from ownership if a debt financed project ends in failure the managers could quickly be fired and lose everything. On the other hand, their potential gain in the event of success is small due to relatively small stock holdings in the company. The argument is basically the same in favour of retention of earnings.[11]

(5) J. M. Keynes saw the overriding factor in investment decisions as "animal spirits."

> . . .a large proportion of our positive activities depend on spontaneous optimism rather than on a mathematical expectation, whether moral or hedonistic or economic. Most, probably, of our decisions to do something positive, the full consequences of which will be drawn out over many days to come, can only be taken as a result of animal spirits--of a spontaneous urge to action rather than inaction, and not as the outcome of a weighted average of quantitative benefits multiplied by quantitative probabilities. Enterprise only pretends to itself to be mainly actuated by the statements in its own prospectus, however candid and sincere. Only a little more than an expedition to the South Pole, is it based on an exact calculation of benefits to come. Thus if the animal spirits are dimmed and the spontaneous optimism falters, leaving us to depend on nothing but a mathematical expectation, enterprise will fade and die; though fears of loss may have a basis no more reasonable than hopes of profit had before (34, p. 161-62).

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[11] J. M. Meyer and E. Kuh, Harvard Economic Studies, Harvard University Press, 1959, p. 17 et seq. This is probably not the case for owners of small, unincorporated family businesses who may have to curtail personal consumption to finance internally both renewal investment and expansion. Their preference for internal financing would probably stem from an aversion to foreign control over assets or intervention in the decision process.

While it may be true that investors decisions are guided by animal spirits and then rationalized with the help of economic principles, the process of investment itself should conceivably fit into some pattern or frame which can be described in fairly general and simple terms. The following section will discuss one such attempt. It is included in this chapter mainly as an attempt to link the concepts which have been discussed with the recursive programming technique which has been employed in this study to simulate the consequences of different attitudes towards saving, investment, and accumulation on the family farm.

How Are Investments Made?

Earlier in this chapter theories were mentioned in which present investment was seen as a function of the level of output and the existing stock of capital or as a function of changes in the level of output. Chenery's "pursuit curve," according to which entrepreneurs attempt to balance capacity against output, was also cited.[12] Koyck (36) using as his point of departure the premise that output (and subsequent income and profits) is the main determinant of investment, developed a model for estimating short and long run adjustment coefficients of entrepreneurs who seek to adapt production capacity to desired output. His model represents a general, simplified description of how investments are made.

Koyck introduced two concepts of capacity: the first represents ideal or desirable capacity--K*--an economic concept derived from a theoretical long run production function or derived cost curve; the second type of capacity--K--represents actual physical or technical (engineering) productive capacity.

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[12] See page 14.

The Model. Assuming producers consciously plan to adjust output to changing market conditions and, on the basis of expectations and the probabilities attached to them, attempt to create productive capacity compatible with the criteria of efficient production, one can develop the model from the following expression:

$$(2.1) \quad K^*_t = f(Y_t)$$

where Y_t represents actual output in period t.

If capacity at the beginning of the period, K_{t-1}, is not identical with optimal capacity a gap exists, $K^*_t - K_{t-1}$, which the entrepreneur should wish to reduce and eventually close completely.

Since complete divisibility does not exist and in most cases instantaneous adjustment is impossible, a lag will occur in movement from existing capacity to desired capacity. Factor limitations in the short run, as well as uncertainty and lack of divisibility, lead to deviations from the expansion path which in turn cause suboptimal profits to be earned. The costlier the deviation from the expansion path, the quicker the entrepreneur can be expected to attempt to rectify the situation by adjusting capacity and resource allocation.[13] When the rate at which adaptation is carried out is relative to the size of the gap, investment in capacity can be described as follows:

$$(2.2) \quad K_t - K_{t-1} = \beta(K^*_t - K_{t-1})$$

where $0 \leq \beta \leq 1$ is the coefficient of adjustment. It measures the proportion of the gap closed during the period t.

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[13] Cf. Louis De Alessi, "The Short Run Revisited," American Economic Review, LVII, No. 3, June 1967, pp. 450-61.

The value of K* can be determined only in a theoretical sense, from the LRAC curve derived from the production function (and with known values of subjective factors such as price and demand expectations). K, on the other hand, is measurable (in the same units used to define capacity).

Substituting (2.1) into (2.2), K* can be eliminated.

$$(2.3)\quad K_t - K_{t-1} = \beta(f(Y_t) - K_{t-1})$$
$$= \beta f(Y_t) - \beta K_{t-1}$$

and

$$(2.4)\quad K_t = \beta f(Y_t) + (1 - \beta)\, K_{t-1}$$

It is easily seen that by substituting appropriate values for K_{t-1}, capacity in period t can be expressed as a function, with decreasing weights, of output in previous periods.

$$K_{t-1} = \beta f(Y_{t-1}) + (1 - \beta)\, K_{t-2}$$

therefore

$$K_t = \beta f(Y_t) + (1 - \beta)\beta f\,(Y_{t-1}) + (1 - \beta)^2 K_{t-2}$$

In the general case of a plant whose initial capacity was K_0, the capacity at period T can be expressed as

$$(2.5)\quad K_T = \beta \sum_{t=1}^{T} (1-\beta)^t\, f(Y_{T-t}) + (1 - \beta)^T K_0$$

where $0 \leq \beta \leq 1$

Long run elasticity of capacity adjustment with respect to output is obtained by dividing short run elasticity by the adjustment coefficient.

The adjustment coefficient is subjectively formed or decided upon by each entrepreneur--probably subconsciously. It reflects his expectations, attitudes to risk or uncertainty, and his reactions to situations and policies which influence his particular industry. It is an important variable for planners to quantify, for in analyses or planning procedures which are based on simulation or optimizing algorithms, it is important to be able to con-

strain the postulated response of the decision mechanism with the aid of some empirically estimated dampers. Otherwise the results may prove unrealistic. Introduction of just such dampers, in the form of flexibility coefficients, in a recursive programming approach to planning of the growth of the farm firm, is discussed in Chapter V.

II CAPITAL ACCUMULATION AND GROWTH--THE FLOW CONCEPT

Thus far this chapter has discussed questions touching on the nature of capital as a production agent and as a source of purchasing power; the creation of capital through investment and use with the human agent; criteria for investment at any given point in time and the behavior of entrepreneurs in adjusting their stock of capital at any given point in time to what they consider to be the desirable volume. It is now time to consider the ultimate result of diverting income from consumption to investment--namely, growth, examining the speed at which growth is achieved and whether the rate of capital accumulation is as important to the individual firm as it appears to be to economies. This in itself is not easy to generalize for firms as a group. The independently owned small family business cannot be likened to a corporate firm which finances part of its operations through equity capital. A firm dependent on the stock market for financing must have a record of growing assets and profits, not only in absolute terms but in relative terms as well, if it is to gain the confidence of investors. A company whose rate of growth of sales, income or profit after taxes does not compare well with other firms in the industry may find it difficult to raise the funds it requires through sale of stock. If this type of situation persists the company may not only stagnate in terms of

income and profits but actually retrogress from its competitive position in the market--ultimately to lose out completely and perhaps be swallowed by competitors. A process of this nature would be most pronounced in industries where significant economies of scale are evident.

Small independently owned businesses which rely mainly on internal generation of capital for expansion or on the banking system as a source of financing do not have to worry as much about their public image. Up to a point they too must grow in order to reach some minimum level of efficiency which, considering the fact that they are price takers in all markets, will allow them to meet costs and provide enough surplus to live on and meet contingencies. These firms can also suffer from rather strong shocks if prices take a turn for the worse or production efficiency declines temporarily. Such events are unpleasant in a business of any size but the smaller the business the more severe the shock, hence the necessity to grow. Even in the event of an increase in profitability, whether due to market forces, productivity or institutional action, the small firm usually will benefit much less than a larger one, simply because its total volume of production is small. Table 1 illustrates the importance of size when the terms of trade decline.

The fall in prices seriously affected both the large producer whose income fell 21 percent and the small one whose net profits dropped by one-third.[14] At the same time savings dropped 33 percent for the big firm where some of the adverse effects could be absorbed by a reduction in con-

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[14] A ten percent increase in production costs would cause a decline of 11.7 percent in the large firm's net income, 23 percent in that of the small producer leaving them with $6,200 and $1,610 respectively. Saving would decline accordingly.

TABLE I

INFLUENCE OF VOLUME OF PRODUCTION ON
NET INCOME AND SAVING

Average Conditions		Large Producer		Small Producer
Gross Product		$15,000		$7,000
Total Costs	60%	8,000	70%	4,900
Net Income		7,000		2,100
Consumption		4,000		1,500
Saving		3,000		600
Unusual Year: Prices decline by 10 percent				
Gross Product		$13,500		$6,300
Total Costs		8,000		4,900
Net Income		5,500		1,400
Consumption		3,500		1,500
Saving		$2,000		-$ 100
Decline in net income unusual year as percent of average		21%		33%
Decline in savings unusual year as % of average		33%		117%

sumption of $500. The average earnings of the small firm only allowed consumption at a level of $1,500 in usual years. When a poor year hit, it was difficult to reduce consumption. In the above example the effect of smallness and a level of subsistence consumption prior to the poor year caused the owner to eat into capital, dissaving $100.

The above could easily represent the situation in agriculture where both prices and yields are given to fluctuation. True, when income declines the large firm suffers, but it is usually much more capable of absorbing a loss than a small firm which can meet its demise if it encounters a series

of poor years.[15]

A firm must accumulate some amount of capital in order to produce. It must grow, even if that growth is a one-time, instantaneous jump from zero to a size which it maintains forever, and, as shown in the cost curve analysis of theory of the firm or in the example above, there are often good reasons for growing larger than the size at which some firms operate. A key motive for that growth is the desire for profit. Mrs. Robinson touches on two factors which are related in determining the desired rate of capital accumulation and searches for the connecting link between them. These factors are:

(1) The expected rate of profit envisaged as resulting from a certain rate of accumulation.

(2) The rate of accumulation which an expected or given rate of profit will induce.

The influence of the expected rate of profit on the desire of firms to accumulate has been mentioned before in this chapter. Valuing the existing stock of capital on the basis of the same expected rate of profit, the plans of the firms can then be expressed in terms of a rate of accumulation. The expected rate of profit will usually be heavily influenced by recent experience. The extent of this influence depends on the nature of the "animal spirits."

The relation between the two approaches can be shown in Figure 2. The curve II shows the rate of accumulation as a function of the rate

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[15] In the following chapter the differential effects of price supports on farms of different sizes will be examined in relation to the effectiveness of government policies aiming at redistribution of income.

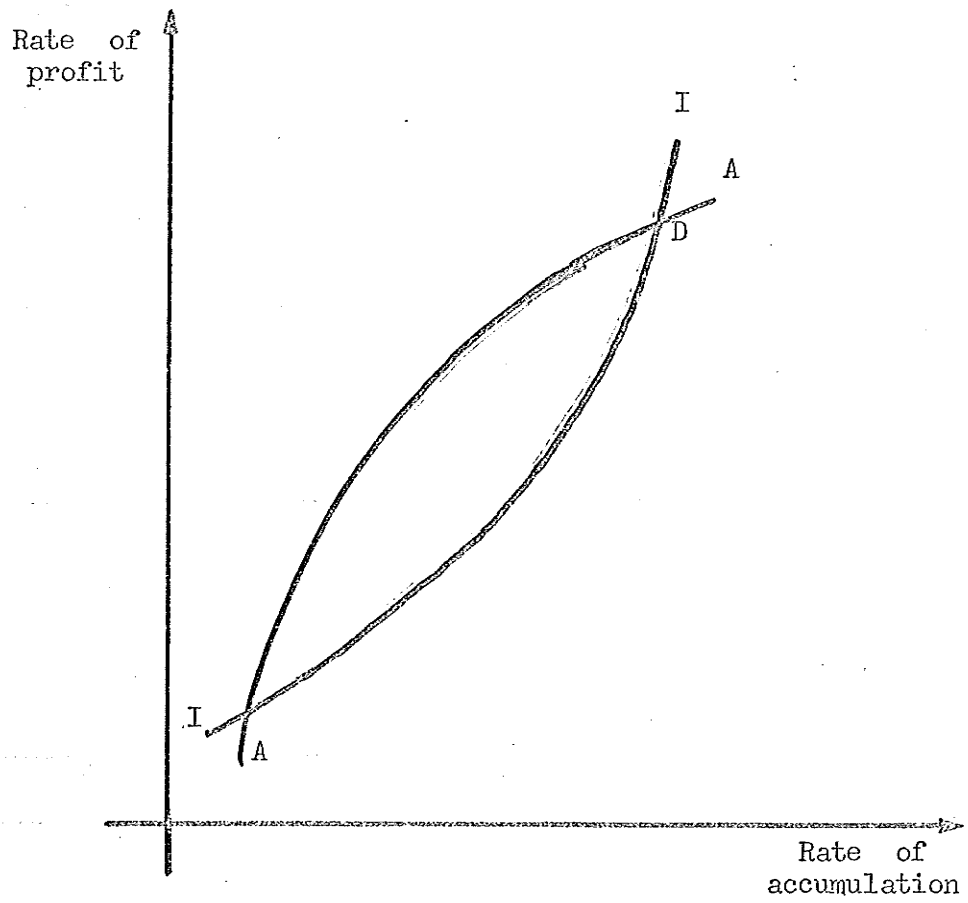

Figure 2. The Desired Rate of Accumulation

of profit which induces it. The second curve AA represents the expected rate of profit on investment as a function of the rate of accumulation which generates it. The point D represents a rate of accumulation which generates just the expectation of profit that is required to cause it to be maintained. This is the "desired" rate of accumulation (50).[16] It is desired, though, more in the sense of some concept of general equilibrium for the economy. If all producers are at point D on their individual accumulation maps, then some degree of stability will have been reached. Age composition of capital can be expected either to remain constant or to change at some rate which can be anticipated. This would make life easier for investors, planners, and policy makers who would have much more certain expectations about the effects of changes in values of exogenous variables on them. One of the most interesting facets of this graphic representation of the desired rate of accumulation was not touched on by Mrs. Robinson. Specifically, why is it that some firms never reach D and what must an entrepreneur do to move there from a point to the left of it? It might be useful to draw on a theory of economic development in order to get some insight into the phenomenon of "inadequate" firm size and questions of what Leibenstein (39) has termed "low level stagnation."[17]

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[16] It would not be difficult to show a fairly close relation between movement along Mrs. Robinson's II curve and the adjustment coefficient estimated by Koyck.

[17] Harvey Leibenstein, Economic Backwardness and Economic Growth, New York, Wiley and Sons, 1957. Most of the following section is a modification of the model developed in his book.

III THE LOW LEVEL EQUILIBRIUM TRAP AND THE MINIMUM CRITICAL EFFORT

Leibenstein developed his model of low level stagnation within the framework of a study of the growth of underdeveloped economies. It is possible, however, to draw certain parallels between macrounits and small, family-owned firms. The analogy between the functions of a small family business and a national economy can be seen quite easily through observation of the family farm. It contains a consuming sector (the family) and a producing sector (the farm); it exports goods to markets outside the farm and imports other goods not manufactured locally. It even has a balance of payments problem. The farmer who refuses to use credit can be likened to a government which will not allow total imports to exceed total exports within a given period. Allocation of net product between consumption and investment is a problem for the farm family just as it is for national planners, albeit on a smaller scale. With this in mind, Leibenstein's model might prove useful in understanding some of the underlying factors governing capital accumulation and growth of the farm firm.

Growth of the farm firm can be defined as increase of productive potential (measured by value of capital) within the enterprise and, as a result, growth in production (specifically net product or net income) and eventually net worth or equity. Growth of the firm is dependent on production of more goods and services than are consumed and allocation of the residual to productive investment, i.e., capital formation.

The relations between income, consumption, and capital formation can be described by the three following equations:

Net income: $Y = g\ (K/S,\ T,\ P,\ W)$

Consumption: $C = f\ (Y,\ S,\ K)$

Capital: $K = L(Y, C)$

where:
C = consumption
Y = net income
K = value of farm capital
S = family size
T = technology
P = product-factor price ratio
W = weather

The above equations show the actual behaviour of the variables in question; therefore they have nothing to do directly with expectations. In this they differ from the approaches taken by Mrs. Robinson and others. Indirectly, though, consumption would probably be affected by estimated investment needs which themselves would be governed by past experience and its influence on profit expectations.

Figure 3 shows the interaction of rates of change of income and consumption and its effect on determination of capital and growth of the firm. The initial segment of the curve depicting rate of change of consumption coincides with the capital axis, indicating a subsistence level of consumption which cannot decline, regardless of capital level (even if it means eating into capital to maintain it) and initially will not grow due to the need to accumulate greater productive potential.[18] As capital accumulates and rate of growth of income increases, consumption can increase pari passu with investment until some level of satisfaction is reached where rate of change of consumption remains relatively constant (39, p.113).

Rate of change of income can be expected to grow initially at an increasing rate, tapering off eventually and, perhaps, even take a downward turn as factors relating to economies of size become effective.

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[18] The full impact of the "morality of the entrepreneur" would be felt here by the farm family (see p. 12).

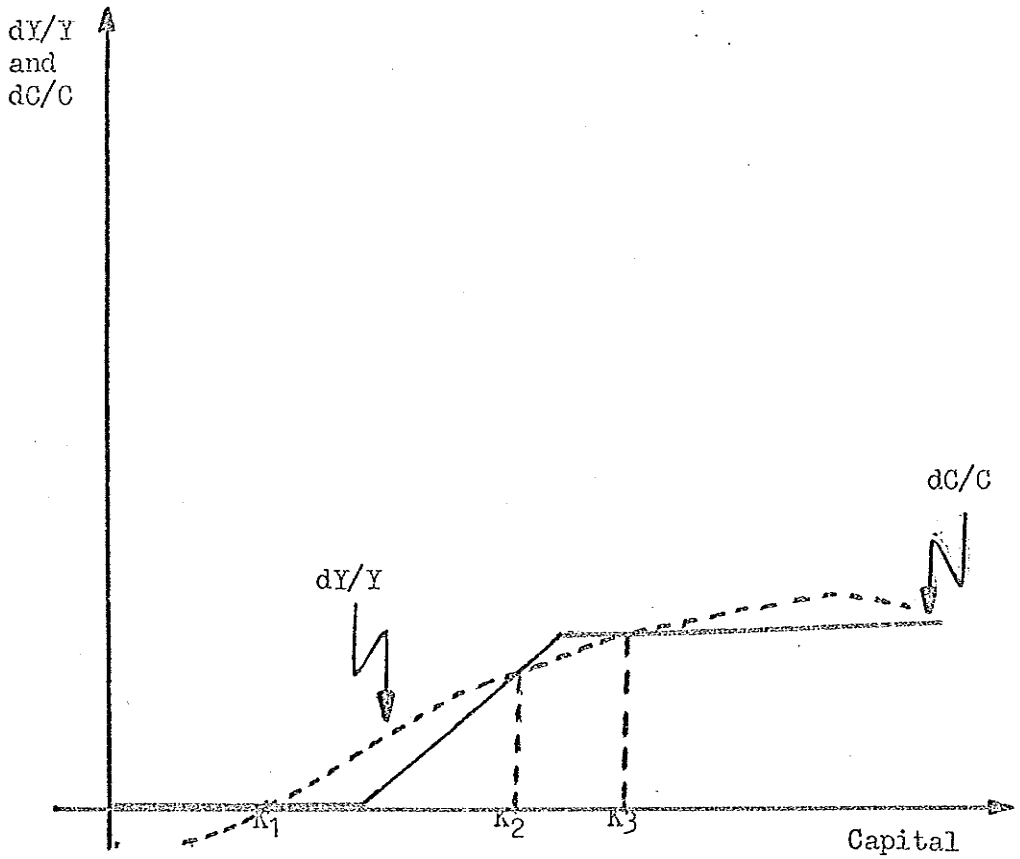

Figure 3. Income Consumption and Growth of the Firm

In this system capital levels are determined by absolute levels of income and consumption, but at the same time rates of change of these two variables will be affected by rates of change of capital in relation to the absolute level at which the change took place. In effect, then, the curves cannot be interpreted as being reversible in the sense that they can be read both from left to right and from right to left. The simultaneity of influence precludes this. The figure must be used more in a manner showing some type of comparative static analysis rather than perfectly dynamic flows. K_2 is a point of equilibrium which will be reached eventually if capital levels vary between K_1 and K_3. The movement will be from K_1 to K_2 as capital grows from the point where production and consumption rates just balance each other, allowing for no saving. A positive rate of accumulation between K_2 and K_3 will be difficult to achieve if a gradual buildup is attempted, for at such absolute levels of income, consumption, and capital there may be a tendency for rate of growth of consumption to exceed rate of growth of income, leaving little or nothing for investment in new capacity. The point K_2, therefore, is a point of stagnant equilibrium, a trap from which the family firm will find it difficult to extricate itself solely by internal generation of capital. What Leibenstein prescribes for an economy which finds itself in this type of trap (where rate of increase of consumption rises faster than income, due to population growth) is a "Big Push." A minimum critical effort is required to shove the economy past K_3 to a state where income grows faster than consumption and continuous growth is possible. This can be achieved by an injection of capital from outside the system. In the case of family farms, K_3 can be attained by employing sufficient credit to reach a size of firm which is less susceptible to shocks such as poor yields, blights, or suddenly depressed prices.

Other measures which might allow a firm to evade the low level equilibrium trap at K_2 include:

(1) Reduction of the propensity to consume, i.e., lower $\frac{dC}{C}$ or, generally dC/dY. This would be a temporary measure, necessary only until capacity reaches competitive dimensions.

(2) Improved management and productive efficiency. This would entail increasing dY/Y or dY/dK.

(3) Expansion of capital through utilization of external sources. In addition to borrowing money, farmers can expand production through rental or through contract farming and vertical integration. What is implied here is movement along the production function and along the abscissa in Figure 3, bypassing the endogenous influences of dY/Y and dC/C.

Use of external sources to escape the low level equilibrium trap is important for the family farm since during its life cycle the period of greatest capital need coincides with that of greatest consumption requirement. If consumption needs are satisfied, business needs may suffer, and if growth of the firm is given priority over family needs and consumption is curtailed, the family may find itself in a forced savings trap in which actual savings are greater than the propensity to save, in a schedule sense. That and more: exaggerated use of credit by the farmer, as a means to force himself to save (through allocation of principal and interest to production cost) will mean low net income, high sensitivity to price and yield fluctuations and a danger of losing part of his capital assets if poor years appear in succession. The nature of the family cycle and its influence on business decisions and growth of the farm firm will be discussed more fully in Chapter IV.

The above section points out various relationships between capital, income, consumption and growth, and the dangers of stagnation in a low-level

equilibrium trap. The problem still remains, though, of how one takes positive measures to build up the kinetic energy to escape the gravitational pull of K_2. In the following pages two approaches will be studied which might answer that question: one, in fairly specific terms, indicates what decision variables are needed and how the information obtained should be processed, the second is a more general description of what in fact may actually guide the entrepreneur in his decisions to maintain or expand capacity.

IV TWO PLANS FOR GROWTH

A. PLANNING FOR GROWTH IN A CENTRALIZED ECONOMY

Trygve Haavelmo (20, Ch. 21), developed a model for determining critical values of consumption and investment in a centralized economy (to which the family farm might be likened) so as to obtain specific economic objectives relating to capital accumulation and consumption.

Assume the following situation:

(1) An economic plan is to be formulated for an intermediate range period. A large amount of capital will be due for replacement before the period ends, but available technologies at that time can be fairly well foreseen.

(2) The majority of the adult population at the beginning will still be present at the end and will be concerned about the economic conditions for some time beyond the end of the period.
This suggests a period of up to about ten years.

Initially a number of economic paths can be chosen:

1. increased consumption;

2. depletion of stocks;

3. decreased consumption in favour of capital accumulation.

It is plausible to assume that planning for the future should be based mainly on adjustment in relation to what was done in the near past (perhaps the previous planning period).

Principal information (even if only indicative) required to formulate a successful plan includes:

1. What is the set of human preferences concerning present and future goods?

2. To what consequences will present economic decisions lead as far as the supply of goods in the future is concerned?

The important variables in the model are:

$x(t)$ = total net output per unit of time
$C(t)$ = rate of total consumption
$\dot{K}(t)$ = rate of capital accumulation
$K(t) = f\,(x(t) - C(t))$ = stock of capital

The first period of the plan is designated as $t=0$, the final year as $t=\Theta$. Known data on which to base planning decisions are $K(0)$, $x(0)$, and the level of consumption just prior to the planning period, designated as $\bar{C}(0)$. The level of consumption in the first period $C(0)$ is a magnitude to be determined within the plan.

Guidelines for determining policy towards consumption should consider the utility function of those affected. However, the idea of utility per se for a given point in time is meaningless and probably should relate to a stretch of time. An idea of a future standard of living may not be conceivable in absolute terms and should be stated in terms of a comparison with present or past standards. With this in mind goals of consumption could be formulated on the basis of the following premises:

1. People would probably be averse to lowering their level of living relative to what had been enjoyed in the past.

2. They might even be averse to a decline in the rate of improvement of their standard of living.

3. Considering the concern for economic conditions beyond the plan period, rate of net output should not be smaller than the rate of consumption at the end of the plan period.

4. People will probably not want to work any harder in the future than they have in the immediate past.

Defining consumption in period t as

$$C(t) = \alpha(t) + C(0) \qquad 0 \leq t \leq \theta$$

the planners are faced with the problem of determining the values of the constants α and $C(0)$ which will lead to the achievement of the planning goals. The constraints limiting their choice of policy are:

$$(1) \quad \alpha(t) + C(0) \geq \bar{C}(0)$$

This is the stipulation that consumption be nondeclining.

$$(2) \quad \alpha(\theta) + C(0) \leq x(\theta)$$

Consumption cannot exceed total net value of production in the last period of the plan. In other words, saving must be non-negative.

$$(3) \quad \alpha \geq 0$$

Changes in rate of consumption cannot be negative. We assume that $x(0)$ $\bar{C}(0)$ and the constraints listed imply that $C(0) \geq \bar{C}(0)$. Possible planning objectives, with respect to consumption might be:

1. Maximum immediate consumption.
2. Maximum average consumption over the plan period.
3. Maximum rate of consumption at the end of the plan period.

It is plausible that the last objective might be the closest to fitting human desires.

Through development of the equations relating to the production function, consumption function, and the resulting capital accumulation function, one can solve a set of differential equations and, on the basis of the solutions (20, p. 118) plot a function delineating the possible combinations of C(0) and α which satisfy the set of inequalities constraining the plan. The possibility region for paired values of the two variables is the triangle $L\bar{C}(0)M$ in Figure 4. From the figure it is clear that the larger the incremental consumption α desired, the smaller must be the lowest upper bound of C(0). If α is set equal to zero, consumption in the first period can equal total net value of production and no saving or capital accumulation will be forthcoming.

The family of curves $\alpha(\theta) + C(0) = \text{constant}$ is shown in Figure 4. Their slope is less than that of the line LM, therefore the combination of C(0) and α which will maximize $C(\theta)$ is that represented by the point L in the figure. This means that, under the assumptions and constraints of the model, if there was a positive rate of accumulation immediately prior to the beginning of the plan, accumulation would continue to be positive and consumption would not make a discrete jump at $t = 0$ but would rise gradually.

The solution indicated by the choice of values for α and C(0) also indicates that accumulation would gradually decline over the planning period until at $T = \theta$ investment would be zero.[19]

Gradual revision of the plan on a period by period basis could provide a higher rate of accumulation if this were an objective. Consideration of the planning point as mobile while θ remains fixed allows the model to be

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[19] This result could be avoided by formalizing the constraints as strict inequalities.

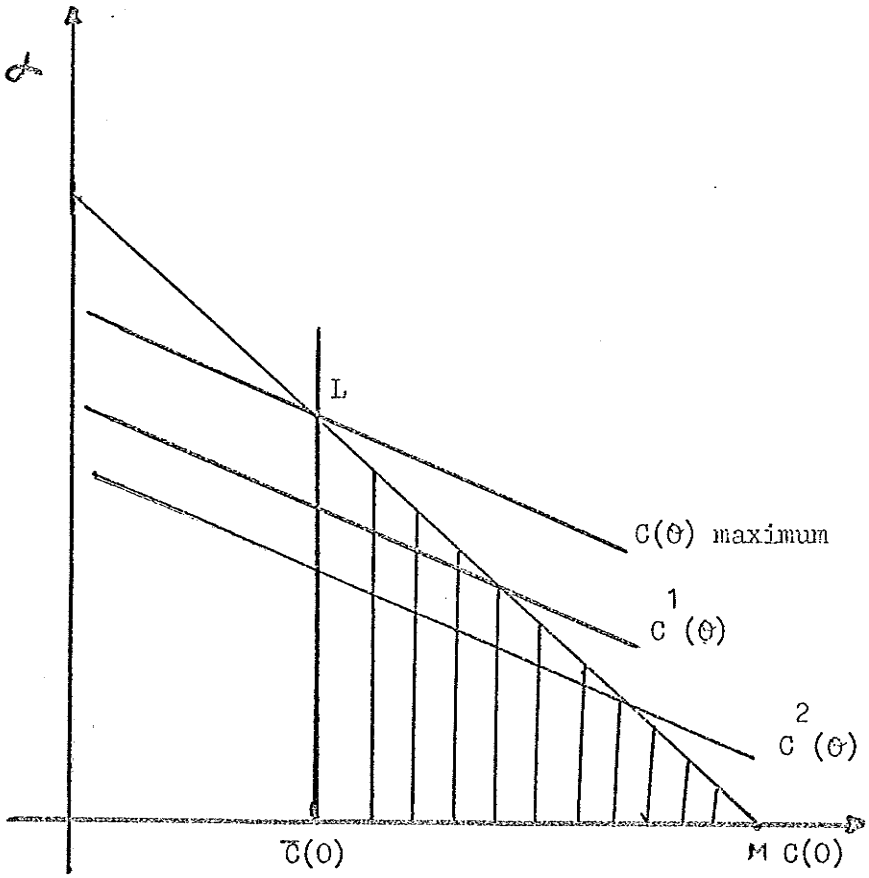

Figure 4. The Possibility Region for α and C(0)

regarded as determining the relevant α for the consumption policy of the immediate future and α could become variable over time.

Haavelmo's model appears quite uncomplicated, providing one can obtain the necessary information on the production function and preferences for capital accumulation and consumption throughout the planning period. It need not be confined to an entire economy but could be used just as well for a sector or, what is more interesting in this study, for an individual farm firm. The values of α and C(0) determined within the model could be inserted into a recursive programming plan as data for flexibility coefficients and constraints and thus supply the farmer with guidelines for fixing his enterprise mix and investment plan for the firm.[20] The two planning devices are complementary and serve to provide the entrepreneur with important information regarding production and consumption decisions necessary to achieve ultimate goals of growth and capital accumulation.

B. PLANNING FOR GROWTH OF THE FIRM

Leibenstein (38) developed a general but very plausible model of the growth of the firm and how it is governed by the entrepreneur's reaction to indivisibility of capital assets and the existence of incomplete knowledge about the industry and its market. His guiding assumption is that, when starting out, the firm seeks a growth strategy which will maximize the rate of return on capital.

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[20] See Chapter V for an explanation of the uses of recursive programming in planning for the farm firm. A number of polyperiod linear programming models reviewed by Irwin (27) include a consumption target either as an absolute amount or as a proportion of realized net income.

Assuming knowledge of the long run cost function for the firm--even if only to a close approximation--firms might not choose at the outset to operate at a scale coinciding with minimum long run average costs. Suboptimal size entails a changing capital stock over time, as well as initial suboptimal income streams. Risk or uncertainty play a crucial part in the final decision. Some types of risk can be reduced by exploration and experience (which have certain costs). These include risk associated with incomplete knowledge of the market and lack of managerial experience and organizational capacity within the firm. The costs associated with exploration and the losses due to lack of complete knowledge generally can be expected to be smaller for a small firm than for a large one.

An entrepreneur entering an industry would tend to discount his expected profit flow for risk and uncertainty. Within limits, the larger the planned operating scale the larger the rate of discount would be. Thus, if the expected rate of profit for various outputs were to take the form of the curve pp in Figure 5 below, with maximum at output Qm, by discounting the profits a new curve p'p' is formed with maximum rate of profit at Qd which is less than Qm. The discount rate is a function of output.

As the firm gains more experience in the industry the discount function can be expected to shift downward and flatten out--causing the point of optimum output on p'p' to move to the right. At the limit the optimum point of output according to the discounted function would tend to coincide with Qm as the discounted function approaches pp. Ex ante, this is the point of long run equilibrium and the firm should remain at that stage of growth until technology, prices or expectations change the shape or position of the rate of profit function.

The locus of points of maximum rate of discounted profit of the

firm on the succession of p'p' curves postulated is the growth path the firm will probably follow in expanding. It should be noted that at any point in the history of the enterprise the entrepreneur can look back on "growth tracks" he has left behind him but at most can see only two points ahead: that immediately before him (based on his latest estimate of p'p') and perhaps the ultimate point of optimum size under conditions of certainty.

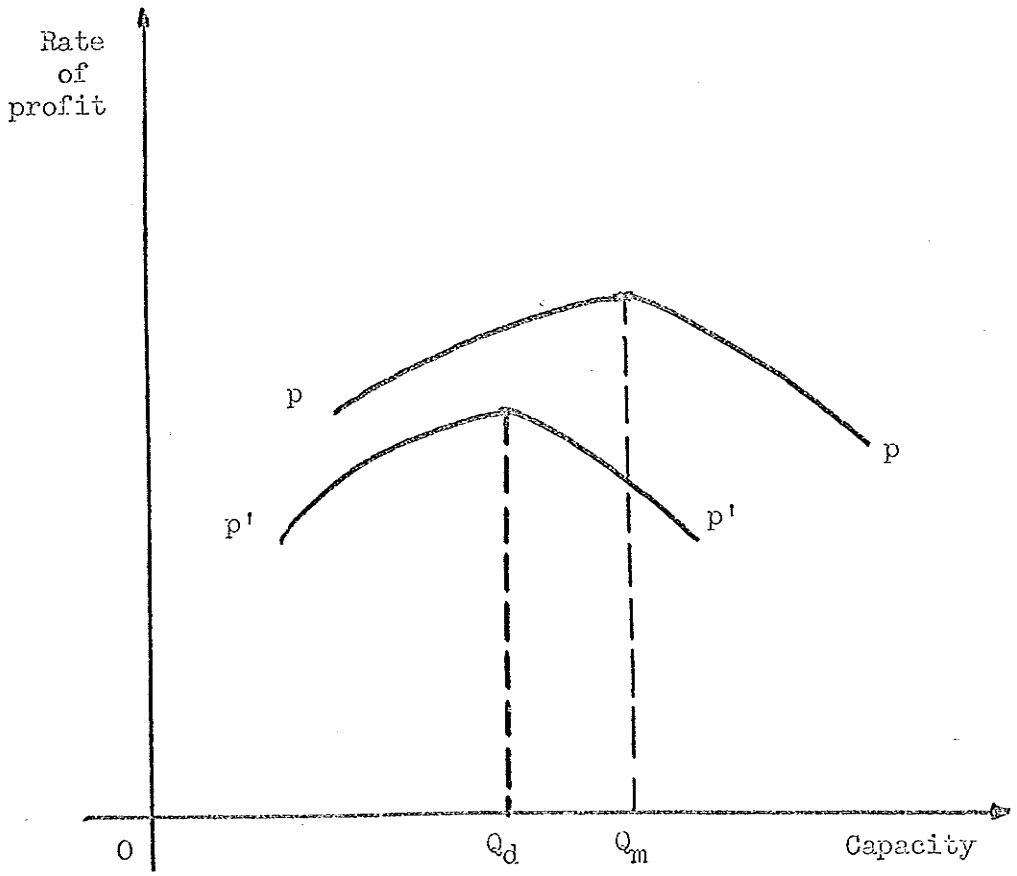

Figure 5. Planned and Discounted Profit Functions of the Firm

The two approaches to growth and accumulation discussed in this section differ considerably. Whereas Haavelmo stressed goals related mainly to consumption, Leibenstein concentrated only on the production aspects of the firm. The first model accepts capital accumulation (resulting from net investment) as a residual whereas the firm growth model assumes that Mrs. Robinson's "morality of the entrepreneur" is the guiding principle, therefore consumption becomes a residual, dependent on desired rates of investment and capital accumulation. Within the family farm probably neither of the two factors can be clearly categorized as dependent or independent variables. As a matter of fact they may alternate as key factors, depending upon the stage in the family cycle in which the firm is found. More will be said of this in Chapter IV.

Both models also seem to be very dependent on economic man--an entrepreneur who carefully plans on the basis of his knowledge of factors governing the operation of the firm and influencing the behaviour and desires of the consuming unit--the family. Little room is made in theory of capital and investment for the "animal spirits" guiding Mr. Keynes' entrepreneur. This is quite obviously proper, for if only animal spirits governed long-term economic decisions, there would not be much need for planners and builders of explanatory economic models. The following chapter will present the results of economic decisions of Canadian farmers with respect to investment, regardless of how the decisions were formulated, and attempt to describe, in the aggregate, how capital was accumulated and what were the effects of changing structure of the industry and general economic conditions in Canada on the purchasing power of the assets employed in agriculture.

CHAPTER III

CAPITAL ASSETS AND CAPITAL GAINS IN CANADIAN AGRICULTURE 1926-1965

The following sections attempt to examine some of the aggregate statistics on production assets in Canadian agriculture between the years 1926 and 1965 and to perform a few preliminary manipulations in order to find some of the basic components of that part of Canada's farm problem relating to capital. The work is guided in part by S.N. Kulshreshtha's study of farm and non-farm incomes in Canadian agriculture (37) and attempts to present data on capital structure and real gains from agricultural capital in a manner which allows comparison with the results of that study.

I. AGRICULTURAL POLICY

In Canadian agriculture, as in that of the United States, the past four decades have been characterized by the development of what T.W. Schultz called "a serious economic squeeze on people in agriculture ... on the earnings of human effort" (54, p.8). This has come about for many reasons, among them the low income and price elasticity of demand for farm products, coupled with a rising level of productivity in the economy, and the changing price relationship between labor and capital goods.[1] Drummond expanded on this, pointing to the preservation

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[1] Kerr (11, p.59) attributed the low level of Canadian farm income and its instability to three factors: deterioration of agriculture's terms of trade, uncertainty and instability of prices and yields and under-utilization and misuse of land, labor and capital.

of an atomistic structure by the farm sector, while many industries from which agriculture purchases large quantities of inputs have reacted to economic stimuli in a manner more characteristic of imperfect competition (11, p.33).

Throughout the period between Confederation and the beginning of the depression, government agricultural policy was guided by a desire for expansion and settlement within the framework of Laissez Faire enterprise. Anderson claimed that this was the basis for the "unquestioned universal support" for the family farm as the basic agricultural unit - an approach which was reflected in many of the major programs for agriculture.

> One of these was the public distribution of Crown Land, which was arranged so as to provide small holdings to private owners; another was the policy of Federal and provincial farm loan agencies, which limited the size of loans to amounts suitable to finance family-sized farm units .... Another effect of this philosophy of freedom of enterprise was that it greatly simplified the approach to income and welfare; the respect for freedom of enterprise, and confidence in the efficacy of free markets resulted in the belief that income, if determined by the market, would be just and adequate. (11, p.70)

The economic hardships which befell the family farm during the depression caused a shift in the attitude of policy makers who, in addition to their declared goals of expansion and efficiency, broadened the spectrum of programs to include assistance and price maintenance. In the main, though, price maintenance and assistance policies still did relatively little for the small farmer in terms of creating conditions which would allow him to raise his income to a level comparable with that prevalent in the non-farm sector. Partial exceptions to this in the Prairies

were the Prairie Farm Rehabilitation Act, which took positive action to improve cultivation practices and conserve soil resources, and debt adjustment legislation, which reduced the total credit burden on Canadian farmers by about one-third (11, p.40).

Explicit social and economic goals enunciated after World War II included full employment, a high rate of economic growth, reasonable stability of prices and an equitable distribution of rising incomes. Improved productivity in some parts of the farm sector contributed to economic growth and helped hold prices relatively stable; however, while doing its share to encourage national growth, agriculture (on the average) appears to have benefitted less than other sectors from the increase in the nation's wealth.

> By 1963, farmers' incomes were 54 per cent above the 1949 level while incomes of wage and salary workers elsewhere in the economy had increased by 90 per cent. Measured in constant 1949 dollars, incomes in agriculture had increased by 13 per cent while incomes in non-agricultural occupations had increased by 46 per cent. If an allowance for a return on capital was deducted from farmers' incomes, the increase in current dollars was 21 per cent, and in constant dollars there was a decline of about 10 per cent. (12, p.22)[2]

Kerr stated that inadequate and unstable farm income permeated the thinking behind changes and developments of policy in the post-war period (11, p.59). The principal measures taken to resolve the

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[2]Annual income to farmers was calculated by dividing the annual estimates of realized net farm income by the annual average number of farm operators as estimated in the Labor Force Survey. This attributes to the farm operator a return for his net capital investment, his management and labor, as well as for that of the rest of his family.

dilemma centered on the price support program, direct subsidies by the Federal and Provincial governments and promotion of producer marketing boards, the Federal-provincial program under the Agricultural Rehabilitation and Development Act (ARDA) and crop insurance plans.

Such government measures serve to improve the position of two large groups of farmers: the first consists of those commercial producers whose scale of operation is sufficient to benefit from price support and marketing programs; the second contains farmers situated in marginal and sub-marginal farming areas with whose problems the ARDA program deals. There is, however, a very large population of farm producers for whom full scale relief actions are not required and yet who benefit only slightly from price supports, marketing boards and crop insurance programs because their scale of operations is sufficiently small to render their incomes relatively insensitive to such measures.

Robinson found that for an operator in the United States, selling between $10,000 and $20,000 of produce, a 10 per cent change in farm-product prices (production costs remaining constant), would result in a change in net farm income of more than 25 per cent. That of producers selling less than $2,500 worth of products would only change by 18 per cent. In other words, in addition to creating a misallocation of resources through distortion of price ratios (both among products and between products and factors), price supports have little effect on

raising the incomes of those who need it most.[3]

Part of the cause for the relative decline in returns to agricultural labor despite its increasing marginal productivity is to be found in the large increase in capital and capital embodied technology on many farms. The competitive nature of agriculture and the relative cost of farm labor has led producers to introduce labor-saving production techniques, and equipment which appears to benefit from increasing returns to size (56). At the same time government policies, tradition and the institutional attitude to agricultural credit have tended to leave many farms too small to take full advantage of the production potential of the equipment at their disposal.

Ackerman and Riecken (1) suggested in 1964 that, to be defined as a "competitive enterprise with a bright future", a farm unit should (1) provide a net income of at least $2,500; or (2) produce at least $5,000 worth of farm products for sale; or (3) command a minimum of $15,000 of capital resources. Table II illustrates how the number of farmers "with a bright future" grew between 1951 and 1966.

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[3] Legislators of the Agricultural Stabilization Act of 1958 appear to have realized that this would be the case. In an attempt to dampen the reverse income distribution effects of price supports, an upper limit on deficiency payments per farm was imposed for certain products. This would have little effect on achieving inter-sectoral income parity though.

Table II

CANADIAN FARMS WITH AT LEAST $14,950 WORTH OF FARM CAPITAL
CENSUS YEARS

Census	1951	1961	1966
Total farms	623,091	480,903	430,522
Farms with $14,950 or more in capital	N.A.	308,253	338,252
Per cent of total	N.A.	64.1	78.6
Farms selling more than $5,000 worth of products	90,954	141,074	192,665
Per cent of total	14.6	29.3	44.8

Source: Calculated from Agricultural Census of Canada, 1961 and 1966.

The proportion of farms with at least $14,950 in capital assets rose sharply between 1961 and 1966. This was due to a reduction of 50,000 in the total number of farms and an increase of 30,000 farms controlling that amount of capital. Indicative, though, that the criterion suggested by Ackerman and Riecken in 1964 was already obsolete in 1966, is the fact that average current value of farm capital assets rose from about $27,400 per farm in 1961 to $44,250 per farm in 1966. The respective figures for those farms labelled "commercial" by the census were $38,700 and $53,187 - growth of between 50 and 60 per cent in each case, over a five-year period.

Anderson stated that Canadian agricultural policy had been based on a belief that increasing physical productivity of resources,

market promotion and price support would improve the incomes of people engaged in agriculture (11, p.76). Probably, it only increased the incomes of some of those people and, in recent years, it certainly did not manage to keep labor income of self-employed farmers abreast of the self-employed non-agricultural industries and, at times, even of agricultural laborers' wages (see Table VI). It is clear that with the changing character of agriculture and its relation to the rest of the economy, a fresh approach to policy is required. Efficient resource use must be emphasized more, treating the causes of malallocations rather than attempting to treat symptoms such as low absolute or relative incomes. Anderson suggests strengthening of programs in four main areas: manpower, land use, regional development and capital accumulation and its financing. Regarding the last, which is the concern of this study, he states:

> In essence, the expanding and changing physical structure of farm capital has come into conflict with the unchanging financial structure of farms, and has created what is commonly called a credit problem. But resolving this incompatibility will extend beyond credit to a comprehensive policy for capital to agriculture, which is not tied to an objective of full ownership of the capital with which a farmer works. (11, p.78).

The following sections will attempt to show trends in the capital structure of Canada's agriculture and relate them to changing production and income.

II. CAPITAL, PRODUCTION AND INCOME

That agriculture is a declining industry in a developing economy can be seen from Table III. Canada's agricultural population declined

over a 35 year period from roughly one-third of the total to less than one-tenth. In absolute terms the number of people connected with agriculture fell 40 per cent from 3.3 million in 1931 to about two million in 1966. During the same period, the number of farms dropped by about 40 per cent while farm lands increased slightly. Accordingly, the average farm in 1966, whose area was 404 acres, was 80 per cent larger than in 1931. Farm consolidation changed the distribution of farm sizes too. New technologies and the labor/capital price ratio have created a demand for larger farms, thus, whereas in 1931, 37% of all farms were smaller than 100 acres and only 6.5 per cent were one section or larger, in 1966 the former had dropped to one quarter of all census farms while close to a fifth were at least 640 acres in size.

Table III

TRENDS IN FARMS AND FARM SIZE IN CANADIAN AGRICULTURE, 1931-1966

Item	Unit	1931	1941	1951	1961	1966
Farm Population	millions	3.3	3.2	2.9	2.1	2.0
Percent of Total	percent	31.7	27.4	20.8	11.7	9.8
Land in Census Farms	millions acres	163.1	173.6	174.0	172.6	174.1
Number of Farms	thousands	723.6	732.8	623.1	480.9	430.5
Average Farm Size	acres	224.	237.	279.	359.	404.
Proportion of Farms						
Smaller than 100 acres	percent	37.4	36.8	34.2	27.3	25.7
101-200 acres	"	32.0	31.5	27.9	26.2	24.2
201-639 acres	"	24.1	24.5	27.8	31.4	31.9
640 acres or larger	"	6.5	7.2	10.1	15.1	18.2

SOURCE: Census of Canada, 1966, Table 2.

TABLE IV

CAPITAL STRUCTURE OF CANADIAN AGRICULTURE, 1926-65

(FIVE YEAR AVERAGES)

Period	Value of Farm Assets				Distribution of Farm Assets			
	Aggregate		Per Farm					
	Current	Deflated 1/	Current	Deflated 1/	Land	Buildings	Machinery	Livestock
	- million dollars -		- dollars -		Per Cent 2/			
1926-30	6,208	4,811	8,582	6,651	53	21	11	14
1931-35	4,640	4,946	6,361	6,781	56	21	13	10
1936-40	4,300	4,236	5,878	5,791	52	22	13	14
1941-45	5,058	3,967	7,123	5,586	47	20	14	18
1946-50	7,009	4,017	10,726	6,147	44	20	18	18
1951-55	9,874	4,296	16,696	7,265	43	19	22	17
1956-60	11,622	4,461	22,298	8,559	43	21	21	15
1961-65	14,891	4,797	33,014	10,635	45	21	19	14

1/ Value of individual components was deflated by appropriate indices and totalled to arrive at deflated value of farm assets.

2/ Components do not total 100 per cent due to rounding.

Capital Structure

Prior to 1929 expectations in agriculture boomed. The 'twenties were characterized by rapid expansion of investment and production, aided by policies which encouraged immigration and settlement. For this reason when the depression and the droughts hit, many farmers found themselves heavily overextended and burdened with debts they had no way of repaying. Through the 'thirties, a process of disinvestment was evident at both sectoral and individual farm levels; in fact, as can be seen from Table IV, in current value terms capital investment did not recover to its predepression levels until after World War II. Aggregate investment in agriculture then proceeded to double in current values within the following twenty years. In constant (1935-39) values though, average aggregate value of farm capital in the five-year period 1961-65 was no greater than for the period 1926-30.

Averages for individual farms, shown in Table IV, clearly illustrate the trends of consolidation (growth of farm size) and land intensification (growth of machinery component, relative to that of land in total capital value). The current investment in an average farm more than quadrupled between the periods 1941-45 and 1961-65. Even in constant terms, capital values of farms almost doubled in twenty years. Simultaneously with expansion mechanization became an important factor; whereas machinery and equipment represented only 14 per cent of farm capital in 1941-45, its share rose to 19 per cent in 1961-65. The proportion of land in total capital dropped correspondingly during the same period.

Farm Income

Value of farm production more than doubled in the twenty years following the outbreak of World War II. At the same time, production expenses tripled. Column 6 of Table V indicates the difficulties encountered in the deterioration of terms of trade for agriculture during the depression and again in the decade between 1956 and 1966. In both of these periods production expenses far exceeded 50 per cent of gross income. In contrast, the interim period appears to have been a relatively profitable one for the sector.

A rough capital-output ratio is found in column 7 of the same table. Of interest are the five-year averages for 1926-30 and 1931-35. The first indicates a relatively high level of capital investment, probably encouraged by the favorable conditions in agriculture immediately prior to the depression. The steep rise in the ratio of capital to gross income indicates the farmers' inability or lack of desire to disinvest when demand for agricultural products declined.[4] The period between 1940 and 1950 was characterized by a fairly low ratio of capital to gross output, however, the trend in the following fifteen years rose

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[4] Table V indicates an apparent disinvestment in farm capital of roughly 25% between the two periods. This however reflects more a decline in the market value of farms and farm equipment than actual disinvestment. In constant price terms (1935-39 = 100) there was actually a slight increase in farm capital from $4.8 billion in 1926-30 to $4.9 billion in 1931-35. On the other hand, while current figures show a decline of only $300 million between 1931-35 and 1936-40, the constant value series indicates a drop of over $700 million -- half in value of land and about half in buildings and machinery.

TABLE V

PRODUCTION AND INCOME IN CANADIAN AGRICULTURE, 1926-65

Period	(1) Total Income Gross	(2) Total Income Net	(3) Cash Income As % of Gross	(4) Production Expenses	(5) Value of Capital Assets	(6) Ratio of (1)to(4)	(7) Ratio of (5)to(1)
	Million Dollars		%	Million Dollars			
1926-30	1,144	532	79	612	6,208	1.87	5.55
1931-35	622	163	75	460	4,640	1.35	7.69
1936-40	865	363	77	502	4,300	1.72	5.00
1941-45	1,593	865	86	728	5,058	2.19	3.22
1946-50	2,415	1,280	88	1,136	7,009	2.13	2.94
1951-55	2,892	1,505	91	1,387	9,874	2.09	3.45
1956-60	3,031	1,172	90	1,858	11,622	1.63	3.84
1961-65	3,706	1,380	89	2,326	14,891	1.59	4.00

SOURCE: Columns 1, 2, 3, 4 and 6 based on Kulshreshtha's study (37) Table XV, page 112 as revised and updated by him on the basis of revised DBS farm income statistics.

steadily -- an indication of increasing capital requirements, accompanied by falling average product prices, both of which apparently moved more rapidly than increasing physical productivity.

It is also interesting to note from Table V that although production expenses and value of capital more than doubled in Canada between 1946-50 and 1961-65, net farm income in current terms rose by only 8 per cent.

Another interesting aspect of the capital-income relationship in agriculture is seen in Table VI. Not only is the return to labor less in agriculture than in non-farm industries, but the return to the labor of self-employed farmers has at times actually fallen below the average wages paid to hired agricultural workers. In those periods where returns to self-employed farmers' labor exceeded wages, this was by insignificant margins. One of the factors responsible for this situation is the residual nature of returns to an entrepreneur's resources. Whereas the wage earner is compensated at some predetermined rate, regardless of an enterprise's operating results, the farm owner must bear the risks and uncertainty of farming while allocating profit which may remain among all factors, including equity capital and unpaid family workers. The magnitude of gross income, and ultimately, of profits depends to some extent on the vicissitudes of weather; hence the high variance of returns to self-employed labor in agriculture relative both to agricultural wages and to returns of non-farm, self-employed workers.[5] However, as pointed out by Kulshreshtha in his study of

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[5] A treatment in depth of these problems is found in Kulshreshtha's study (37, Chapter VI).

TABLE VI

INCOME IN CANADIAN AGRICULTURE AND NON-FARM INDUSTRY PER UNIT OF LABOR 1/ 1926-65

(FIVE-YEAR AVERAGES)

Period	(1) Total Labor Income Farm	(2) Total Labor Income Non-Farm	(3) Ratio (1)/(2)	(4) Unit Wages Farm	(5) Unit Wages Non-Farm	(6) Ratio (4)/(5)	(7) Labor Income of Self-Employed Farm	(8) Labor Income of Self-Employed Non-Farm	(9) Ratio (7)/(8)
	Dollars		%	Dollars		%	Dollars		%
1926-30	243	1,549	15.7	N.A.	1,618	-	N.A.	N.A.	-
1931-35	4	1,198	.3	264	1,310	20.2	N.A.	N.A.	-
1936-40	174	1,347	12.9	327	1,499	21.8	N.A.	N.A.	-
1941-45	579	1,954	29.6	476	1,922	24.8	635	2,212	28.7
1946-50	881	2,678	32.9	806	2,691	29.9	904	2,485	36.4
1951-55	1,274	3,664	34.8	1,185	3,764	31.5	1,353	2,909	46.5
1956-60	1,123	4,488	25.0	1,357	4,554	29.8	1,046	3,804	27.5
1961	889	4,885	18.2	1,433	5,008	28.6	-	-	-
1961-65	N.A.	N.A.	-	N.A.	N.A.	-	1,601	4,236	37.8

1/ The labor unit used as the basis for these calculations was the "Normalized Man Equivalent" (NME), used extensively by Kulshreshtha in his study on income comparisons (37). It adjusts employment figures, allowing for female and child workers as well as for the disparity between hours worked by farm versus non-farm workers. For details see Chapter V of the above work.

SOURCE: Kulshreshtha (37), Tables XVI, XVII and a revision of Table XIX, which was adjusted and updated by Kulshreshtha on the basis of revised DBS statistical series.

income comparison, there are much greater differences in income within agriculture, both regionally and over time, than between agriculture and non-farm industries in general:

> The income of operators was highest in the Prairie region. Along with being higher, incomes in this region have also been very low during the depression.... A chronic lower level of incomes has been observed in the case of the Maritime provinces, which did not suffer comparatively as much during the depression period. Incomes in this region dropped to -$21 in 1931-35, but rose only up to $483 during 1955-60. Quebec, British Columbia, and Ontario can be arranged in an ascending order between the Maritimes and the Prairie provinces. (37, p.131).

Regional Structure of Farm Capital

Just as there exist significant regional differences in operator income, so can regional patterns be discerned in the structure of agricultural capital and its changes over time. Tables VII and VIII show how investment changed regionally between 1926 and 1965 in relation both to the average for the nation (Canada = 100) and to a single year within the period (1940 = 100). Table VII presents index numbers of aggregate values, while Table VIII presents a similar framework, but using figures representing averages per farm operator.

Table VII again shows the relatively high level of agricultural investment in the immediate predepression years represented here by 1926. Only in British Columbia was that level exceeded prior to 1945 as the sector recovered. In all regions except the Prairies and British Columbia the deflated (constant dollar) value of assets had still not recovered by 1965 to the level of investment reached in 1926.

The second half of Table VII indicates the relative magnitude

of agricultural investment by regions. The Prairies have been investing relatively faster than the rest of the country.[6] Consequently, their share of Canada's agricultural capital grew from 46 per cent in 1926 to 56 per cent in 1965. The only other region to increase its share was British Columbia which moved from 3 per cent of total farm investment to 4.5 per cent. At the same time, the Maritimes dropped from 5.5 per cent to a mere 2.4 per cent share of capital in the period 1926-1965. All of this is quite consistent with Kulshreshtha's findings, quoted above. The chronic low level of incomes would mean little ability to invest in growth either from savings or from credit. No growth and an initially small capital base would confine producers to continued low incomes. Hence the decline, not only in the Maritimes' relative share in the capital value of the entire sector (as demonstrated in the index of current capital value where Canada equals 100), but also a drop in absolute terms as expressed by the index of deflated farm capital values (1940 = 100).

Regional Changes in Capital per Farm Operator

The relative position of average regional farms is illustrated for selected years in Table VIII. Here too, the importance of the Prairies can be seen. The current capital value of an average Prairie farm in 1965 was 12.5 times greater than in 1940 and almost double the 1955 value. It is interesting to note that, per unit, Maritime farms have increased in value (either current or deflated) relatively

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[6] Or disinvesting at a relatively slower pace.

INDEX OF AGGREGATE VALUE OF FARM CAPITAL IN CANADIAN AGRICULTURE

REGIONAL ANALYSIS - 1926-1965 SELECTED YEARS

1940 = 100

Year	Current Value 1926	1935	1945	1955	1965	Deflated Value 1/ 1926	1935	1945	1955	1965
Canada	144.7	107.3	132.4	244.7	410.1	116.1	117.4	100.6	110.3	125.5
Maritimes	154.9	112.8	135.5	179.5	192.8	137.1	126.3	93.4	83.9	70.4
Quebec	149.1	107.0	133.0	195.2	259.0	133.7	123.2	98.0	95.1	98.2
Ontario	138.2	97.8	121.8	223.9	363.1	118.5	113.9	91.8	100.9	116.5
Prairies	147.8	114.0	137.1	278.3	514.3	107.1	117.4	106.4	121.1	142.6
British Columbia	123.4	96.0	154.3	326.2	523.2	100.2	104.9	121.6	155.8	185.1

Canada = 100 2/

	Current Value					Deflated Value 1/				
Maritimes	5.5	5.4	5.2	3.8	2.4	6.2	5.6	4.9	4.0	2.9
Quebec	17.5	17.0	17.1	13.6	10.8	18.9	17.2	16.0	14.2	12.9
Ontario	28.2	26.9	27.1	27.0	26.1	29.7	28.2	26.5	26.6	27.0
Prairies	45.8	47.6	46.4	51.0	56.2	42.2	45.7	48.3	50.2	52.0
British Columbia	3.0	3.1	4.1	4.7	4.5	3.1	3.2	4.3	5.0	5.3

1/ Based on 1935-39 prices.

2/ The lower half of this table presents the regional distribution of aggregate value of farm capital. The coloumn for each year adds up to 100 per cent except for rounding errors.

more than those in any region other than the Prairies. The main additions to farm capital were in machinery and land.[7] Thus, it appears that the depressed level of income in the Maritimes has forced those desiring to remain as active producers within the sector both to expand their land base and to increase the level of mechanization. This is exactly what has happened also in the relatively profitable Prairie provinces where the nature of the crops cultivated is such that the size of unit defined as viable or profitable has expanded with time. It is important, however, to note that, although growth trends were similar in the Maritimes and Prairie provinces, the average capital value of a Prairie farm in 1965 was between three and four times greater than that of a farm on the Atlantic Coast and the gap appears to be growing.

III. CAPITAL GAINS IN AGRICULTURE

It is quite obvious that the inferior position of income in agriculture relative to other sectors has not prevented farmers who remained in the sector from investing in land and machinery, and expanding their resource base as well as their volume of operation. The expanding capital base, coupled with declining agricultural prices, is obviously one of the factors leading to the conclusion that farm incomes (returns to labor and management) are not keeping pace with non-farm

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[7] In the Maritimes the constant dollar value of machinery per farm operator grew from $360. in 1926-30 to $1,340 in 1961-65. In the same period land value (in constant terms) grew from $1,232 to $1,814. Comparative figures for the Prairies indicate an increase in value of machinery from $1,458 to $2,994 and of land from $3,948 to $5,877.

TABLE VIII

INDEX OF VALUE OF FARM CAPITAL PER FARM OPERATOR IN CANADIAN AGRICULTURE

REGIONAL ANALYSIS - 1931-65 SELECTED YEARS

1940 = 100

Year	Current Value 1931	1935	1945	1955	1965	Deflated Value 1/ 1931	1935	1945	1955	1965
Canada	170.1	121.8	164.6	348.4	875.7	176.0	133.2	125.1	157.0	268.0
Maritimes	161.2	123.4	189.2	363.5	821.9	179.5	138.3	130.4	169.9	300.3
Quebec	177.4	125.4	162.9	264.5	526.3	205.9	144.3	120.0	128.8	199.6
Ontario	141.9	106.0	146.0	287.4	650.8	158.6	123.5	110.1	129.5	208.8
Prairies	187.6	131.4	173.6	427.6	1,253.8	177.0	135.3	134.7	186.1	347.7
British Columbia	175.5	114.3	160.8	281.2	503.1	167.1	124.9	126.7	134.3	177.9

Canada = 100

	Current Value					Deflated Value 1/				
Maritimes	46.3	49.5	56.2	51.0	45.8	51.1	52.0	52.2	54.2	56.2
Quebec	71.8	70.9	68.2	52.3	41.4	77.7	72.0	63.7	54.5	49.5
Ontario	105.1	109.7	111.8	103.9	93.6	111.8	115.0	109.2	102.4	96.7
Prairies	129.6	126.7	123.9	144.2	168.2	120.4	121.6	129.0	142.0	155.4
British Columbia	112.2	102.1	106.3	87.8	62.5	104.8	103.5	111.8	94.5	73.3

1/ Based on 1935-39 prices.

incomes. Another glance at Table V shows that roughly one-third more capital assets were required to generate a unit of gross income in the 'sixties than in the 'forties. This would indicate declining marginal and average productivity of capital in farming. However, most studies which calculate net farm income impute a fixed return over time to capital, and returns equal to market prices for other productive factors. Returns to labor are then calculated as a residual.[8] There are also agricultural economists who suggest that among the considerations governing farmers' investment behavior is the expectation of capital gains from holding farm property.

Grove calculated the magnitude of capital gains per farm in the U.S. between 1940 and 1959 and compared them to average net income for the same years.[9] He found that in years when capital gains accrued, these varied from 115% down to 5% of net income. In three of the twenty years studied, capital losses were incurred by those selling their assets. There is little doubt that capital gains can be important when realized. Hathaway notes that their influence can be either favorable or unfavorable

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[8]The validity of this method depends on the nature of the production function and its homogeneity as well as on the economically efficient allocation of productive factors within the sector.

[9]His reason for showing this comparison was that "... most would probably concede that capital gains and losses have some bearing on the economic welfare of farm operators and their families, especially owner operators." (19, p.37).

to the owner selling his assets, and that "it is possible for a farm owner who has never enjoyed a high annual income to accumulate substantial assets over his lifetime, and it is also possible for a farmer who has consistently earned a good annual income and reinvested it in his business, to reach the point of retirement and have accumulated few or perhaps no assets." (55, p.55)

The potential effect of capital gains on farm income in Canada can be seen from Table IX. One important fact to note is that, when considering capital gains as annual averages over five-year periods, although these have been positive since 1936-40, they have been much more variable than net farm income, both in the aggregate and when calculated for an average farm operator. Even if capital gains were an important economic factor in the farm owner's decision process (and it will be shown shortly that they should not be), it would be very difficult to plan with any degree of certainty on realizing a specific capital gain.[10] In average terms, someone leaving the sector might have realized an annual loss of $132 or a gain of more than $1,200 depending on when he sold his assets. An "average" operator who had held his farm from the beginning of 1931 to the end

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[10] Of course, in order to realize the capital gains indicated in Table IX, an operator would have to sell his farm and all its associated assets. This is virtually an irreversible act and can have far-reaching effects on the remainder of the farmer's life if his timing is incorrect.

CONTRIBUTION OF CAPITAL GAINS FROM TOTAL ASSETS TO INCOME IN CANADIAN AGRICULTURE, 1926-65

AGGREGATE AND PER FARM OPERATOR

FIVE-YEAR AVERAGES

Period	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Aggregate						Per Farm Operator				
	Total Capital	Net Income	Capital Gain	Total (2) + (3)	Ratio (3)/(1)	Ratio (4)/(2)	Total Capital	Operator's Income	Capital Gain	Total (8)+(9)	Ratio (10)/(8)
	Million Dollars				Per cent		Dollars			Per cent	
1926-30	6,208	532	-299	233	(-) 4.8	44	-	-	-	-	-
1931-35	4,640	163	- 49	114	(-) 1.1	70	7,519	-	-103	-	-
1936-40	4,300	363	110	474	+ 2.6	131	5,682	-	146	-	-
1941-45	5,058	865	277	1,142	5.5	132	8,344	635	453	1,088	171
1946-50	7,009	1,280	684	1,964	9.8	153	10,417	904	1,042	1,946	215
1951-55	9,874	1,505	125	1,630	1.3	108	17,492	1,283	227	1,510	118
1956-60	11,622	1,172	363	1,535	3.1	131	24,672	765	760	1,525	199
1961-65	14,891	1,380	744 1/	2,124	5.0	154	37,538	1,063	1,833 1/	2,896	272

1/ Capital gain represents average of 1961-64.

For explanation of method for calculating capital gains, see appendix 1.

of 1964 would have realized, upon sale of his assets, a total of $21,790.[11] This increase in value of farm assets due to changes in price levels of the assets in question is one of the factors leading to the situation described by Paarlberg and Jacobson (49), who compared farm and non-farm net income and net worth for 1962 in the United States. Their findings were as shown in Table X below.

Table X

INTERSECTORAL COMPARISON OF INCOME AND NET WORTH IN THE U.S. - 1962

	Unit	Net Income	Net Worth
Farm	$	1,430	51,600
Non-Farm	$	2,440	11,581
Farm/Non-farm	%	58.6	445.6

Source: Paarlberg, Don and M.A. Jacobson, "Parity of Net Worth", J.F.E. Vol. 48, No.1, Feb. 1966

The figures in Table X are misleading to some extent, however. Price sensitive assets which represent the capital value of a farm are not all necessarily marketable at the prices or values imputed to them, even when these are based on historic values, depreciation

[11] This represents the sum of average annual capital gains and losses between 1931 and 1964, i.e., from Table IX we have: 5 (-$103 + $453 + $1,042 + $227 + $760) + 4 x $1,833 = $21,790. (The 1961-64 figure of $1,833 was multiplied by four since it represents only an average gain for four, and not five years.)

subtracted and their value then adjusted to account for price changes. Depending on the purchaser, farm buildings such as hog or cattle barns and poultry runs may add no productive value at all to a farm. On the other hand, farm machinery often remains serviceable even after it has been fully depreciated for accounting purposes. Without a doubt it is the land on a farm which is the main determinant of the sale price of the enterprise; whether or not the operator receives adequate compensation for his other assets depends on market conditions and how pressed the buyer or the seller is. For this reason, Table XI has been introduced. It shows land's contribution to farmer's capital gains in Canada between 1926 and 1965. A comparison with Table IX will show the importance of land in potential capital gains of Canada's agricultural sector and what this means in terms of the average farm operator. In the four year period 1961-64 rising land values contributed about two-thirds of the average annual potential capital gain of close to three-quarters of a billion dollars. In the period 1951-55 average annual capital gains from land were close to $140 million, while capital gains from total capital (land, buildings, machinery and livestock) amounted only to $125 million. In other words, changes in price of the remaining capital components actually reduced the potential gain from land by close to ten per cent. In terms of benefits to the average individual farm operator, the two tables indicate that of the $21,790 capital gain between 1931 and 1964, close to $11,000

was due to appreciation of land.[12]

In an analysis of capital gains, as in one of farm income or in intersectoral comparisons of economic indicators, averages often conceal far more than they reveal. This was illustrated exceptionally well in Kulshreshta's comparison of farm and non-farm incomes. One of his most significant findings was that one cannot discuss meaningfully average income figures for agriculture in the aggregate. Inter-regional differences are in many cases greater than intersectoral disparities, as is variability of income. The following section will examine the capital gains regionally.

Regional Distribution of Capital Gains in Agriculture

Regional differences in capital gains to farm operators are influenced by demand for products grown in a given region, mobility of farmers likely to wish to withdraw from the sector, availability to potential buyers of sufficient credit at acceptable terms and, of course, size of farms being bought and sold. In aggregate terms, the regional share of total agricultural capital is also an important factor in the regional distribution of capital gains.

If the average for Canada is considered as 100, the relative share of each region in aggregate farm capital and the relative size of an average census farm would be distributed as in Table XIII.

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[12] Almost half of the $10,816 increase in land values of the "average farm" accrued in the four years between 1961 and 1964.

CONTRIBUTION OF CAPITAL GAINS FROM LAND TO INCOME IN CANADIAN AGRICULTURE, 1926-65

AGGREGATE AND PER FARM OPERATOR

Period	Aggregate (1) Land Value	Aggregate (2) Net Income	Aggregate (3) Capital Gains	Aggregate (4) Total (2)+(3)	Aggregate (5) Ratio (3)/(1)	Aggregate (6) Ratio (4)/(2)	Per Operator (7) Land Value	Per Operator (8) Operator's Income	Per Operator (9) Capital Gains	Per Operator (10) Total (8)+(9)	Per Operator (11) Ratio (10)/(8)
	Million Dollars				Per cent		Dollars				Per cent
1926-30	3,321	532	-176	356	(-) 5.3	67	N.A.	N.A.	N.A.	-	-
1931-35	2,583	163	- 73	90	(-) 2.8	55	4,187	N.A.	-132	-	-
1936-40	2,928	363	+ 16	379	+ 0.7	104	2,928	N.A.	22	-	-
1941-45	2,385	865	131	996	5.5	115	3,931	635	215	850	134
1946-50	3,083	1,280	265	1,545	8.6	121	4,667	904	403	1,307	145
1951-55	4,204	1,505	138	1,643	3.3	109	7,455	1,283	244	1,527	119
1956-60	5,015	1,172	183	1,355	3.6	116	10,640	765	392	1,157	151
1961-65	6,781	1,380	517 1/	1,897	7.6	137	17,126	1,063	1,274 1/	2,337	220

1/ Capital gain for 1961-65 represents an average of 1961-64.

SOURCE: Column (2) - See Table IV ; column (8) - See Table V . Remaining columns calculated from D.B.S. revised series on value of farm capital.

TABLE XII

INDEX NUMBERS OF CURRENT VALUE OF FARM CAPITAL FOR SELECTED YEARS

CANADA = 100

	Per Cent of Aggregate			Per Farm Operator		
	1945	1955	1965	1945	1955	1965
Maritimes	5	4	2	56	51	46
Quebec	17	14	11	68	52	41
Ontario	27	27	26	112	104	94
Prairies	46	51	56	124	144	168
British Columbia	5	5	5	106	88	63

The table demonstrates clearly that the main direction of agricultural activity is westward. The share of Maritime provinces in total agricultural capital dropped from five per cent to only two per cent between the end of World War II and 1965. Quebec lost roughly one-third of its relative share in that same period, while the Prairies increased the value of their investment from 46 per cent of the total to 56 per cent.

Average capital values per farm operator showed similar tendencies over the same period. Relative to the national average, Maritime farms shrank in size from 56 per cent of the average in

1945 to 45 per cent of the average in 1965.[13] Quebec, Ontario and British Columbia also showed a drop in relative investment values whereas the average farm operator on the Prairies increased his capital from 124 per cent of the average in 1945 to 168 per cent in 1965.

Let the above serve as a background for examining the capital gains of farm operators during the period between 1931-35 and 1961-64. A comparison of capital gains and net farm income is found in Table XIII.

Table XIII reiterates for the regions of Canada what Table IX demonstrated in the aggregate. Capital gains, either in absolute terms or as a per cent of farm income, are extremely variable. In the Maritimes they fluctuated from a low of $35 per operator (six per cent of income) to a high of $470 (192 per cent of operator farm income). Capital gains in Ontario during the 'forties were roughly twice as high as those in Quebec. During the same period capital gains were proportionate to Ontario's higher net income. Thus capital gains, as a proportion of income were about equal in the two provinces. After 1950, however, capital gains in Ontario became much more important than in Quebec. In absolute terms, capital gains in the Prairies have always been important, averaging more than $1,000 per year since 1946. In most years their relative magnitude in any given region was proportionate to the relative

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[13] Actually 1945 was the year in which Maritime farms reached their relative maximum. They climbed from a size 46% of average in 1931 to slightly above half average size in the late 'thirties and early 'forties from whence size again declined, in relative terms, returning in 1964 to its 1931 average.

TABLE XIII

FARMERS' INCOME AND CAPITAL GAINS FROM FARM ASSETS IN CANADA, 1931-65

PER FARM OPERATOR - BY REGIONS

(FIVE YEAR AVERAGES)

Period	Maritimes		Quebec		Ontario		Prairies		British Columbia		Canada	
	Income	Capital Gains	Income	Capital Gains	Income	Capital Gains	Income	Capital Gains	Income	Capital Gains	Income	Capital Gains
	Dollars											
1931-35	- 21	39	-104	- 16	- 85	- 9	-406	-254	28	-205	N.A.	-103
1936-40	64	75	58	197	141	194	148	103	282	130	N.A.	146
1941-45	198	253	262	262	597	532	866	581	737	421	635	453
1946-50	245	470	363	522	815	1,104	1,429	1,508	631	941	904	1,042
1951-55	577	35	595	104	736	260	1,922	326	962	264	1,283	227
1956-60	452	320	417	285	581	859	929	1,109	628	742	765	760
1961-65 1/	409	324	339	376	617	1,276	1,694	3,933	748	649	1,063	1,833

1/ Capital gains average calculated on the basis of 1961-64, not 1961-65.

SOURCE: Income figures revised and updated by Kulshreshtha from his study of farm incomes (37), revision of Table XXV, page 132.

size of the average farm in that region, as was farm income.

Table XIV

INDEX NUMBERS OF FARM CAPITAL, AVERAGE ANNUAL NET INCOME AND POTENTIAL CAPITAL GAINS PER FARM OPERATOR

(CANADA = 100)

	Farm Capital		Farm Income		Capital Gains	
	1945	1955	1946-50	1956-60	1946-50	1956-60
Maritimes	56	51	27	59	45	42
Quebec	68	52	40	54	50	37
Ontario	112	104	90	76	106	113
Prairies	124	144	158	121	145	146
British Columbia	106	88	70	82	87	88

Table XIV is very important as an illustration of how wrong it would be to formulate a single strategy to guide the development of agriculture throughout the country. Farming appears to have totally different characteristics in the Maritimes and Quebec than it has in Ontario or the Prairies. For example, average investment per farm there is about half the national average and declining (see Table XII).

That this is not merely a question of a different type of agriculture, requiring different levels of capital can be inferred from the farm income index numbers - Maritime farmers obtained only 27 per cent of

the national average in 1946-50 and still only 59 per cent of the average ten years later. One would expect that such a situation would depress the price of farm assets, creating a buyer's market. The last two columns of Table XIV bear this out -- indicating that capital gains are below what could be expected judging solely from the relative capital value of Maritime farms. In the Prairies, on the other hand, agriculture appears to be successful and expanding. Average farm size in 1955 (as measured in current capital values) was almost 50 per cent larger than the national average; income, too, was higher than average (although in the period 1956-60, not as high as might be expected). Capital gains on the Prairies exceed that region's relative proportion of capital, indicating that there is demand pressure influencing prices of agricultural assets. From the same table it appears that, on the average, Ontario and British Columbia may have attained an equilibrium level where income and capital gains are proportionate to the level of investment.

IV. REAL GAINS AND THEIR RELATION TO CAPITAL GAINS

Thus far the discussion has centered on what has been termed "conventional income" on the one hand, and capital gains on the other. The difference between the two is generally sufficiently clear and need not be discussed. It is sufficient to note that in order to realize capital gains the farmer must sell his assets. In addition, the income gained due to changes in price levels between time of purchase and time of sale would probably have to be discounted for uncertainty at a high rate, if it were to be included as part of the income stream of an investment. This is obvious from the figures on magnitude and variation of capital

gains in Table IX and others. One additional point which must be examined here is the question of the purchasing power obtained through realization of capital gains. In other words, assuming that a farm operator or entrepreneur does not have a money illusion, he will be concerned not with the number of dollars and cents which the sale of an asset yields him, but rather with the potential control over other goods obtained through the sale of an asset.

The importance of the concept of real gains rather than capital gains is best illustrated by a farmer who purchased 100 acres of land for $50 an acre some time ago. Now, he finds he no longer wishes to farm in his present location and puts his 100 acres up for sale. He soon discovers that potential buyers are willing to pay him $100 per acre and he is overjoyed, for this means that he has reaped a capital gain of 100 per cent on his investment. His joy, however, is short-lived for he very quickly discovers that he must bid at least $100 per acre for land in the new location to which he wishes to move. Thus, in terms of land purchasing power, although he has made a capital gain of 100%, he has no real gain whatsoever. He can sell 100 acres and buy exactly 100 acres of equally fertile land.

Assume, now, that the farmer decides not to change his location, but considers retiring. He is advised to wait for a while because prices of farm assets appear to be rising -- and so he waits another year. Now he discovers that the price of his land has risen to $106 per acre. Once again he is overjoyed, but once again his joy is short-lived because in the financial pages of his newspaper he discovers that the Cost of

Living Index has risen 5.5 per cent in the course of the year. Thus, although his capital gain for the year would indicate a return of six per cent on his investment, in actual fact he has made a real gain of less than one-half of one per cent. Real gains, therefore, must be measured in terms of the market in which the capital (or nominal) gains are to be spent.

Calculations of Capital Gains and Real Gains

Capital gains and real gains (or losses) from agriculture were calculated in this study, using the method developed by David H. Boyne (6). Both the methodology and the technique for separating a change in current dollar value of a group of assets into price and quantity components is set down with precision and clarity by Boyne, and there is no need to repeat them here. For this reason only the very basics of the method will be presented to facilitate understanding.

The value, V, of a group of assets is a product of its price, P, and quantity, Q. Denoting two adjacent time periods with the subscripts 0 and 1, we can express the difference in the current value of a group of assets, between two time periods as:

$$V_1 - V_0 = P_1 Q_1 - P_o Q_o$$

Using a Taylor series expansion of the function V = PQ, we can divide the change in current value into its price component (capital gains or inflation) and its (physical) quantity component. The component which has been studied thus far is the price component, representing capital gains as measured by Grove (19, pp. 37-42), Hathaway (55, pp. 51-76) and Johnson (55, pp. 127-144).

Friedman defined income as the amount a consumer can consume while keeping his wealth intact. The examination of real gains and losses entails finding the amount by which the current dollar value of an asset must change during a period in order to maintain exactly the purchasing power of the investment at the beginning of the period. This is calculated by multiplying the value of the asset at the beginning of the period by the change, during that period, in an appropriate price index. (The question of what constitutes an appropriate index will be discussed later.)

Having determined the price component of a change in asset value as the difference between the total current value change and that portion of the change attributable to changes in the physical quantity of the asset, the real gain or loss from an asset can be expressed as the difference between the price component of the value change and the current dollar value adjustment necessary to maintain the asset's purchasing power. "In effect, this procedure adjusts the price component of total current dollar value change for any increases or decreases in the value of money. The residual, then is attributable to a change in the size of the expected future income stream or to a change in the discount rate." (6, p. 33) The specific formula used, the indices employed to develop the constant dollar series of capital values, and the time series of quantity and price components and real gains and losses are presented in Appendix 1.

Regional Analysis of Real Gains from Farm Capital

A comparison of capital gains and real gains per farm operator

from capital assets in agriculture is given in Table XV. In all periods except the depression years 1931-35, and in all provinces, capital gains exceeded real gains -- often by several hundred per cent. This and more; in the five-year period 1951-55 throughout all regions of Canada the average annual capital gain was positive while the real gain was actually negative; i.e., there was a real loss in the purchasing power of agricultural assets. Average annual losses in that period ranged from $218 per farm operator in British Columbia to $296 in the Prairies. The average loss throughout Canada exceeded $200 per year. In Quebec there were only three five-year periods between 1931 and 1964 in which farmers could have experienced any real gains at all. However, for Canada in general, the average annual real gain per farm operator usually exceeded $100. In the period 1961-64 it exceeded $1,000. This, too, is a misleading statistic though, for the regional averages for the Maritimes and Quebec were actually negative (-$83 and -$10 respectively), real gains in British Columbia averaged only $140 and in Ontario $408. It was the average of $2,798 for the Prairies during this period which influenced the national average so much.[14]

Real gains, similar to capital gains, can only be realized through sale of farm property. This does not mean that using real capital values, caused by greater increases in the market value of farm assets than in other relevant prices, can not influence farmers' decisions on

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[14] This real gain of $2,798 is 10% of the average total asset value per farm operator on the Prairies during that same period.

TABLE XV

COMPARISON OF CAPITAL GAINS AND REAL GAINS AND LOSSES FROM FARM ASSETS IN CANADIAN AGRICULTURE

REGIONAL ANALYSIS 1931-64

(FIVE YEAR AVERAGES - PER FARM OPERATOR)

Period	Maritimes		Quebec		Ontario		Prairies		British Columbia		Canada	
	Real Gain	Cap.Gain/ Real Gain	Real Gain	Cap.Gain/ Real Gain	Real Gain	Cap.Gain/ Real Gain	Real Gain	Cap.Gain/ Real Gain	Real Gain	Cap.Gain/ Real Gain	Real Gain	Cap.Gain/ Real Gain
	$		$		$		$		$		$	
1931-65	185	0.21	210	*	309	*	67	*	77	*	174	*
1936-40	15	5.00	115	1.69	47	4.17	- 36	*	9	14.29	28	5.26
1941-45	29	9.09	- 51	*	19	25.00	328	1.79	189	2.22	128	3.57
1946-50	62	7.69	48	11.11	308	3.57	378	4.00	104	9.09	237	4.55
1951-55	-189	*	-150	*	-198	*	-296	*	-153	*	-218	*
1956-60	11	33.33	- 21	*	218	4.00	605	1.82	439	1.69	290	2.63
1961-64	- 83	*	- 10	*	408	3.13	2,798	1.41	140	4.55	1,050	1.75

Note: Real gains and losses calculated on the basis of the Farm Family Living Index.

* Undefined. Either capital gain or real gain is negative.

consumption, saving and investment even though they are not transformed into realized profits through a market transaction. Boyne contends that a real gain of $1,000, although unrealized, can reduce savings by $1,000 and increase consumption out of conventional income by that same amount. This would occur in the case of a farmer who sets himself a target rate of saving or an annual amount by which he wishes to increase net worth. Since the purchasing of his assets has grown by $1,000, there is no need for him to forego present consumption of $1,000 that year. This implies, however, that when there occur unrealized real losses, a farmer will curtail his consumption and save a compensating amount out ofconventional income in order to maintain the desired rate of growth of net worth. Similarly, when real gains are characterized by such a high variance (also an important characteristic of farm incomes) it is quite likely that unrealized real gains (in the short run, at least) will have little effect on consumption and saving patterns of farm owners. In the long run, and in terms of ultimate sale value of their property, farmers probably include an appreciation factor in the assessment and estimation of their future net worth. This, in turn, could conceivably affect the level of annual saving decided upon by individual farm families.[15] However, if the findings of studies such as those by Heady et al in 1953 (22), and Nielson in 1962 (48), still hold true, then one of the main determinants of farm family saving is the goal of complete ownership. If this, in fact, is a main objective (rather than a desire to accumulate a sufficient re-

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[15] If, indeed, it is the ultimate net worth upon retirement which serves as the major determinant governing farmers' saving habits. There are indications that farmers may save more than they would like to, due to farm requirements of replacement and technology.

tirement fund, i.e., a predetermined purchasing power) than unrealized real gains will have little effect on the consumption and saving habits of individual farmers.

V. EFFECT OF CHOICE OF INDEX ON THE MAGNITUDE OF ESTIMATED REAL GAINS FROM ASSETS

What is the correct index to use to calculate potential real gains from agricultural assets? The answer is the economists classical standby: "It depends". Since real gains are defined in terms of purchasing power, one must first determine what will be bought with the proceeds of the sale in order to find what the real gain is.

In this study, three simplified possibilities were postulated: First, proceeds from the sale could be used to continue in farming. In such a case, one of reinvestment in the farm business, a close approximation of real gains could be obtained through use of the composite index of farm costs. Secondly, the assets might be sold upon retirement and the seller remain on or near the farm, thus incurring living costs whose changes are represented by the index of costs of farm living. This then would be the appropriate series to employ to estimate real gains under such conditions. Finally, income from the sale of assets may serve to finance retirement and a transfer of the seller and dependents away from rural living and into an urban area. In this case, a useful index would be one indicating changes in the cost of urban living index. Its use would provide an indication of real gains or losses incurred due to purchase and sale of agricultural assets at specific points in time for the ultimate

purpose of financing city living upon retirement.[16]

The three indices mentioned above were employed in the analysis of real gains and losses from assets in agriculture and the respective results were compared in Table XVI. From the table, it is immediately obvious that there is no constant relationship among the three sets of results. Thus, for example, although for the five year period 1926-30 all indices show real losses in all five regions of Canada, in the periods 1941-45 and 1961-64 this identity of signs is missing, even for a given region (e.g., Quebec). Similarly, no single index can be shown to provide results consistently higher or consistently lower than the others. The unfortunate implication of this finding is that, at least within the framework of the three indices chosen, no single one can be used as an indicator or as a means of indicating a trend or characteristic movement in the economic position of farmers who have disinvested, relative to the rest of the economy. This in turn points to the shaky ground a legislator would be on, were he to attempt to formulate a broad, general law relating to the treatment of capital or (preferably) real gains and losses.

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[16]It could be argued that this last index is invalid for the purpose of this study since the initial investment was in the agricultural sector, hence any calculations of gains or losses must relate to the same sector. Use of the proceeds of any sale in another sector and subsequent gains or losses because of it might be construed as transfer costs among sectors, not validly chargeable to conditions within agriculture. This may be the case but is not germane in the present context since the purpose of this section is to indicate that choice of index can have far-reaching effects on the conclusions and policy implications of an analysis of this type.

TABLE XVI

EFFECT OF CHOICE OF INDEX ON MAGNITUDE OF REAL GAIN FROM AGRICULTURAL ASSETS - PER FARM

REGIONAL ANALYSIS 1926-64

(FIVE YEAR AVERAGES)

	Maritimes			Quebec			Ontario			Prairies			British Columbia		
Period	Composite Farm Costs	Farm C.O.L.	Urban C.O.L.	Composite Farm Costs	Farm C.O.L.	Urban C.O.L.	Composite Farm Costs	Farm C.O.L.	Urban C.O.L.	Composite Farm Costs	Farm C.O.L.	Urban C.O.L.	Composite Farm Costs	Farm C.O.L.	Urban C.O.L.
1926-30	-79	-74	-151	-221	-211	-380	-256	-244	-431	-367	-334	-531	-134	-109	-255
1931-35	145	151	174	210	219	263	243	256	303	54	55	165	61	62	150
1936-40	3	16	20	122	145	155	16	49	62	-49	-35	-25	- 5	7	15
1941-45	18	28	123	-58	-40	120	- 2	23	242	288	267	271	177	158	163
1946-50	66	49	94	73	48	117	349	307	413	403	338	553	148	91	277
1951-55	-180	-180	-183	-187	-187	-192	-223	-220	-235	-298	-288	-271	-169	-161	-147
1956-60	4	16	73	-38	-21	63	189	221	369	343	449	340	454	561	455
1961-64	-31	-61	57	-31	-12	142	280	316	594	1,480	1,500	1,683	244	174	355

VI. SUMMARY AND CONCLUSIONS

Agriculture throughout the ages and in most parts of the world was always considered more a way of life than simply a way of making a living. It was surrounded by an aura of romanticism and judged to contribute to purification of the soul through proximity of the farmer to nature and his dependence on his own physical effort as well as on a benign attitude of the supernatural forces governing weather and fertility. Farming in North America, specifically within the framwork of the family farm, has long been considered to be one of the cornerstones of democracy and almost a necessary condition for the preservation of the cherished freedoms of society.

In the past, the family farm has been utilized as a tool of public policy. Gilson indicated that in western Canada the homestead provided the necessary base for development of the transcontinental railway system and the expansion of commerce generally in Canada (17, p.9). Anderson also suggested that maintenance of the family farm as the basic agricultural unit was a means for achieving the social goal of full employment: "... there has been no unemployment in agriculture. This situation was achieved without any explicit manpower policy because agricultural policy encouraged agriculture to remain an industry of owner-operated family farms". (11, p. 73)

The results of the analysis in this chapter return us to the point made by Anderson and quoted earlier, that Canadian agriculture must resolve the conflict between the expanding and changing physical

structure of farm capital and the unchanging financial structure of farms. He too sees this as more than a simple credit problem but one of a broader policy for capital to agriculture, not tied to an objective of full ownership.

Unfortunately, the information found in the tables presented heretofore is mainly of a symptomatic nature. Diagnosis, which brings with it an indication of curative policy measures, would require much deeper analysis than that permitted by the aggregate figures available here. However, the symptoms themselves indicate areas where further probing may prove fruitful.

Kulshreshtha pointed out in his analysis of farm and non-farm income that there exists more than a problem of maldistribution of income between agriculture and other sectors. He showed that there are greater inequalities among regions in Canada within agriculture itself, than between agriculture and the restof the economy. This study has shown that there is a strong correlation between the capital base within a region and level of income. However, no causation or definite functional relation can be shown at a regional level, mainly because of the heterogeneity of farming even within a single province or region. It would be useful to disaggregate available figures and analyze them on the basis of both farm type and farm size with respect to production efficiency and capital required to produce an "acceptable"level of income.

From tables IX and XI there appears to be no clear correlation between level of net income and capital gains (although from Table XIV it is obvious that, on a regional basis, demand pressure is in the direction

of those provinces where income is highest). This would indicate that capital values on the market are not dictated solely by the income potential of the farm but by other factors as well. A study clarifying this point and explaining the mechanism which operates to determine market values, could be useful in the formulation of a successful farm credit policy. Kulshreshtha analyzed farm income under the assumption that it was a residual, after all other factors had been paid according to market prices. The present study added to Kulshreshtha's by indicating the magnitudes of real gains from capital in agriculture. Neither of these is sufficient to explain the continuation in agriculture of large numbers of farmers who earn even less (and in many cases much less) than the averages cited here. A study relating to returns to capital from all sources, could prove useful in shedding light on the situation.

Inadequate and unstable farm income -- whatever the source may be -- is only symptomatic of some organic disorder within the industry. The trends of consolidation and intensification evident from the statistics indicate that adjustments to market conditions are taking place, however, at an insufficient rate perhaps. They tend to create intrasectoral disparities which, although not necessarily unhealthy in themselves, become problematic when mobility of people and resources is limited. A study is required which would deal with questions of mobility of people and resources within agriculture and between that sector and the rest of the economy. What are the causes of overcapacity and low current income in agriculture? Is mobility the key factor, or

one of the key factors, or is it perhaps itself only a symptom of some deeper disorder? What remedies must be applied to lower existing barriers to free movement of resources and to allow for adjustment of overall capacity to production requirements?

Government policy in the past two decades has aimed at achieving higher resource productivity and accelerated economic growth while attempting to obtain some degree of price stability and an equitable distribution of the rising national income. The studies mentioned above can help formulate a useful policy by providing information relevant to evaluation of the future of farming and its subsectors. They will also facilitate drawing up of extension and training programs both for those remaining in agriculture and those who wish to transfer out of it. Coupled with other technical and economic information the results of such research can be used to draw up individual farm and family plans and the creation of efficient, therefore, viable business units. In the course of these activities it should be possible to increase farmers' appreciation of the contribution which use of credit can make in the realization of their goals.

The government might well consider striving towards expansion of the concept of supervised credit both in its own and in private credit agencies. This might well be done within the framework of judging creditworthiness with more emphasis on production potential than on attachable equity and physical security.

Encouragement of banks, insurance companies and other potential sources of farm credit to expand the staffing of their agricultural lend-

ing departments and raise the level of technical and economic knowledge of the personnel employed could lead to better adjustment in size, type and methods of operation of customer farms who benefits from close supervision. Such fuller understanding of the nature and needs of modern agriculture should ultimately lead to the necessary reconciliation between the financial and technical structure of the farm business, hence to an accelerated movement in the direction of an improved sectoral structure and, ultimately, to a more efficient inter-industry allocation of production resources. A major adjustment which will have to be made in this context is in the attitude of policy makers and farm families to the nature of the family farm, of which it has been said that "one of the greatest limitations of the agrarian philosophy, and much of agricultural policy in Canada, is the belief that somehow the family farm can, and should be preserved in its present form". (17, p.32) The following chapter attempts to explore some of the concepts embodied in the institution of the family farm and to explore the hypothesis that the family farm unit as it has been known in the past is no longer suitable for fulfilling the policy goals of efficiency, high productivity and desirable income distribution.

CHAPTER IV

THE FAMILY FARM

I. AGRICULTURAL FUNDAMENTALISM AND AGRICULTURAL POLICY

The family farm played an important role in the geographic and economic development of North America. The unique social, moral, and economic makeup of rural farm communities, which endowed them with many of the characteristics considered to be desirable by those who came to settle here, placed the family farm in a privileged position. Feelings in some quarters are so strong that at times it would appear that this institution is somehow immune to change in a world where technology, economic structures and even moral values appear to be in a constant state of flux. James W. Robertson's romantic definition of farming as "gathering sunshine, forging wealth out of chaos--gathering and humanizing into wealth for the service of the race the great unused powers of nature" is indicative of the strong emotions attached to agriculture. He states that it is "one of the great fundamental occupations, and therefore the interests of the men who follow it are worth conserving" (44, p. 14). Perhaps because of the close relation to ideas of God, Nature, Democracy, and Rustic Beauty those assigned the task of conserving the interests of the men who follow farming have often been constrained in their search for solutions to "The Farm Problem" by the idea that any agricultural policy must be executed within the framework of the original concept of the family farm. The following quote from an official of the U.S. agricultural extension service is illustrative of just how inviolable the family farm may be:

> We believe the farm family holds a unique place in our society. The farm, the home and the family are inseparable. Every meal is a meeting of the board of

> directors. Here discussions are made that affect the economic, cultural, and social well-being of every member of that family. These discussions influence the part every member plays in making that farm and home an integral part of the life of the community in which he lives. . . .(47, p. 1363).

According to the same official this concept and the development programs which are based on it are "almost unanimously accepted by administrators, subject matter departments, legislators, and farm families" (47, p. 1364).

Sociologists, writing less than two decades ago, for example, Wilson Gee (13) and Loomis (41), pointed out a number of advantages inherent in the family farm. They included:

1. the opportunity for a man to be his own boss, i.e., it offers independence;

2. longevity--both farm men and women have been shown to live significantly longer than similar groups in cities;

3. more equal distribution of wealth than in urban society. On the average a city person will die poorer than a farm dweller;[1]

4. relative effectiveness in molding the sentiments, personality, and characters of its members as compared with nonagricultural families;

5. lowest rates of family disruption and divorce compared to rural nonfarm families and urban families;

6. greater power to overcome adverse conditions, due to the solidary interaction pattern of the family;

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[1] An interesting comment relative to this point is made by Wilson Gee who claims that farming as an occupation seems to be able to bear more abuse through unintelligent operation, than any other business, yet return a living to the farmer (13, p. 134).

7. the various views and values which characterize industrial workers, capitalists, and managers may be combined in a single farm family.

Although, with the development of transportation, improvement of communications and changing of educational systems, some of these advantages may be less obvious today than in earlier periods, the characteristics associated with rural farm communities in the past are still held in high regard within the value system of North American society. Perhaps the persistent devotion to the ideal of the family farm as it functioned in the earlier history of this continent is a manifestation of society's desire to maintain traditional values which appear to be in the process of being abandoned as man enters the age of the computer, automation, and megalopolitan living.

It is, of course, up to society to decide whether it wants to set as one of its goals the preservation of the family farm.[2] However, if policy is set within the framework of the family farm not because this is the proclaimed objective of government but simply due to inertia or sentiment, then preservation of this unit as a tool for accomplishing ultimate goals must be examined using the same objective criteria as are applied to test other means.[3]

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[2]W. J. Anderson suggests that maintenance of the family farm as the basic agricultural unit was not only a goal of policy but a means for achieving the social goal of full employment: ". . .there has been no unemployment in agriculture. This situation was achieved without any explicit manpower policy because agricultural policy encouraged agriculture to remain an industry of owner-operated family farms." (11, p. 73).

[3]Gilson states that in western Canada the family farm (homestead) provided the necessary base for development of the transcontinental railway system and the expansion of commerce generally in Canada. He claims, however, that whereas at that time it was regarded as a tool of public policy, during more recent periods there has been a tendency to regard the family farm as an end in itself (16, p. 9).

Most definitions of the family farm include the consolidation of management, ownership, and labour supply in the farm operator and his family. Other qualifications include a sufficient resource base to provide an "adequate" level of living and reasonably secure tenure (16, p. 4). Such requirements tend to bracket the farm between some loosely defined upper and lower limits, which on the upper side at least, take no account of possible economies of scale.[4] According to some projections (4), whereas roughly one quarter of the farmers in the United States have an average of $120,000 in productive assets, by 1980 half of the farmers will have $150,000 in capital and the top ten percent (earning above $40,000 annual gross income) will have investments averaging $325,000. It is doubtful that such farms will meet the requirements of present accepted definitions of the family farm. Furthermore, commercial enterprises of this magnitude probably would not lend themselves to the forms of organization now generally practised by farmers who find themselves and their farm businesses subject to the biological vicissitudes of the family cycle. A major problem in this context is the necessity to refinance the firm's capital once each generation.

II THE FAMILY CYCLE AND FACETS OF FAMILY LIFE AFFECTING FARM DECISIONS

The family cycle is not unique to the farm family, but it bears special significance for the farm family inasmuch as farm business decisions are influenced by the state of the cycle through which the family is passing, and stages of development of the farm can be traced to stages in the cycle(22).

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[4] For a thorough discussion of the definitions of a family farm see H.V. Walker, "Economics of Farm Size in the Carman Area of Manitoba" (56, pp. 84-88).

The first stage of the cycle finds the young farmer between the ages of 20 and 30, either working with his father on the parents' farm or just beginning on his own.[5] The main problem is to establish a farm of economic size. Usually credit is important, farm income and consumption are low, and vulnerability to risk is high.

In stage II the family is growing. Consumption increases and competes with investment needs for farm income. The labour contribution of the children is relatively insignificant. Credit needs may be even larger than in stage I and vulnerability to crop losses and death are greater because of the possible size of debt and the number of dependents.

Between the ages of 40 and 55 the operator and his family are in stage III. Education needs become important and the labour contributions of the grown children only partially offset the additional financial burden. Some of the children begin leaving home and the family must decide who will remain and eventually take over the farm from the father.

Stage IV is the period which ends with retirement of the father. The question of financing the retirement years is a critical one. The answer to it will determine how transfer of ownership and management of the farm will be made and financed. Problems of division of the farm among sons, possibly creating a number of units none of which is economic, must also be considered.

Stage V is identical with stage I, but removed one generation.

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[5]This description follows Gilson (16, p. 6, ff.). Loomis (41, p. 81, ff.) relates the family cycle to labour supply, pointing out that its influence is greatest when labour is relatively more important than machinery on the farm. The stages of the cycle according to Loomis are: (I) childless couples of child-bearing age; (II) couples with children--the oldest of which is under 14 years; (III) oldest child is between 14 and 36; (IV) old families.

Pervading the entire life history of the farm family is the desire to obtain full title to the farm and its assets before retirement (48, p. 69; 22, p. 384). Two factors are important in determining the capital value of a farm. Initially the question of efficient size is paramount in effecting allocation of net income (Mrs. Robinson's idea of profits for growth). Later in the life cycle, the need to accumulate a retirement fund takes precedence over efficiency criteria. The desire for independence and security of ownership in the face of uncertainty limits credit use. Efficiency of allocation of resources becomes of secondary importance. In any stage of the cycle, equity and subjective discounts due to uncertainty of income limit the farmer's use of borrowed capital. "The independence of the farm business and farm household (including preferences of families) creates a cycle where the quantity of capital employed parallels the cycle of the farm family" (22, p. 384). Heady and his co-workers found that in Iowa capital investment in the farm, expressed as a function of age of operator, could be described by a quadratic function opening downwards, with a peak at about age 47. Accumulation of capital allowed greater flexibility in enterprise combination as the farm grew. In earlier years of the cycle, when capital was relatively short, emphasis was placed on investment in machinery and production of cash crops. Later investment was channeled into livestock production (22, p. 403).

In the same study average productivity (as opposed to marginal productivity) of resource use was examined.[6] It was found that productivity of labour was higher in the early stages of the life cycle than in the later ones

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[6]The analysis was based on the assumption that Euler's theorem applied to the production function, that is, that the function was homogeneous of degree one.

and that the amount of operator's labour also went through a cycle, more being employed relative to capital in the later than in the earlier stages. Capital productivity rose slightly between the ages of 25 and 35, declining continuously thereafter until retirement (age 65) when it was about 25 percent of the maximum level achieved at age 35. This can be explained by increasing amounts of capital relative to other factors and, as the retirement period approached, employment of assets in areas of low monetary income and in the attainment of nonmonetary objectives (22, p. 404, ff.).

It was found that at the beginning of the cycle, when equities were lowest, the majority of operators refrained from using long-term (real estate) credit. Most debts were incurred for operating capital. The percent of farmers incurring real estate indebtedness increased through stage III. However, as equity was built up farmers did not press their borrowing to the limits of equity. Instead, attempts were made to retire debts and to increase investment in nonfarm assets to help secure income during retirement (22, p. 419).

The majority of farmers in the study gave security or retirement as their main goals in farming. Other objectives included independence, ownership, a home for the family. About three quarters of the farmers expected to retire on accumulated property and earnings from it, rather than outside investments. This has very serious implications when coupled with a desire for full title to all assets. As capital requirements in farming grow a distinct gap will develop between the quantity of capital necessary for efficient production and the amount of equity capital required to satisfy the retirement needs of the operator. The influence of this set of circumstances on the social and economic structure of agriculture and the family farm within it will be far-reaching. As expressed by J. K. Galbraith:

> For let there be no mistake, an agriculture where the average unit has a capitalization of a half million dollars or upward will be very different. . .from the agriculture to which we are accustomed. Not many can expect to start with a small, modest stake and control a half million or million dollars of capital during their lifetime. If these are the capital requirements of the successful farm we shall have to accept as commonplace the separation of management from ownership (quoted in 17, p. 50).

It rapidly is becoming necessary that farm families realize the difference between desirable and attainable goals; while an objective of achieving full ownership over assets and total independence in management is clearly desirable from the point of view of individual security, capital requirements of modern technology are fast turning this into an impractical and unattainable goal. Examination of other organizational forms of business--mainly corporations--indicates that managers there have long ago given up the idea of inseparability of ownership and management. Similarly, within corporations it is not generally true that the investor is also the source of savings, whereas in agriculture a large proportion (although perhaps declining of late) of investments are internally financed by farmers themselves. It is also usually the case in corporate enterprises that levels of capital accumulation achieved by previous managers tend to be perpetuated by their successors. This is facilitated by the separation of identity of laborer, manager, and capital owner. Identity of ownership of particular capital goods remains obscure; so obscure, really, that transfer and inheritance have little or no effect on organization of production. Additionally, capital is secured for reinvestment by withholding income (profits) before it becomes available for consumption through distribution of dividends (48).

III CORPORATE AND FAMILY FARM MANAGEMENT AND INVESTMENT DECISIONS

The corporate manager should theoretically be guided in his investment decisions by criteria such as those developed by Lutz (see chapter II), tempered by considerations of uncertainty and imperfect knowledge in a fashion similar to that developed in Leibenstein's model of growth of the firm (38). The firm would be expected to have a relatively smooth growth path over time or, at least, a monotonic capital accumulation path. Main investment actions and adjustment to expected output would ideally be constrained only by limitations dictated in the money market. Certainly the corporate firm is under no direct influence of the consumption needs or retirement requirements of the families of its managers and workers. Inexperienced, incompetent,and aging personnel can be released and the firm's decision making unit rejuvenated by the injection of employees and decision makers who bring new ideas and vigour to the business. Capital investments and growth should therefore be determined by considerations of technology and market conditions.

The corporate world, though, does not apparently react in a robot-like manner to changing price ratios and market structures, according to some omnipresent urge to maximize profits. Theoreticians have turned from postulation of profit maximization as the prime corporate motive to more general objectives such as utility maximization since the former appears too narrow to encompass the full scope of modern entrepreneurial motives. In this context flexibility appears to be an important objective (45, p. 9 ff.). The typical entrepreneur usually desires not only larger profits but also protection against uncertainty, expressed in the structure of the firm's balance sheet.

Volume of investment in corporate companies is governed to a large extent by considerations of internal liquidity and a strong managerial preference for financing through internal means whenever possible. In addition to the financial disadvantages arising when the firm extends its external debt position (52), the hierarchical structure and motivations of corporate management make outside financing asymetrically risky for the established decision makers. In corporations, since management is divorced from ownership, if a debt-financed project backfires and ends in failure the managerial group could readily be replaced and lose everything. On the other hand, if the project is successful their potential gain is small due to their relatively small stock interests in the firm (45, p. 17 et seq.).

Farm managers appear to be similar to corporate managers with respect to internal rationing of credit. In one study of Indiana farmers nearly two-thirds of the farmers were classified as demonstrating internal capital rationing, although in some cases the self-imposed limits were due to self-recognized limitations of management abilities. Only ten percent had reached the threshold of external capital rationing and had obtained all the credit their lenders would extend (24). Reasons given by some farmers for internal credit rationing included age, general aversion to debt, and sufficient income and security to operate without going into debt. None of these would be valid reasons within a corporate firm.

In the family farm the period of highest capital needs coincides with that period in the life cycle where consumption needs are greatest and income is lowest. Conversely, as savings accumulate and equity builds up the possibilities for profitable use of increasing capital diminish due to the operator's aging and decline in labour productivity as well as his desire to avoid enterprises where, although potential earnings may be large so is

the variability of income or the uncertainty attached. Thus, as opposed to the continuous or, at least, nondeclining growth of the corporate firm, the farm firm is characterized by the parabolic path of capital value found by Heady (22), reaching a peak at that point where the children begin to fit into the interaction pattern of the enterprise and contribute to its operation (41, p. 79). In a study of white owner and tenant farms in North Carolina Loomis found that more land was employed or farming became more intensive as family size increased and at the same time a smaller proportion of the family budget was spent on the farm business (41, p. 83 et seq.). Hesser and Jensson (24, p. 9), found that among the Indiana farmers whom they studied there was a significant correlation between operator's age and net worth as well as between age and the farmer's own estimate of the optimum investment in the farm business.

The problem of perpetuation of the business entity and transfer of management have already been mentioned. A father who has been dependent upon the enterprise for his status and authority has difficulty in relinquishing control. In North America economic wastage in the agricultural sector is tremendous simply because there is no institutionalized practice whereby a child may take over at least some portion of the farm operation when the father's ability, strength, and "animal spirits" begin to decline.[7]

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[7] For a more detailed discussion of the economic, social, and institutional problems involved cf. Gilson (6), Heady et al. (10) and Spitze (12).

IV THE FARM FIRM AND ITS NEEDS IN THE FUTURE

It has been said that "one of the greatest limitations of the agrarian philosophy, and much of agricultural policy in Canada, is the belief that somehow the family farm can, and should, be preserved in its present form" (17, p. 32). Technological developments in the past two decades have expanded productive potential and raised the economic size of farm firms as mechanization has increased farm labour productivity and expanded the volume of agricultural production. This has also necessitated specialization of production which increases risks taken. Agriculture is changing from a way of life to a way of making a living (7). Developments in mass communication and transportation are ending the rural community's isolation from urban ideas and values. Rising demand for commercial and public services is causing a transfer of functions, once located in the home and village, to large centres. The necessity for more farm children to seek employment in occupations other than farming is also undermining the social and economic unity of the farm family and dividing its interests.

Gilson (18) suggests that a family farm in Canada in 1977 will have a total capital investment of over $100,000, produce a gross output of about $50,000, and have a current operating expense of $30,000. Two-person partnerships might require close to a quarter of a million dollars in total assets and $55,000 in annual operating expenses. The farm would produce a gross output of close to $100,000.

Baker and Tweeten (4) estimated capital requirements on farms in the United States in 1980. Their estimates were based on a linear extension of the 1950-63 trends evident in development of capital needs; they are shown in Table XVII.

TABLE XVII

ACTUAL CAPITAL INVESTMENT FOR 1930, 1950, AND 1963 AND PROJECTED CAPITAL TO 1980 BY SELECTED TYPES OF COMMERCIAL FARMS IN THE UNITED STATES

Farm Type	Actual Requirements			Projected
	1930	1950	1963	1980
	Current Dollars			
Dairy Farm--Central Northeast				
Total Capital	11,200	23,800	43,400	69,031
Capital per man-year	6,120	14,167	28,366	46,021
Capital per acre	170	191	239	302
Hog-Beef Fattening--Corn Belt				
Total Capital	31,580	54,210	98,920	157,348
Capital per man-year	19,374	37,930	64,653	104,899
Capital per acre	180	280	428	564
Cash Grain--Corn Belt				
Total Capital	34,380	62,410	137,020	234,588
Capital per man-year	22,920	56,736	123,461	213,262
Capital per acre	169	280	471	626
Winter Wheat Farm--Kansas				
Total Capital	28,150	58,000	110,320	178,738
Capital per man-year	22,341	61,702	114,917	178,738
Capital per acre	50	87	136	180
Cattle Ranch--Intermountain				
Total Capital	33,410	70,080	95,550	128,857
Capital per man-year	18,876	45,804	55,877	75,788
Capital per acre	27	42	54	68

Source: Structural Changes in Commercial Agriculture, CAED Report 24, Center for Agricultural and Economic Development, Iowa State University, April 1963, page 31.

The authors suggest that about $116,000 invested in assets is needed to provide an average farm labour return of $5,000. Gilson (18, p. 19 et seq.) supports this with information from Manitoba farm records which show that an average investment of between $55,000 and $65,000 is required to obtain a net farm income of $5,000. This represents a return to both capital and unpaid family labour.

Increased capital requirements of the future agricultural firm as suggested above imply a necessity for improved managers and management techniques; farmers more and more will have to invest in their own education, hire consultative services, avail themselves of market and production information and computers to process these into farm plans for production and development of the firm. Here again the differences in value systems between farm and nonfarm communities, so apparent to sociologists less than two decades ago, will tend to disappear. Under such circumstances farmers will be less willing to accept a standard of living lower than that of urban professionals and skilled workers.[8]

The implications of these developments for future farm organization, transfer arrangements, finance and management have been discussed at length by various authors (3, 4, 16, 17, 18). Without a doubt, as farming becomes more commercial and industrial in nature it will no longer be true that farming as "a way of making a living" can bear more abuse through unintelligent operation, than any other business, yet return a living to the farmer (13, p. 134).

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[8] In the U.S. in 1962 average income for farmers was reported to be $1,430 while that for nonfarm families was $2,240. Average net worth of farm families was $51,600 compared with $11,581 for nonfarm families (18, p. 24).

Meticulous farm records and budgets, coupled with hiring of management services and consultants will be as necessary for the firms of the agricultural industry as they are today for other businesses. And as modern management techniques and methods of production become commonplace, so will the nature of ownership, management, and investment and their interrelations have to undergo a far-reaching metamorphosis.

CHAPTER V

RECURSIVE LINEAR PROGRAMMING: AN AID IN THE EXPLANATION OF CAPITAL ACCUMULATION IN THE FAMILY FARM

Shortcomings of Conventional Approaches to Family Farm Analysis

Chapter two reviewed some aspects of various theories of capital and investment. As shown, such expositions dealt meainly with macroeconomic units--national economies--or with corporate firms. Until recently very little had been published on investment and capital accumulation by small unincorporated firms such as the family size farm. It is difficult to believe that such an omission was due only to negligence on the part of economists in general and agricultural economists in particular. Agricultural economic journals, as well as many professional books for many years have carried studies concerned with problems of the economic efficiency, growth, and security of the family farm in North America. Questions of resource allocation at all levels of the industry and the economy have been studied in depth with the aid of many analytical methods ranging in approach from the sociopsychological (22), through the arithmetic-economic (5), to the highly sophisticated mathematical approach of econometrics and simulation (58). The major stumbling blocks to discovering what makes the unincorporated family mechanism tick economically have been:

(a) The complexity of the dynamic interaction of sociological, psychological, and economic factors involved, i.e., the invalidity of narrowing an analysis down to a few easily-quantified variables under the unrealistic assumptions of perfect competition and the constraints of the often misused assumption of ceteris paribus.

(b) The lack of ability to measure certain key factors such as management, uncertainty discounts, subjective values placed on such intangibles as independence, pastoral living, the satisfaction of supplying a hungry world with its daily bread (see 37, p. 232 ff.).

(c) The apparent reluctance of economists, sociologists, and psychologists to pool their resources, and study collectively and systematically, problems and factors governing the behaviour of the family farm.[1]

Theoreticians crave perfection; hence theoretical physicists study the behaviour of bodies in perfect vacuums and frictionless surroundings. Economic theorists build into their models perfect knowledge, certainty, free entry into and exit from industries and above all, the omnipresent homo economicus who strives to maximize or minimize his objective function, the variables of which are all definable and quantifiable. However, whereas experimental physicists have managed to quantify many of the principal factors which theorists excluded for the sake of clarity and simplicity, thus transforming abstract reasoning into operational knowledge, many economists have been indicted on charges of evading their responsibilities to society by taking positivistic or animistic approaches in their research and failing to produce operational theories to solve real world problems. They are accused of falling back on ceteris paribus as a panacea for the

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[1] One discipline in which this reluctance to cooperate in interdisciplinary research seems to be fast fading away is development economics where the vastness of the problems of underdeveloped nations is so great that sociologists and economists soon realized that it was futile for each to attempt to work independently of the other. See, for example, Benjamin Higgins, Economic Development, (New York: W. W. Horton & Co., 1959), pp. 731-41.

inability of their theories to project and explain the phenomena under study (31).

Several agricultural economists within the last decade have taken up the challenge and attempted a serious search for valid, operational theories relating to real problems of the agricultural sector. This quest was aided by the development of large-scale computers which allowed for the processing of large, multivariate problems characterized by complex interactions among large numbers of variables.

The forerunners of the studies based on mathematical programming, simulation, and optimization go back as far as the early nineteen-thirties when models of the family cycle were considered important, but it was realized that family goals and wants which influenced farm decisions were not as clear-cut as the main factors and goals influencing corporate decisions. Family preference sets, utility functions, and indifference curves--all abstract concepts and intangible, much less quantifiable--were recognized as important influences on farm family consumption and investment decisions. It also seemed clear that the farm family had goals which not only competed among themselves for the scarce resources allocated to consumption, but also vied with the production goals of the farm firm for allocation of profits to consumption rather than to production and investment. Partially governing the allocation decisions are moral and psychological attitudes to indebtedness, to utilization of the labour of others, and to the security of full ownership. The clash of the socioeconomic makeup of the farm family with the purely economic needs of the farm firm is important in the creation of problems with respect to production, efficiency and growth of the firm.

Studies by Kirkpatrick, et al. in the 'thirties (35), Heady, et al. (22), Hurwicz (26) and others recognized the necessity for including sociological and psychological factors in an analysis of production and investment decisions of the family unit. Whereas Kirkpatrick's study was mainly descriptive in approach, Heady and his co-workers set out an analytical framework showing how the Pareto-optimality conditions apply to allocation of resources between production and consumption on the family farm. Then, assuming rational behaviour of farm operators, they demonstrated that as new phases in the family cycle are reached changes of values occur. Such changes manifest themselves in a revaluation of both "monetary income" and "non-monetary income" (22, pp. 389 ff.)--i.e., the slope of the family's collective indifference curves changes as a new phase in the cycle is reached. Concurrently changes are wrought in the transformation (production possibilities) curve as resources grow and technology and skills improve. Both these factors lead to a shift of the point of tangency between the two sets of curves, hence to a different behavioral pattern with respect to allocation decisions. Heady did not attempt any type of projection of capital accumulation under different sets of behavioral patterns, but he did make "some rough measurements. . .of resource productivity. . .to determine whether possibilities do exist for rearranging farm production units to permit greater output from resources employed in a particular farming area." (22, p. 395).

In the fifteen years since Heady's study an entirely new approach has developed to analysis of firm growth. It is characterized by two basic types of model: mathematical optimization (or analytical) models

and simulation models, which although nonoptimizing, can represent rather complex decision processes. Initially static linear programming models were employed to provide normative solutions to problems of farm resource allocation. These did not relate to growth though. They were more concerned with comparative statics and monoperiod resource allocation problems. As the mathematical programming tool became more familiar, its uses were expanded. Thus, in 1959, Loftsgard and Heady showed how "dynamic linear programming" as it was somewhat erroneously called, could provide optimum farm and home plans. In fact, the model was multiperiod rather than dynamic but served as a trailblazer for later developments.

The group of models based on optimization (multiperiod or recursive linear programming) and on simulation which were developed in the decade between 1958 and 1968 have been reviewed by Irwin (27). He also supplied a long list of references to studies using these techniques; therefore, only a few of the key points relating to this method of studying growth of the firm will be discussed.

A main criticism of many of the comparative static supply adjustment models, or those relating simply to resource and enterprise allocation, is that this type of model ignores the balance sheet in explaining net worth and liabilities and in the generation of funds from external sources. Similarly, although the models often dictate total change in enterprise mix between the initial conditions and the ultimate solution, the solution tells nothing about the process of getting from one situation to the next. Often such models also fail to handle the problem of internal generation of funds.

Some of the above failings can be removed by employing multi-

period linear programming. Models which employ this approach, such as that of Loftsgard and Heady (40), or the much more intricate and detailed one developed by Martin and Plaxico (43), serve to show the development path to be followed in the growth process dictated by the solution. However, they employ what might be considered perfect hindsight in arriving at a solution. By working out a simultaneous multiperiod solution for the entire planning period, through optimization which employs both a forward and backward approach to the problem, an important element in the decision process of investment is left out--the element of uncertainty and unfulfilled expectations. In fact, although they cover a period of a number of years and although the solution of these models indicated what should be done in each of the years within the planning horizon, they are not truly dynamic. Because of this lack of true dynamic content of the polyperiod model and its ex ante optimization over the entire planning horizon, it lacks something in its ability to explain how firms facing the same resource constraints and identical exogenous conditions can end up not only as enterprises of different size and with different allocation of resources among productive activities, but also how they can follow completely different growth paths in arriving at this situation. Perhaps this can be further clarified in the following section.

Subjective Factors and Statics and Dynamics in Theory of the Firm

Static theory of the firm, assuming the entrepreneur wishes to maximize profits, sets down clear-cut and objectively defined criteria to guide decision makers. Investment must increase until the firm has exhausted net economies of size if it is to reach a size of plant where

production efficiency is maximum (minimum per unit costs of production). This stage is reached at a scale of operation represented by the minimum point on the long run average cost curve.

Agriculture is highly competitive due to its atomistic nature. At the same time value of production is susceptible to stochastic variations based on unpredictability of weather and on producers' reaction to and collective influence on prices. Under such conditions it is necessary to produce an intended volume of goods at lowest possible costs in order to maximize profits in good crop years, while reducing potential losses to a minimum in "lean" years.

The concept of equilibrium in static theory is timeless. The question of adjustment paths and speed of reaction to changing exogenous factors is disregarded. Nerlove (46) and Koyck (36) introduced the concepts of adjustment speed and adjustment paths in their work. However, in both cases the emphasis was mainly on positive, empirical measurement of adjustment, rather than on the interaction of economic and subjective factors influencing speed of adjustment or the consequences of following different paths in the return to an equilibrium position.

Hicks (25) expanded on Marshall's time period analysis and developed the concept of dynamic equilibrium with the aid of his "Monday market" illustration. Price expectations, elasticity of expectations, and the influence of skewness and kurtosis in the probability distributions of key variables were shown to have a major effect on entrepreneurial decisions and the ultimate attainment of equilibrium. Here again, however, the factors considered are purely "economic" insofar as they relate directly to market and technology parameters. The influence of personal

biases, individual preferences, and managerial abilities are disregarded or, at best, only implicit in the elasticity of expectations.

Leibenstein (38) set out a plausible description of the growth path of a firm in which he took into account several of the subjective attitudes to risk, uncertainty and internal and external credit rationing. Scitovsky (52) also showed how subjective, nonprice oriented evaluation of credit use by entrepreneurs could result in firms of different sizes although all entrepreneurs may have access to identical technologies and be subject to similar price ratios in product and factor markets.

To recapitulate, a large portion of the factors influencing production decisions and growth and adjustment paths of the individual firm are subjective and as yet unquantifiable in any objective, scientifically acceptable manner. Such factors generally have been ignored in the conventional theory of the firm and its study of equilibrium. Dynamic theories have implicitly recognized the import of subjective evaluations and individual preference sets but have accomplished little in incorporating them explicitly into a model which has explanatory, descriptive, and predictive powers, all three of which are necessary if a theory is to be scientifically valid.

It is mainly in the descriptive and predictive elements where the polyperiod programming models are weak. The following passage written by Wassily W. Leontief[2] appears to describe the situation of the family farm exceedingly well.

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[2]Wassily W. Leontief, Time Preference and Economic Growth, Reply. A.E.R. 49:1041-3, Dec. 1959, quoted in Richard H. Day, Recursive Programming and Production Response. Amsterdam: North-Holland Publishing Co., 1963. P. 108.

> Economic /change/ is. . .a continuing, unending process, the path of which is determined by a never-ending sequence of choice. Particularly important from this point of view, is the fact that the explicit time-horizon of each one of these successive choices is shorter, in principle infinitely shorter, than is the span of time covered by the dynamic process as a whole. Thus, while each step, being determined by a conscious act of choice, satisfies certain maximizing conditions, this sequence as a whole does not.

Recursive Programming

Day (10), commenting on Leontief's article, states: "This statement concisely describes the principle of economic behavior which is mathematically expressed by recursive programming models." (10, p. 109). Here, then, is a tool which simulates the mechanics of the decision-making process of the entrepreneur. If it is possible to build into a recursive model the preference sets, or some facets of such sets, of a number of prototype farmers, quantitative measures of the effects of certain behavioral patterns on level of profits and the growth paths of family farms may result. As a starting point the prototypes or attitudes corresponding to various stages of the family cycle as studied by Heady and his coworkers (22) can be used.

The sections that follow will show how recursive programming is suited to the specific type of problem which concerns growth and capital accumulation and will demonstrate the technical manner in which it is able to adapt itself to changing behavioral patterns of the decision maker. The major contributor to the development of recursive programming has been R. H. Day, and it is natural that much of the following leans heavily on his monograph, "Recursive Programming and Production Response" (10).

Dynamic Aspects of Recursive Programming

The chief impetus to the development of recursive programming was provided Day by James M. Henderson's study. "The Use of Agricultural

Land, A Theoretical and Empirical Inquiry" (23). In this work the author postulated two basic principles of resource allocation by farmers:

1. Comparative net revenues of enterprises per unit input of scarce resources determine allocation of those resources.

2. Resource allocations for a given production period are a variation on the allocation pattern of the previous year. "Specifically, (the farmer's) acreage plantings for each crop are assumed to be constrained by maximum and minimum limits which indicate his desire for diversity and reluctance to depart from an established pattern." (23, p. 243). This all-important second principle is a departure from the traditional assumptions of perfect competition under perfect knowledge. It incorporates some of the spirit of Leibenstein's long run model of the growth of the firm (38) and implies that inexperience and lack of perfect knowledge influence short run decisions as well as those regarding long term investments.

The first criterion has always been considered of paramount importance by theorists of the firm but in empirical analyses of supply and demand usually seems to have been lost in the shuffle and replaced by the assumption that farmers react directly to price changes rather than to changes in the relative profitability of enterprises. Here again, the ceteris paribus assumption has clouded rather than clarified questions of producer response (10, p. 30 ff. especially footnote 10).

The dependence of production (and investment) decisions on decision patterns of previous years indicates the necessity for using dynamic tools in analysing production and growth within the firm. According

to Samuelson: "We may say that a system is dynamical if its behavior over time is determined by functional equations in which 'variables at different points of time' are involved in an 'essential' way." (51, p. 314). Samuelson distinguishes several types of dynamic systems, two of which are of specific interest in the context of the present study.

The first category contains complete causally-determinate systems. The behaviour of such systems depends on the initial conditions governing them and on the time which has elapsed since they were established. The solution of the system has the mathematical form:

$$x = f\left[t - t^{o};\ \bar{x}\ (t_o)\right]$$

where $\bar{x}\ (t_o)$ is the vector of initial values or conditions at t_o.

If not only the value of $t - t_o$ influences the system, but also the actual point in time from which observation begins affects it--then it is labelled an incomplete-causal-historical system whose solution takes on the form

$$x = g\left[t;\ t^{o};\ \bar{x}\ (t_o)\right]$$

or, as Day presents it[3]

$$x = f\left[t - t_o;\ t;\ x(t_o)\right]$$

It is obvious that in a study in which it is postulated that variables such as the family cycle influence the decision-making unit, an historical formulation must be used to analyse and project behaviour.[4]

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[3] A general classification of dynamic systems can be found in: Paul Anthony Samuelson, Foundations of Economic Analysis. Cambridge Harvard University Press. Seventh printing. 1963, pp. 315-20 and in Richard H. Day, op. cit., Chapter 3.

[4] The dynamic system formulated by Day is also historical, but not for the same reason. His attempt to introduce technological change and investment in new technology gives his model its historic character, whereas in the present study age and family status of the decision-making unit add the historical dimension.

The Recursive Programming Technique

In essence recursive programming utilizes the linear programming algorithm in an iterative process to solve a system of dynamic equations.

> A linear programming problem is defined for each time period, the constraints and net return expectations of which are predetermined recursively by dynamic equations. The multiple phase behavior of the system is then determined by a dynamic system of equated constraints. The number of distinct phases is finite. The dual variables of the system are defined by dynamic dual systems of equated constraints, and express the behavior overtime (sic), of the marginal net-revenue productivities of the constraints to the primal problem (10, p. 50).

Elsewhere Day describes recursive programming as "the search for sets of functions which satisfy a system of nonlinear simultaneous difference equations." (10, p. 53). Dynamic linear programming or polyperiod programming differs from this insofar as the recursive generation of constraints in the dynamic program is triggered by a single optimizing decision which determines the behaviour of the system throughout the time span. The time element is introduced through a block triangular simplex or matrix with number of blocks corresponding to number of time periods considered. As Day states: "This kind of model is dynamic in the Hicks sense only." (10, p. 54). It in no way simulates the "never-ending sequence of choice" described by Leontief.

Formulation of the Problem. The mathematical formulation of any iteration of a recursive programming problem is of the following general form:

$$(1) \qquad \pi(t) = \max_{x(t)} \sum_{j=1}^{m} \hat{z}_j(t)\, x_j(t)$$

subject to

$$(2)\qquad \begin{aligned} a_{11}x_1(t) + \cdots\cdots + a_{1m}x_m(t) &\leq b_1(t)\\ a_{21}x_1(t) + \cdots\cdots + a_{2m}x_m(t) &\leq b_2(t)\\ &\vdots\\ a_{k1}x_1(t) + \cdots\cdots + a_{km}x_m(t) &\leq b_k(t) \end{aligned}$$

$$(3)\qquad \begin{aligned} (1 + \beta_1(t))x_1(t). &\leq x_1(t-1) + u_1(t)\\ &\vdots\\ (1 + \beta_m(t)x_m(t) &\leq x_m(t-1) + u_m(t) \end{aligned}$$

$$(4)\qquad \begin{aligned} -(1 - \lambda_1(t)x_1(t). &\leq -x_1(t-1) - u'_1(t)\\ &\vdots\\ -(1 - \lambda_m(t))x_m(t) &\leq -x_m(t-1) - u'_m(t) \end{aligned}$$

where t = the time period for which a solution is sought, t = 1, ..., s.

$\hat{Z}_j$ = expected net revenue (revenue - variable costs) per unit of real activity j or, reservation demand price on use of scarce resource j, j = 1, . . ., m.

x_j = level of activity j.

a_{ij} = input-output coefficient for resource i, i = 1, . . ., k, per unit of activity j.

$0 \leq \beta, \lambda \leq 1$

$$(5)\qquad b_{it} = \gamma_i\left[a_{i1}x^*_1(t-1) + \cdots + a_{im}x^*_m(t-1)\right] + u_i(t)$$

The parameter b_{it} represents production capacity or level of constraints in period t which is a function (γ_i) of level of production (and investment) in period t - 1, as represented by $x^*_j(t-1)$ and, perhaps, of exogenous factors (e.g., production quotas) - u_i, which are not generated recursively.

It can be seen that the subsystem of equations containing the objective function and the first k constraints is identical to the general

formulation of a linear programming problem. The usual linear program of this type, however, is not concerned with the determination of the level of the b_i variables. They are regarded as exogenous.

Objective Function. It should be noted that $\hat{Z}_j$ in the objective function was defined as expected net revenue per unit. The net revenue component is influenced by product price, yield per unit of factor input and by factor prices. Mathematically, for any period actual net revenue Z_j can be expressed as

$$(6a) \qquad Z_j = P_j Y_j - \sum_{n=1}^{N} w_{nj} P_n$$

where

Y_j = yield or level of production per unit of activity j,

w_{nj} = level of input of variable factor[5] n per unit of activity j,

P_n = price per unit of factor n.

All four components of Z_j vary over time although in the definition of a process or activity vector w_{nj} and Y_j are usually considered constant. Assume for simplicity that the ratio Y_j/w_{nj} $(n = 1, \ldots, N)$ remains constant throughout the period analyzed.

Then

$$(6b) \qquad Z_j(t) = P_j(t)\, Y_j - \sum_{n=1}^{N} w_{nj} P_n(t)$$

The expected net revenue from any process j can then be expressed as the difference between the average weighted product of past product prices and yields and past variable factor prices and input levels where weights are determined in a manner similar to the method developed by Nerlove in his distributed lag analysis.

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[5]The variable w_{nj} is used here, rather than a_{nj} since the latter designates an input-output coefficient for fixed or constrained resources, whereas the former represents purchasable, therfore variable resources.

$$(6c) \quad \hat{Z}_j(t) = \sum_{s=0}^{t} \alpha(1-\alpha)^{t-s} P_{js} \sum_{w=0}^{t} \beta(1-\beta)^{t-w} Y_{jw} - h_j$$

$$\text{where } \sum_{s=0}^{t} \alpha(1-\alpha)^{t-s} = \sum_{w=0}^{t} \beta(1-\beta)^{t-w} = 1$$

The generalized form of the objective function then becomes

$$(1b) \quad \pi(t) = \max_{x(t)} \sum_{j=1}^{m} \left[\sum_{s=0}^{t} \alpha(1-\alpha)^{t-s} P_{js} \sum_{w=0}^{t} \beta(1-\beta)^{t-w} Y_{jw} - h_j \right] X_j(t)$$

In the example used by Day (2, p. 41), the entire weight is given to values of P and Y of the previous year and the objective function takes the form

$$(1c) \quad \pi(t) = \max_{x(t)} \sum_{j=1}^{m} \left[P_j(t-1) Y_j(t-1) - h_j \right] x_j(t)$$

which reduces to

$$(1d) \quad \pi(t) = \max_{x(t)} \sum_{j=1}^{m} z(t-1) x_j(t)$$

The objective function in (1b) more closely approximates what is usually postulated as farmers' allowances for risk and uncertainty based on expectations of the future. These themselves are rooted in the past. As Day himself explains farmers' behaviour:

> The uncertainty which leads to constraints on the departure from existing crop patterns derives from two interrelated phenomena. One is the farmer's rough acquaintance with the "elasticities" of demand for his products. The second is the variability of yields and hence of net returns due to more or less random weather variations. (10, p. 87).

Day sees this uncertainty as the basis for deriving the flexibility constraints expressed in systems (3) and (4) below. Actually the above mentioned factors find their expression both in the flexibility constraints and in the expected net revenues, the $\hat{Z}_j(t)$ values.

Input-output Coefficients--a_{ij}. If the model is to be as realistic as possible, it must allow for changing technology, economies and diseconomies of scale. The last two have been incorporated in linear programming models through segmentation and iterative procedures (57 and 4). Day incorporated technological improvements and innovations through introduction of additional activities into the recursive model at various points in time. The most accurate approach involves both the incorporation of the time element into the input-output matrix--expressing its elements as $a_{ij}(t)$, rather than a_{ij}, and also introducing new technologies in the form of additional activities (10, p. 64). In this form it is possible to introduce both productivity trends, which are continuous in nature, and innovations, which are discrete.[6]

Flexibility Constraints. The constraints in the form of the inequalities

$$(1 + \beta_j(t))x_j(t) \leq x_j(t-1) \qquad (3)$$

and

$$-(1 - \gamma_j(t))x_j(t) \leq -x_j(t-1) \qquad (4)$$

represent Henderson's second principle regarding farmers' production decisions: the production pattern in any one year is a variation on the pattern of previous years. Constraints expressed as in inequalities (3)

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[6] Day distinguishes between innovation and diffusion, the latter representing "rate of adoption. . .after the innovation period." (10, p. 63). Rate of adoption is important in an aggregate model, but in a study such as the present one it is the advantage of the innovator (in terms of profits and growth) relative to the conservative follower which is of major concern. It is extremely difficult to obtain accurate estimates of annual changes in input-output coefficients although approaches such as that of Heady and Auer (21), on imputation of production to technologies, may facilitate this in the future.

represent upper bounds, placed subjectively, on the level of activity x_j in period t. In other words, activity j cannot be increased to a level greater than $(1 + \beta_j)$ of the previous year's level.

It should be noted that in Day's model the upper and lower bounds were regarded as constants, whereas in the above formulation both are expressed as functions of t. The reasoning behind this variation springs from the fact that in Day's study of the Mississippi Delta he analyzed aggregate production. The present topic requires one to simulate the behaviour of farmer prototypes, as individuals. Whereas in the aggregate it is reasonable to assume that the varying influences on groups of farmers of different stages in the family cycle average out and result in a relatively constant behavioral pattern, the very assumption of constant behaviour at the individual level (β constant) contradicts the assumptions of the study and defeats the purpose of the model (10, p. 87). This problem will be discussed further in subsequent sections.

Flexibility Coefficients. Day, in his model, utilizes estimates of three types of flexibility coefficients: $\bar{\beta}_j$--determining the upper flexibility limit with respect to the expansion of enterprise j in a given period; $\underline{\beta}_j$--determining the lower flexibility limit of j--that is the extent to which the scale of operation in activity j can be reduced in any period relative to the preceding period;[7] α_{ij}--the investment coefficient (greater than unity) which allows for a relation whereby maximum potential net investment for any technology i used in enterprise j in any year t cannot exceed a certain fraction of the level of utilized capacity in the year t - 1.

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[7] This corresponds to γ_{ij} in the notation used above.

The limitations of this formulation have been recognized by Day (see chapter 5 especially footnotes 2 and 3), but even with its weaknesses it has proved operational in an aggregate analysis of production response in the Mississippi Delta. The idea of a time lag in adoption of innovations: diffusion, as Day has termed it, and the influence of uncertainty of expectations on the decisions of farmers to abandon crops which are relatively unprofitable, definitely are factors which justify flexibility constraints at the aggregate level. One must realize, however, that such constraints cannot be transferred unchanged to a model simulating the behaviour of an individual farmer. This is especially true where the model attempts to describe adjustment and growth over a long period.

In an aggregate model it is reasonable to assume there is enough heterogeneity among individuals with respect to knowledge, managerial ability and expectations that a decline in the relative profitability of an enterprise will not lead to an abrupt cessation of production. Just as technology "diffuses" so realization of the relative profits to be gained from altering cropping patterns under changing price relationships filters down from more progressive and able managers to the average and poor farmers. Thus, in an aggregate model the acreage of a newly introduced crop or a newly profitable crop can be assumed to increase in a manner similar to a geometric progression of the type $x_t = (1 + \beta)^t x_o$, and acreage of crops which have become relatively unprofitable may decrease geometrically, asymptotically approaching zero or some minimum positive level. This means that a realistic description of regional production response can be obtained by introducing actual aggregate scale of regional production in period $t_o - 1$ as initial constraints and allowing flexibility coefficients to govern expansion or contraction of enterprises through the period under analysis.

On individual farms enterprise mix may change much more radically over time. In many instances factors fixed in the short run prevent farmers from introducing new enterprises. Lack of sufficient capital, buildings, or specialized machinery are a few of the more obvious factors which may temporarily stop a farmer from embarking on new ventures. With the passage of time and growth of resources new possibilities may become available to him. An example of this was presented by Loftsgard and Heady in their eight-year "dynamic" programming model for an Iowa farm (40). In the first year crops and 45 hog litters represented optimal enterprise organization. As capital and available family labour increased, the hog enterprise was expanded to a maximum of 80 litters. In the fourth year long-fed steers were introduced only to be replaced in the sixth year by short-fed heifers. Investment in hogs was not expanded due to building and managerial limitations; the shift from steers to heifers was made when the supply of home-grown feeds became limiting. Heifers offered a higher return to feed as compared to steers. This type of volatile response is not possible in Day's recursive model unless formulation of the flexibility constraints is modified slightly.

Day attempted to estimate supply response in the aggregate. If a similar supply estimate were attempted on the basis of aggregation of individual supply response curves for "typical" farm models, new problems not encountered in the aggregate would have to be dealt with . Some of these are:

1. Allowance for greater flexibility in introducing new enterprises and rejecting old ones.

2. Assuring that new enterprises are begun at some level which

will allow at least minimum efficiency or production rationality. (For example: it is improbable that a farmer would begin with only one or two sows if he decided to begin producing hogs; the cow-calf enterprise at times demands the introduction of an entirely new crop rotation which would not be worthwhile if only a few animal units were raised).

3. Prevention of over-diversification within the farm unit.

It is certainly far from a simple matter to find a solution to the first problem which can be integrated into a program formulation. The reality of Henderson's second principle of resource allocation has been stressed strongly as has been the importance of the lower flexibility bounds in reflecting the variety of factors that lead to caution in abandoning (temporarily) relatively unprofitable alternatives. Similarly, there exist elements such as inexperience, lack of sufficient knowledge and expectations governed by high variance or skewness of distribution which probably serve to curb any impulse to enter into new enterprises on a large scale. These appear to justify introduction of upper flexibility bounds. On the other hand, where rational examination of the economics of an enterprise proves such a venture to be worthwhile, even after large uncertainty discounts have been applied to net revenues and a high cost has been placed on specialized equipment which is necessary for such new activities, there is no reason to prevent the entrance of such a new enterprise into the program. The magnitude of the discounts on yields and prices, and the additional uncertainty costs attached to purchase of new equipment or construction of new buildings should be based on the amount of the new "high risk" investment, the extent to which new purchases will be specific to one enterprise and the degree of experience the farmer has had in the past

with closely allied enterprises. Once the enterprise has entered the optimal solution for any given year, uncertainty discounts can be gradually removed and expansion governed by the upper flexibility constraints.

The second and third points mentioned above are actually components of a single problem. Due to the fact that scale of enterprise is governed by upper and lower flexibility constraints as well as by limited resources, it is possible that an optimal program may contain more enterprises than are practical from a farm management point of view. It would therefore appear that in the formulation of this type of problem it is of paramount importance that a basic unit of any activity be so defined as to allow for efficient production and that integer programming be incorporated. Here, too, once an enterprise enters an optimal plan it may be allowed to expand gradually in following periods provided its initial scale was sufficient to allow for rational production.

At first glance it appears that none of the above problems would be pertinent to the Mississippi Delta model insofar as they relate directly to the micro level of farm management and production response, while Day's model dealt with aggregate response. The aggregate model did encounter difficulties, however, in predicting transitions from older to more advanced technologies:

> Figures 4 through 8 show for each crop the model estimates of total process utilization by technological stage, . . . Even after the introduction in 1946 of Stage III and IV processes, Stage Ib continues to increase! This is due to the decision of producers to increase cotton production in those years at a greater rate than investments in the more advanced technologies. . . .Even in 1957 a substantial acreage of cotton was harvested by hand, i.e., by Stage III methods. This indicates a structural flaw, one that needs to be rooted out of the model if it is to represent accurately the rate of diffusion of technical innovations.

. . . . . .

> The explanation for this lies partly in the restricted supply of advanced machinery and partly in the lack of knowledge of new methods among farmers which is only supplanted gradually with the passage of time (10, pp. 129-30, and p. 144).

The author concludes from these findings that: "A somewhat more general representation of investment processes should be one of the first items on the agenda for further research" (10, p. 130). From the analysis in preceding chapters of the influences on production decisions of factors such as the family cycle, attitude to credit and uncertainty, the failure of the model to predict correctly the rate of introduction of new techniques was almost to be expected. Decisions involving deviations from tried and tested production methods and which also involve investment of relatively large sums in highly specialized equipment (such as cotton pickers), may be influenced more by the above mentioned subjective factors than by the profit maximization motive implicit in the linear programming method and expressed by the objective function. It is hoped that the methods suggested above and those of them incorporated in the present model (as described in the following chapter) will indicate possibilities of solving this problem or, at least, indicate the differential effects on profits and growth of varying attitudes to adoption of new technologies. If so, the results may serve as a guide to those involved in extension and education in developing a more realistic approach to farmer's investment decisions and diffusion of innovations.

CHAPTER VI

FORMULATION OF THE RECURSIVE PROGRAMMING PROBLEM

At any given point in time a recursive linear programming model reduces to a linear programming model. The first section of this chapter describes the general method employed to simulate the growth process of the farm firm. The second presents the technical structure of the initial matrix with respect to the objective function and expected net revenue coefficients. Categories of real activities, limiting resource levels, and other pertinent technical details are discussed in Appendix 2. In the final portion of the chapter the behavioural patterns which were examined with the aid of the model are discussed.

I OBSERVING THE GROWTH OF THE FARM AND FIRM

This study is an attempt to observe production, growth, and capital accumulation at the family farm level by approximating, as closely as possible, some of the decision-making processes of a farm family. Such processes are governed by various factors, including physical environment, institutional limitations, psychological makeup of the farm operator and whoever else participates in discussion on how the farm and home are to be run, past experiences, and future expectations. If it were possible to isolate and control exogenous factors such as weather, prices, and initial endowment of productive assets and force a given set of such conditions upon individuals possessed of different attitudes to uncertainty, innovations, credit, and optimal size of farm, one should be able to trace the direct

influence of such attitudes on allocation and investment decisions taken by the entrepreneur. One could then analyse *in vivo* the varying effects of these attitudes as they interact with the exogenous forces and indirectly affect financial prosperity and growth of farms through their influence on production patterns.

Unfortunately, this is not possible yet, and scientists are forced to work *in vitro* through creation of artificial models and simulation techniques. In the model presented here observations are made over a twenty-year period. It is hypothesized that farmers calculate expected net revenue from farm enterprises on the basis of net revenues obtained in the past. However, actual net revenue is not necessarily identical with expected net revenue, and this affects present resource levels and subsequent production decisions as well as present consumption and future investment.

A model employing recursive programming has been set up for an individual family farm where, on the basis of initial endowment and *expected* profits, a production and investment plan for the first year is formulated. This plan yields an *expected* net income. On the basis of simulated *actual* prices and yields for that year an *actual* net income is derived and the consumption possibilities and resource endowment for the following year are calculated. From these a new production plan, including investments in the business, is formulated, again based on profit expectations which now include the prices and yields of the preceding year. This procedure is continued for twenty years over which time the farmer and his wife age and the family expands. As the years pass the children consume, mature, supply labour for farm enterprises and eventually leave home. All of these activities provide factors which influence production, consumption, and in-

vestment decisions by affecting both the level of available inputs and levels of subjective constraints in the program.[1]

At this point a clarification is in order. The approach used in this analysis is primarily synthetic; the subjective constraints and their variations introduced into the model, are designed to be representative of prototypes of decision-making units.[2] The coefficients for individual flexibility constraints, however, were not estimated or derived from a statistical sample or a survey. They were postulated as possibly being representative of existing attitudes towards credit, uncertainty, and other factors. The constraint levels were chosen to demonstrate the effects of extreme attitudes, both extremely conservative and extremely liberal, on growth of the firm.[3] Within the technical limitations of time, reporting space, and computer availability, a few midpoints along the attitude continuum were also attempted in the hope of establishing some form of functional relationship between attitudes and growth.

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[1] An example of the influence of the family cycle on subjective constraints which affect profit maximization can be found in a farmer who restricts the amount of credit he is willing to use to a level at which net worth is at least three times greater than total liabilities. If each additional child in the family incurs annual consumption expenditures of $500, a family with 3 children would have $1500 less per year to invest in the farm in the form of added owned capital than if it were at the beginning of the cycle and childless. If this sum would otherwise have been invested in durable assets or deposited in the bank, net worth would have grown by $1500 and an additional $500 worth of credit could have been used. In this manner production is curtailed, full economies of scale may not be utilized, unit costs may be above minimum, and profit and growth rates might thus be retarded.

[2] Although they do not cover the entire gamut of existing prototypes.

[3] In the case of credit utilization the liberal farmer's attitude was as liberal as institutional constraints allowed it to be.

It was, however, recognized that no synthesis of yield and price series could replace the randomness of the weather or the fickle tastes and changing preferences which manipulate the market for agricultural products. Hence, although the technical input-output coefficients were, in the main, derived on the basis of the know-how and technology of the 'sixties, product and factor prices were calculated on the basis of time series data and price indexes computed by the Dominion Bureau of Statistics for Manitoba and Canada over the period 1944-1964. Let the reader, therefore, beware of the temptation to read into the results of this study any conclusions with respect to a warranted or actual rate of growth of Manitoba farms of similar structure, over this same period. It can in no way be construed as a projection or description of any real phenomenon and must be treated purely as a demonstrative or, at best, an analytical device.

Similarly it should be stated that the patterns of resource allocation, credit use, and enterprise mix which are developed in the various models cannot be utilized as extension recommendations and, where they indicate a divergence from present recommendations with respect to the above, should not be regarded as refuting the validity of extension and farm management advice.

II TECHNICAL DESCRIPTION OF THE MODEL

Before describing the factors which were varied and how they were introduced into the program, the basic components of the matrix will be presented.

The Objective Function. As presented in Chapter V, the objective function takes the form of

$$(1)\quad \hat{\pi}(t) = \max_{x(t)} \sum_{j=1}^{m} \hat{Z}_j(t)\, X_j(t)$$

where $\hat{Z}_j(t)$ = expected net return per unit of activity j in period t

($t = 1945, \ldots, 1964$)

$X_j(t)$ = level of activity j in period t.

Actual net revenue Z_j is calculated as

$$(2)\quad Z_j = P_j - \sum_{m=1}^{N} w_{mj} P_m$$

where

P_j = total revenue per unit of activity j.

w_{mj} = quantity of variable (or unlimited) production factor m necessary to produce the yield achieved from one unit of activity j.

P_m = price of factor m.

Derivation of Expected Net Revenue Coefficients ($\hat{Z}_j(t)$). D. Gale Johnson (30) has pointed out the important effects of uncertainty on farm income, resource allocation, and ability to use credit.

> Farmers basing production decisions on current prices usually find little relationship between such prices and the prices at harvest time or sale. Other farmers follow fixed programs, making no attempt to estimate short run price movements. Further, the uncertainty of prices leads farmers to reduce their demands for capital, to buy too small farms and to place great emphasis upon labor. Credit institutions reinforce at the same points. Income uncertainty places the farmers using borrowed funds in an extremely vulnerable position.

Expectations of future income are based mainly on actual past experiences with respect to yields, product prices, and production costs.[4]

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[4]For a list of six possible principles of price estimation available to farmers, see D. Gale Johnson, Forward Prices for Agriculture, Chicago: University of Chicago Press, 1947.

In Chapter V Nerlove's distributed lag model was suggested as a possible rationale behind farmers' formulations of price expectations. However, the relative values of the weights attached to past prices is of great importance in determining resource allocation, enterprise mix, investment in durable productive assets and, ultimately, the time path and growth of the firm's income and net worth. The greater the deviation of expected from actual prices, the less efficient will be production.[5] Expected profits will differ from actual returns, (hence estimated capital values of investments from actual capital values) and, due to lack of knowledge and the uncertainty accompanying expectations, allocation of funds among operating capital, durable productive assets and consumption will not follow the most efficient pattern. This will result in submaximal growth.

$$\text{Let } \hat{Z}(t) = \sum_{\lambda=1}^{T} \alpha(t - \lambda)\ Z(t - \lambda)$$

where

$$\sum_{\lambda=1}^{T} \alpha(t - \lambda) = 1$$

By allowing $\alpha(t - \lambda)$ to become various functions of λ it is possible to develop different forms for deriving price expectations. Four such forms will be considered here.

1. $\alpha(t - \lambda) = \frac{1}{T}$ for all λ

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[5] This will hold true unless relevant ratios of expected product and factor prices equal corresponding ratios of actual product and factor prices--in which case current production in any given year, with given plant size, may not be inefficient; however, the firm will not be operating at optimum size. That is to say, while it will be producing somewhere on the expansion path to a particular set of isoquants--it will not be producing at the optimum point on the long run average cost curve.

In this case the farmer's expected net revenue is calculated as a simple average of net revenues over the past T years. Under conditions of increasing profitability in agriculture between year t - λ and year t expected net revenue will be below actual net revenue for any given production plan. Consequently, the entrepreneur may be loathe to make investments which he might have undertaken had his expectations been accurate. Under falling net revenue trends the opposite would be true. The operator whose expectations at the beginning of the period exceeded actual realized profits may, on the basis of these upward biased expectations, make capital investments and shoulder financial burdens which he is hard pressed to carry without cutting back on consumption or disinvesting at a later date.

This method of forming price expectations may lead to relatively efficient production if (a) T is large enough to allow observations of past prices over a complete price (or net revenue) cycle such that $\hat{Z}(t)$ is close to the long run average net revenue and (b) prices and net revenues do not fluctuate greatly.

2a. $\alpha(t - \lambda) = 1$; $T = 1$ i.e., $\hat{Z}(t) = Z(t - 1)$

This is the price expectation used by Day in his model (10). It is also the form of expectation generally considered as a major factor in creating the cobweb phenomenon of recurring price cycles. Under relatively stable conditions and where prices of most relevant products have high positive correlations[6] such expectations may not depart too far from reality. However, the comments regarding form 1 above apply here too and the undesirable consequences may be more pronounced if prices and price ratios are unstable.

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[6]This is more likely to be the case on monocultural than on mixed farms.

2b. $\alpha(t - \lambda) = f[Z(t - \lambda), \bar{Z}]$

where $\bar{Z}$ is some average net revenue for the enterprise based on observations of a number of years. In this case α (where $|\alpha| \leq 1$) serves to dampen fluctuations of price expectations relative to changes in prices themselves. In other words, whereas elasticity of expectations under form 2a is unity, in 2b generally it will be less than unity. This method also allows the farmer to take account of price trends.

3. $\alpha(t - \lambda) = \begin{cases} 1 & Z(t - \lambda) = \min[Z(t - 1), \ldots, Z(t - T)] \\ 0 & \text{otherwise} \end{cases}$

This form represents a pessimist's outlook. He always discounts expected prices heavily and looks for the worst to happen. His expected net revenue is determined by the minimum return to a unit of enterprise over the T year period. In periods of rising profitability his profit estimations will be far below realized profits and, as a result, he may avoid or put off potentially profitable investments. It is most probable that family consumption will also be curtailed. However, under conditions of a downward trend in profits of agriculture, the pessimist's expectations closely approach actually realized profits.[7] Investments or obligations undertaken may be closest in value or volume to what the entrepreneur can actually handle and to what is optimal according to his production and utility functions.

4. The fourth method of forming price expectations incorporates one of those previously mentioned but utilizes some knowledge of exogenous variables which may influence <u>future</u> prices. It consists of forming price expectations on the basis of intelligent projections of trends, while de-

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[7] The pessimist's estimate will be equal to that based on the previous year's net returns as derived in 2a above. Of the forms mentioned these two estimates will be the most accurate.

pending on past experience to gain perspective and to attach suitable weights to the information at hand. Here articles available to the farmer on general economic conditions and indicators, extension bulletins on projected costs, demand and prices play an important part and can contribute much to the accuracy of expectations. This method is the most scientifically acceptable way of forming hypotheses with respect to price movements; providing it is based on information which is accurate. It is the only system mentioned which is based on causal relations among the future magnitudes of economic and noneconomic variables as well as on inertia or momentum, as the case may be. The more accurate the auxiliary information used and the causal relationships hypothesized, the closer will be the projected price ratios and incomes to those actually realized. Needless to say this approach is the most desirable from the standpoint of economic efficiency and growth of the firm.

The economic consequences of method 2a above, as observed in simulated growth models, will be discussed in the next chapter.

In calculating expected net revenue it was assumed that crop yield expectations remained constant throughout the entire period. Although, to justify this approach, it could be pointed out that the Manitoba crop insurance program bases premiums and indemnities on an average yield calculated over twenty years, it is quite clear that changes in cultivation techniques, fertilizer use and seed varieties created an upward trend of a few bushels in average yields in the years under discussion. However, it seems plausible to assume that a farmer will not formulate his yield expectations in a manner similar to that of forming price expectations. Yields are in the hands of God and Nature, on both of whom the farmer counts quite heavily

for his livelihood. His profits depend heavily on weather conditions being satisfactory, hence he plans production with the hope that his expectations of normality will be realized; his cultivation practices are based on these same hopes. Even after experiencing a year of drought farm operators may not adjust their yield expectations, claiming that they had experienced an abnormal year. If drought or hail should hit two years in succession, an opinion which often may be heard is: "After two bad years like that we should be due for a good one." Hence while the per unit revenue and cost expectations may be adjusted on an annual basis giving most weight to experiences of the immediate past, yield expectations very likely draw on the past five to ten years, and even then give less weight to "abnormal" or "subnormal" yields as defined by the general concensus.

The foregoing paragraphs have done nothing more than give a "man in the field" version of a Friedman-type "Permanent Yield" hypothesis where yield expectations are formed on the basis of a "permanent yield" component which is similar to the long run average, and a "transitory yield" component to which little if any weight is given.

A glance at Table XVIII will suffice to illustrate the difficulty of forming a quantitative estimate of crop yield trends on the basis of a short time series.

Crop yields used in this study for calculating both actual and expected net revenue coefficients were average yields reported for south-western Manitoba for the years 1954-1964.

Output prices were calculated with the aid of deflators based on Canadian Dominion Bureau of Statistics (D.B.S.) price indexes. Production

TABLE XVIII

FIVE AND TEN-YEAR AVERAGE YIELDS OF WHEAT AND OATS IN CROP DISTRICT TWO OF MANITOBA, 1936-1963*

a. Five-Year Averages (bushels per acre)

Period	1936-40	1941-45	1946-50	1951-55	1956-60	1961-63
Wheat	14.34	22.14	19.08	20.58	23.72	18.70
Oats	27.56	34.50	34.18	32.22	35.72	37.20

b. Ten-Year Averages (bushels per acre)

Period	1936-45	1941-50	1946-55	1951-60	1956-63
Wheat	18.24	20.61	19.83	22.15	21.8
Oats	31.03	34.34	33.20	33.97	36.3

* Source: Calculated from crop yield data in J. C. Gilson, "Instability in Agriculture and Crop Insurance," Winnipeg, Department of Agricultural Economics, University of Manitoba. Mimeo paper presented to the Farm Conference Week, University of Manitoba, March 1962.

See D. Gale Johnson, "A Price Policy Consistent with Economic Progress that Will Promote Adequate and More Stable Income from Farming," J.F.E., Vol. XXVII, No. 4, 1945, Appendix Note B.

cost deflators were also based on similar series.[8]

Input-Output Coefficients

The production activities used in this model were based on a linear programming study by J. A. Jeanneau(28), which calculated optimum combination of livestock enterprises for a representative farm on Waskada soil in southwestern Manitoba. Although additional constraints have been added, the portion of the matrix representing technical production possibilities was taken directly from Jeanneau's formulation. Production costs were also based on his study and adjusted for factor price changes between 1945 and 1964 on the basis of data obtained from the Dominion Bureau of Statistics for major factor categories.[9] Economies of size were introduced into cropping and some livestock activities, generally through reduction in labour and machine requirements, maintenance, and depreciation (see Appendix 2). They were linked to land purchase or building activities.

Initial Resource Endowment

Physical and Liquid Assets. Resource restrictions used in the initial matrix for all models were also adopted from Jeanneau's study with a few modifications based on the assumption that the period of the farmers' lives which the model was to depict was from age 35 to 55. Available land

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[8]Details are presented in Appendix 2.

[9]These categories included: livestock, building materials, equipment and machinery. For items not included in the above groups the Composite Index of Commodities and Services used by Farmers was employed as a deflator. See Appendix I.

was set at 320 acres, owned outright. Its total value was $24,000 or $75 an acre at 1964 prices ($8,540 at 1945 prices). Buildings were valued at about $6,000 (about $2,900 in 1945) and it was assumed that the operator had $5,000 in cash. The non-cash assets served as the equity base for obtaining credit from available sources. (For further details on physical constraints see Appendix 2 .)

Labour. There were three potential sources of labour: the operator, maturing sons, and hired workers. The operator of Jeanneau's "representative" farm supplied an estimate of the hours he himself was willing to work in each season of the year. These were accepted as the starting point for the present model as well. After deducting an allowance of 15 percent for general management and overhead labour the operator hours of labour available per season were:

Spring labour	490 hours
Summer labour	540 hours
Autumn labour	675 hours
Winter labour	975 hours

The operator was willing to employ hired workers in amounts up to his own labour input in each of the four seasons. A table of seasonal labour contributions of the farmer's sons, according to age, is found in Appendix 2 .

As the farmer availed himself of credit, labour became an important limiting factor due to the self-imposed limit on hiring. Therefore in one of the models formulated the limit on hired labour was removed to examine the effects this would have on production and capital accumulation. The consequences are discussed in Chapter VII.

According to Heady (22 , 405), "older operators prefer to work fewer hours and choose to produce products with a lower return per unit

of labour." It was assumed that the operator would impose a five percent decline in his own hours worked beyond the age of 45 and that there would be an additional five percent decline due to reduced efficiency between the ages of 50 and 55.

Credit. Initial liquid capital set at $5,000, represented cash on hand, market value of livestock on the farm at the end of 1944 and sale value of grain inventories at 1945 prices. This stock of capital could be augmented by borrowing activities up to the credit limits placed on the operator either by legislation or his own attitude to being in debt. Available cash in any year could be drawn on for payment of all cash operating expenses and cash requirements relating to investments. These included: production purchase of livestock, land, machinery, and construction expenses on buildings and improvements. In addition it had to supply enough funds to repay debts, pay taxes, contribute to the farm asset depreciation fund, and finance consumption for each year.

The farmer could draw on four credit sources. These included:

1. Loans available for the purchase of feeder cattle and yearlings. Duration of the loan was from time of purchase to time of sale at the end of the year. The rate of interest was five percent.

2. Loans available for purchase of herds of breeder cattle. These had to be paid off over ten years at 6.5 percent interest. The entire herd served as security for the loan.

3. Land purchase credit. Such loans were repayable over 30 years at 6.5 percent.

4. Machinery and building loans. They were medium term loans repayable at five percent over eight years. On new construction or building

improvement costs the entire sum could be borrowed. On machinery only two-thirds of the purchase price could be borrowed. The farmer had to finance the remaining amount from his own funds.

Once a loan was taken out the model made no provision for re-paying it at an accelerated rate. A ten-year loan could only be retired in ten equal annual payments, similarly a loan which was originally granted for an eight-year period could not be retired in less than eight years.[10]

Maximum credit available was calculated on the basis of 1964 levels--but was deflated to levels which would provide the same purchasing power in any given year. Thus, for example, land purchase loans in 1945 were limited to $14,000 while in 1964 maximum credit for land was $40,000. However, the 1945 loan would have allowed the farmer to buy the same acreage as that of 1964. The same is true of loans for livestock, machinery, and buildings.

Production Activities

The production activities or farm enterprises were selected from Jeanneau's study (28). Of the many alternatives developed by Jeanneau only representative ones were chosen for this study since the object of the

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[10] The only off-farm investment the farmer could make was in savings bonds which brought a return of only 4.5 percent each year. This may be considered a weakness of the model. It is magnified as the firm grows, capital becomes relatively plentiful and, due to limited labour or low prices, low marginal returns to capital are encountered within the farm business. Obviously, if it is profitable to invest in bonds at the rate mentioned, in a world of certain expectations it would be even more profitable to liquidate any outstanding liabilities, the lowest rate of interest on which is five percent. Of course, it is not unrealistic to assume that an entrepreneur is willing to pay between one-half and one and one-half percent for maintaining a certain level of liquidity as a hedge against uncertainty. For a more thorough discussion of this point, see, for example, D. Gale Johnson (4, p. 38-43).

present work was not to develop an optimum combination of livestock enterprises out of the total spectrum of technical possibilities but rather to observe and compare the growth of a number of firms facing identical production possibilities but reacting to outside influences with different decision patterns. Thus, for example, although Jeanneau allowed a choice among a number of rations in the cattle activities, here only one ration was made available to the operator for any given enterprise.

Main categories of real activities among which the farmer could choose in formulating his production plans are schematically illustrated below.

Flexibility Constraints

Flexibility constraints and adjustment coefficients in the program can serve to place upper or lower bounds (or both) on changes in activity levels from year to year. As mentioned in Chapter V it seems logical that farmers formulate their production plans for one year as a variation on the pattern of previous years. Following the reasoning of Koyck and Chenery (see chapter II), this should apply also to investment decisions. This study assumes that on a year-to-year basis adjustment of capacity will take place only when K_t^* is greater than K_{t-1},[11] not when it is smaller, i.e., a ratchet effect is postulated which allows for increased investment when actual production capacity is less than desired, but does not allow for disinvestment (nonallocation of funds to depreciation or sale of pro-

[11] As will be recalled from Chapter II K_t^* is desired or optimal capacity in year t and K_{t-1} is actual capacity in the previous year.

SCHEMATIC REPRESENTATION OF STRUCTURAL MATRIX EMPLOYED IN SIMULATION OF FAMILY FARM GROWTH

Cut Vectors b_i / Activities / Constraints	Cattle Self Financed	Cattle Credit Financed	Hog Production: Exist. & Impr. Bldgs.	Hog Production: New Bldgs.	Crop Rotation	Grain 1/ Buying & Selling	Labour Hiring	Land 2/ Purchase & Rental	Bldg. Const. Self Financed	Building Construction Cr.	Outside 3/ Investment
b_1 Seasonal Family Labor	1,1 A_{11}	,5 A_{12}	,8 A_{13}	,12 A_{14}	,14 A_{15}	,50 0	,54 A_{17}	,58 0	,85 0	,89 0	,92 0
b_2 Seasonal Hired Labor	5, 0	0	0	0	0	0	A_{27}	0	0	0	0
b_3 Land Consolidation & Rental	9, 0	0	0	0	A_{35}	0	0	A_{38}	0	0	0
b_4 Pasture & Pstr. Rental	20, A_{41}	A_{42}	0	0	A_{45}	0	0	A_{48}	0	0	0
b_5 Grain & Hay	22, A_{51}	A_{52}	A_{53}	A_{54}	A_{55}	A_{56}	0	0	0	0	0
b_6 Livstk. Space (Existing)	25, A_{61}	A_{62}	A_{63}	0	0	0	0	0	A_{69}	A_{610}	0
b_7 Livstk. Space New/Improved	27, A_{71}	A_{72}	A_{73}	A_{74}	0	0	0	0	A_{79}	A_{710}	0
$b_8(t)$ Credit Constraints	30, 0	$A_{82}(t)$	0	0	0	0	0	$A_{88}(t)$	0	$A_{810}(t)$	0
$b_9(t)$ Cash Constraints	37, $A_{91}(t)$	$A_{92}(t)$	$A_{93}(t)$	$A_{94}(t)$	$A_{95}(t)$	0	0	$A_{98}(t)$	$A_{99}(t)$	0	$A_{912}(t)$
b_{10} Outside Inv.	40, 0	0	0	0	0	0	0	0	0	0	A_{1011}
$Z(t)$ Net Rev.(+) or cost (-)	+(t)	+(t)	+(t)	+(t)	-(t)	-,+(t) (1)	-(t)	-,+(t) (2)	-(t)	-(t)	+ (3)

(1) Grain buying costs include transportation to farm. Grain selling revenues are net of transportation & handling costs.

(2) Land purchase costs include 1 year's interest on purchase cost of land and machinery plus 1 year's depreciation on machinery. Positive revenue designates a hiring out activity.

(3) Return on outside investment is 4.5 percent throughout the entire period.

(4) Figures in northwest corner of squares of b_1 vector indicate total number of activities to that point. Total number of activities in the matrix is 92.

ductive assets) when adverse conditions in a given year dictate underutilization of available assets. The results in Chapter VII indicate that, since labour and cash were limiting in the latter years of most plans, and operators tended to specialize in livestock production while renting out crop lands which they could not profitably cultivate, it may have been useful to allow them to sell excess land and improve liquidity. This was not done since it may have led to a series of consecutive land buying and selling activities from year to year---something which seemed unrealistic considering the low elasticity of supply of cultivable land in most farming areas. Instead the farmer could rent out land on an annual basis if he could not cultivate it himself.

Expansion of production was not governed in the model by explicit adjustment coefficients. In this case existing capacity acted as a damper on reduction of volume of production, and investment costs for new capacity on expansion of activities. Formulation of price expectations, coupled with constraints dictated by liquidity and availability of credit had the same effect. If an entrepreneur is by nature an optimist and looks for generally favourable market conditions (as implied by his profit expectations) it would be rational for him to expand capacity rapidly when his forecasts indicate it profitable. Once capacity has been increased though, it becomes difficult to disinvest even when expectations have not been realized.[12] Buildings cannot be sold easily without the land on which they stand, and machinery and equipment usually depreciate in market terms much faster than in actual production value.

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[12] This is not necessarily the case in an aggregate analysis.

Use was made of flexibility coefficients to express the influence of the family cycle on the supply of farm labour (see page 141) and, in one case, to express willingness to use credit. Implicit flexibility constraints on savings, investment, and growth influenced the models through the consumption function employed. Level of consumption for any year was determined outside the recursive programming solution. It depended on the programming solution obtained and influenced the quantity of liquid assets available to the following year's production and investment plan. The function incorporated influences of the family cycle inasmuch as the dependent variables used to determine consumption were net worth, disposable income, outstanding debt, age of operator, and family size. The last two are directly indicative of the stage in the cycle through which the farm family was passing.[13]

III THE MODELS--BEHAVIORAL PATTERNS EXAMINED

The main purpose of this portion of the study was to test the applicability of recursive mathematical programming (a) to an analysis of

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[13] Let; X_1 = net worth, X_2 = disposable income, X_3 = total debt, X_4 = operator age, X_5 = family size. The consumption function estimated on the basis of data from Carman District Farm Business Association records was:

$$\begin{aligned}\text{Consumption} = &- 414.1652 + .0108X_1 + .0259X_2 - .0417X_3 - 19.4332X_4 \\ &+ 954.3272X_5 + .00000293X_1^2 + .00000146X_2^2 \\ &+ .00000103X_3^2 + .3063X_4^2 - 72.5477X_5^2 \\ &- .00000109X_1X_2 - .00000662X_1X_3 + .00003505 \\ &+ .0003978X_3X_4\end{aligned}$$

$R^2 = 0.73$ degrees of freedom = 233

subjective factors and entrepreneurial behaviour influencing the growth of the farm firm, (b) to indicative planning of the development of the firm over medium term planning periods. Separate examination of the differential effects of attitudes towards use of credit, hiring of productive services (in this case workers), and level of living on productive capacity and capital accumulation, enterprise mix and, ultimately, levels of disposable income, could provide a useful demonstrative tool for extension workers in their attempts to raise levels of productivity on individual farms and create competitive firms capable of providing their managers with an acceptable rate of profit in a declining industry. The technique applied here could also serve to provide fairly accurate estimates of regional supply response if proper representative farms were chosen and a number of the improvements suggested in Chapter V were incorporated into the model (especially those relating to variability of input-output coefficients, attitudes to technical innovation and formulation of price expectations.)

Constraints of time, computing services and reporting space required that this analysis confine itself to a limited number of variables relating to farm development and to incorporation of only a few of the innovations suggested in Chapter V. In the main it relates to effects of attitudes towards use of credit although the consequences of limiting hired labour and reducing consumption as a substitute for credit use are also examined.

Five twenty-year development models were tested which can be classified as representative of three basic attitudes to credit:

a. No aversion to credit
   1. employing limited hired labour
   2. employing unlimited hired labour

b. Total aversion to credit
   1. with average consumption habits
   2. with lower than average consumption

c. Limited use of credit

All farm models began in 1945 endowed with the same physical resources (as described above and in Appendix 2), the same family composition and with all operators at the age of 35. They all faced identical production functions, enterprise possibilities, price expectations and actual market conditions. The only reason that the results of their simulated farm operating decisions could differ during or at the end of the period would be that their attitudes to credit, hired labour or consumption differed. The basic differences in attitudes are discussed below.

1. Profit Maximization--Limited Hired Labour. This model postulated an operator who was a profit maximizer in the textbook sense--except for the fact that in addition to his own and his family's labour he would hire workers only in a number equal to the amount of labour he himself was able to devote to the farm. He was willing to utilize all credit available to him externally, to the limit that farm plans proved it possible. At the same time his consumption schedule was normal (conforming to the function postulated in footnote 12 of this chapter).

2. Profit Maximization--Unlimited Hired Labour. During the calculation of the 20 annual production plans and plotting of the growth of the profit maximizer's firm it appeared that very early in its development production and growth were being limited by a shortage of labour in certain seasons. This second model was therefore postulated in order to

examine quantitatively the effects of the self-imposed limitations on use of hired labour. The unlimited supply of labour was the only aspect in which this model differed from the first. In a world of certainty of expectations the results of this farm's production decisions should provide the best results in terms of growth of production capacity, net worth, income, and consumption. It would serve as a measuring rod by which to evaluate the detrimental effects of aversion to credit or full use of hired labour.

3. Total Aversion to Credit--Normal Consumption. This model postulated that production, growth, and expansion of productive capacity could be achieved only through internal financing. Although total credit from the four different sources amounted to almost $30,000 in 1945 and increased to over $70,000 in 1964 this hypothetical operator would use none of it. In all other respects he was identical to the first operator, also limiting himself to hired labour in quantities not exceeding those which he himself could devote to farm operations. This farmer's consumption and saving schedule conformed to the "representative" function postulated in footnote 13.

It was hypothesized that this firm would find itself deep in a low level equilibrium trap (see Chapter II, p. 32) unable to boost itself beyong that level of capital which would facilitate increased rates of saving and investment. The farmer's refusal to avail himself of the means to provide the "minimum critical effort" to reach the take-off point to continuous growth should have doomed him to twenty years of stagnation. This did not happen. The results and implications will be discussed in Chapter VII.

4. Total Aversion to Credit--Reduced Consumption. A variant on model 3, this operator too refused to finance externally any of his farm operations. Supposedly this would bury his firm as well in the depths of a stagnant, low-level equilibrium trap. However, it has been postulated that many farmers who are averse to use of credit in their business, manage to grow by "pulling themselves up by the boot straps": they manage to expand capacity by reducing consumption and allocating more of net income to maintenance of capital and investment. Reference to the phenomenon of forced savings is found in many studies relating to problems of adjustment and development of the family farm (see, for example, Gilson, 17, pages 22 and 27). Strangely enough this appears to have been a widespread phenomenon in the history of agriculture, yet those who depend on forced savings to maintain their position or to grow behave far more in accordance with what Mrs. Robinson describes as the "morality of the entrepreneur" than with that of the peasant (of Chapter II, page 12).

Forced saving (reduced consumption) was achieved in the model by lowering this operator's consumption function by $500 throughout its entire range. In effect a consumption function identical in slope with that found in footnote 13 of this chapter was postulated, but the intercept was lowered from -414.1652 to - 914.1652. The influence of the additional $500 in saving (in the schedule sense) compared with model 3, on growth of the firm will be discussed in the following chapter.

5. Limited Use of Credit--Total Debt/Total Capital 1/3. This model represents a cautious user of credit, one who realizes the profitability of external financing but recognizes the risks involved in

overextension of his debt position. By maintaining a ratio of at least three to one between total capital and debt the farmer has a fair amount of security in the event of a crop failure or a series of poor years. He cannot be totally wiped out by such events.

The shifting upper limit on credit use was the only aspect in which the firm in model 5 differed from the one in model 1--the profit maximizer constrained by a limited supply of labour.

In the following chapter the differences among the models will be discussed in terms of the effects operator attitudes had on farm organization, resource utilization, farm income and growth of total capital and net worth and the contribution to value of total capital made by capital gains which have been considered by some to be an important supplement to farm income (19,6).

CHAPTER VII

COMPARATIVE RESULTS OF THE RECURSIVE PROGRAMMING PLANS

The working hypothesis governing this analysis was that differences in behavioral patterns and preferences among farm operators who were faced with identical conditions would affect allocation of resources as influenced by enterprise combination, and as a direct result would also affect rate of growth of the firm over time and the ultimate level of capital accumulation. In the process, levels of income, consumption, and saving would also be influenced. (As decisions on investment and enterprise development are implemented, physical production capacity changes; among operators distribution of capacity between crop producing assets and those specific to livestock production would also change.) While for each producer each step has been determined by a conscious act of choice, satisfying maximizing conditions, the sequence as a whole will not lead to maximization of the entire dynamic process over the planning horizon, even for the individual guided by his preference function and subjective constraints. The different constraints, causing different production decisions to be taken should probably lead to divergent values of the operators' objective functions at the end of the period.

The following sections will analyze the effects of individual attitudes as expressed in each of the five models tested, on the following aspects of family farm life:

a. Farm organization and resource use;
b. Income levels;
c. Growth of consumption;
d. Capital accumulation as reflected in total value of capital assets, net worth, and effects of different capital levels

on accumulation through capital gains (the wealth component of capital).

In the text and tables which follow, when reference is made to individual models they will be named numerically (i.e., model 1, model 2, etc.) where

model 1---refers to the "profit maximizer"[1] with limited hired labour;
model 2---to the "profit maximizer" employing unlimited hired labour;
model 3---the non-borrower enjoying average consumption;
model 4---the non-borrower who practised reduced consumption or forced saving;
model 5---the user of limited credit, maintaining a ratio of at most one-third between debt and total assets.

Where comparisons are made between groups, as opposed to individuals, reference will be made to "profit maximizers" (models 1 and 2), "non-borrowers" (models 3 and 4), and to the "cautious borrower" (model 5).

1. Farm Organization and Resource Use

Table XIX indicates levels of physical productive capacity in selected years of the plan period. The nonborrowers did not expand land holdiugs while the profit maximizers expanded from their original 256 acres to about 800 acres of cropped land within the first five years. The cautious borrower consistently expanded acreage until he reached about 740 cropped acres in 1961.

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[1]The term "profit maximizer" may be considered to be somewhat of a misnomer in this context insofar as in each case, except that of model 2, the farm manager has limited his operations so that even within the physical and economic constraints governing him, he will not be able to maximize profits. In the case of model 1, the farmer has been considered a profit maximizer since the claim was that his managerial ability limited the degree to which he could usefully and efficiently employ hired workers. In such a case he would be maximizing expected profits within his constraints.

TABLE XIX

PRODUCTIVE CAPACITY AND RESOURCE USE

Year	Model	Land		Livestock Buildings				Hired Labour			
		Arable	Cropped	Cattle	Feeder Hogs	Farrowing	New Improved	Spring	Summer	Fall	Winter
		acres	acres	sq. ft.	Hog Units	sq. ft.		hours			
1960	1	796	796	2500	76	241	995	490	510	675	949
	2	804	804	4044	42	262	-	646	634	909	1407
	3	256	256	1204	91	23	1748	32	34	49	109
	4	256	256	1285	121	34	1669	93	74	99	99
	5	479	439	2434	125	218	634	472	456	540	975
1965	1	796	58	7039	405	241	1053	466	367	350	376
	2	804	476	8920	213	262	-	830	585	1095	2801
	3	256	61	1203	423	23	1751	227	114	287	279
	4	256	0	1032	556	34	1920	235	142	246	975
	5	601	43	1540	537	218	1869	490	328	348	975
1960	1	796	471	3681	407	241	1020	300	0	506	787
	2	804	497	5975	496	262	-	702	90	974	1476
	3	256	148	1203	704	23	1751	490	0	247	75
	4	256	125	1032	774	34	1920	490	0	361	545
	5	687	474	3448	560	218	1920	490	0	612	851
1964	1	796	615	3681	407	241	1920	257	0	675	975
	2	804	451	5975	496	262	-	644	8	1030	2019
	3	256	9	1034	737	23	1920	359	0	366	975
	4	256	70	1032	776	34	1920	490	117	429	975
	5	737	631	3448	560	218	1920	344	0	675	975

The nonborrowers concentrated their investment activity in the initial five years on improvement of the existing 1920 square feet of livestock space suitable for farrowing and farrow and finish operations. They also built, out of their own savings, a small area of new farrowing space and feeder hog barns. As the years advanced they turned to large scale feeder hog production, ending the plan period with about 50 percent more capacity than the profit maximizers.

The profit maximizers made use of the credit available to them and expanded livestock facilities simultaneously with acquisition of land. Model 2, taking full advantage of its unlimited labour supply, doubled feeder cattle facilities and within the first five years constructed more new farrowing barns than any of the others.

Expansion of land holdings by borrowers and early construction of livestock facilities by all operators eventually left them with excess capacity due to limitations of operating capital and hired labour. All operators found it more profitable to leave some portion of their lands uncropped during the period 1952-1960 when returns to labour and operating capital were higher in livestock than in crops. Even after 1960 some lands were left idle, although not as large a proportion as in the previous period. It is interesting to note that the nonborrowers actually rented out their entire 256 acres of land at least in one year. The profit maximizers and cautious borrower all found it to their advantage in some years to rent out 80 percent or more of their land, devoting labour to livestock activities--but never their entire holdings. For the borrowers (cautious or otherwise) cattle production was the main competitor with land for labour and capital while hog production usually replaced cropping in

the majority of years on nonborrowers' farms when relative prices went against the grain.

Credit amounting to about $30,000 was available from all sources to any of the farmers in 1945; this increased to about $52,000 by 1950, $65,000 in 1960, and $71,000 in 1964--the last year of the plan. In the first three years the profit maximizers borrowed over $35,000 each for land purchases, building construction and improvement as well as for raising feeder cattle. The cautious borrower limited himself although in the first three years he borrowed more than $20,000 for similar purposes.

The use of credit greatly increased production capacity and allowed fuller use of existing resources. Borrowers' realized net income before taxes grew from about $7,000 in 1945 to well over $20,000 in 1950, while the nonborrowers began with incomes of less than $5,000 in 1945 and by 1950 had not even surpassed $16,000.

The extensive use of credit, and improved incomes of those willing to borrow are indicative of conditions and expectations favourable to investment in the initial years of the period. This situation did not last long though and was followed by a gradual decline in profitability of the enterprises available to the operators. Since profit expectations were based solely on past experience, rather than on attempts to forecast future terms of trade, producers often found themselves with excess capacity in both livestock facilities and land. Table XX illustrates this point in the case of feeder hog barns in selected models.

In 1951 all farmers were producing at full capacity as building space and land had grown to make full use of the available supply of labour and capital. By 1955 the profit maximizers had expanded feeder hog facilities

TABLE XX

UTILIZATION OF FEEDER HOG CAPACITY AND CULTIVABLE LAND BY SELECTED MODELS

Year	Model	Available Capacity	Unutilized Capacity	Percent Utilized	Percent of Arable Land Cultivated
		Hog Units			
1951	1	93	0	100	97
	2	80	0	100	100
	3	121	8	93	100
	5	145	0	100	100
1956	1	403	238	41	79
	2	213	10	95	100
	3	451	0	100	28
	5	537	230	57	75
1963	1	407	373	8	54
	2	496	360	27	54
	3	704	0	100	63
	5	560	412	26	78

almost to the maximum capacity developed for the entire period (see table XIX); however, they overextended themselves and in 1956 model 1 used only 41 percent of his feeder hog capacity and 79 percent of his land. The cautious borrower exceeded this only slightly. Model 2, on the other hand, operated at full capacity in 1956--indicating that labour supply rather than operating capital, may have been the main limiting factor for the other operators. Generally, in the years indicated in table XX, a strong negative correlation is evident between proportion of arable land cultivated and utilization of feeder hog productive capacity.[2]

[2] Table XX serves to illustrate Leontief's contention quoted in Chapter V.

2. Income Levels

One of the conclusions of Chapter II is that, although in the case of a family-owned firm the ultimate goal inducing investment is the accumulation of capital (potential purchasing power), the intermediate goal guiding the entrepreneur is "growth for the sake of profits." Profits or net income can be defined in various ways. For the sake of clarity a brief list of definitions of income terms as used here follow.

a. Realized net income is the value of the objective function of the recursive program as defined on page 119 .

$$\pi = \sum_{j=1}^{m} X_j \left(P_j - \sum_{n=1}^{N} v_{nj} P_n \right)$$

In words, this represents the difference between total revenue realized from sale of products plus change in market value of livestock during the year, and the cash expenditures for all purchased inputs including hired labour, transportation services, veterinary expenses, interest on loans, etc.

b. Disposable net income equals realized net income less land taxes and income tax.

c. Income to capital, management, and family labour is calculated by deducting estimated depreciation on durable assets from disposable net income.

d. Allocable cash income is a concept more of descriptive than analytical value. Within the present model it refers to that portion of cash income which remains from disposable income after the annual depreciation fund has been set aside[3] and payments have been made on outstanding

[3] No provision was made for disinvestment in capital either through sale of assets or nonpayment of depreciation.

loans. Payment of principal on outstanding loans is not a true production cost, it represents a redistribution within the balance sheet of the firm from liquid to nonliquid assets while increasing the ratio of net worth to total assets. Allocable cash income is the residual, after all obligations have been met, which can be channeled either to consumption or to saving, later to be used for operating expenditures or investment in additional capacity. If all allocable income is consumed no growth will be forthcoming except through possible capital gains. If relatively large amounts are directed to saving and profitable investment, the firm can expand. This can be diagrammatically demonstrated with the aid of the transformation curve in figure 6, where value of productive goods or capital is measured along the abscissa and of consumption goods along the ordinate.

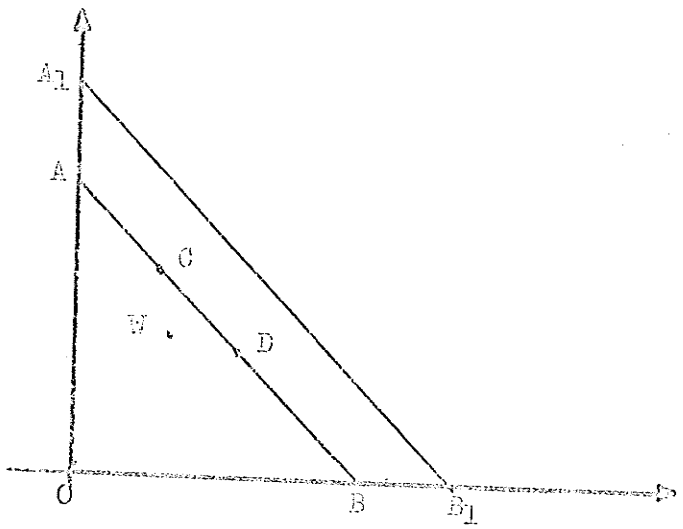

Figure 6. Transformation curve of capital and consumption goods and its expansion through saving and investment.

Since both factors are measured in money values in the same period, $OA = OB$ and they represent disposable income. The line AB represents all possible combinations of consumption and productive investment. There exists some point C which represents a combination which just allows for allocation of depreciation on existing assets with no growth at all. In this model no operator is allowed to be to the left of C. If the farm family chooses a point somewhere between C and B---say D---money can be invested in productive capacity which eventually increases disposable income.[4] Thus the efficiency frontier is actively expanded to $A_1 B_1$, allowing increased consumption, increases savings and investment or both. Schematically, we find a cycle similar to that shown in Figure 7 on the next page.

In the models studied marginal propensities to consume and save are identical in a schedule sense, average propensities to consume are identical among all but model 4. Divergent patterns of investment, however, resulted in different levels of disposable income within any year and, as will be seen in later sections, different levels of consumption, total capital, and net worth.

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[4] If the family is found at some point W, not on the efficiency frontier, we have an example of what Spitze was referring to as unproductive saving which does not automatically become capital (see Chapter II).

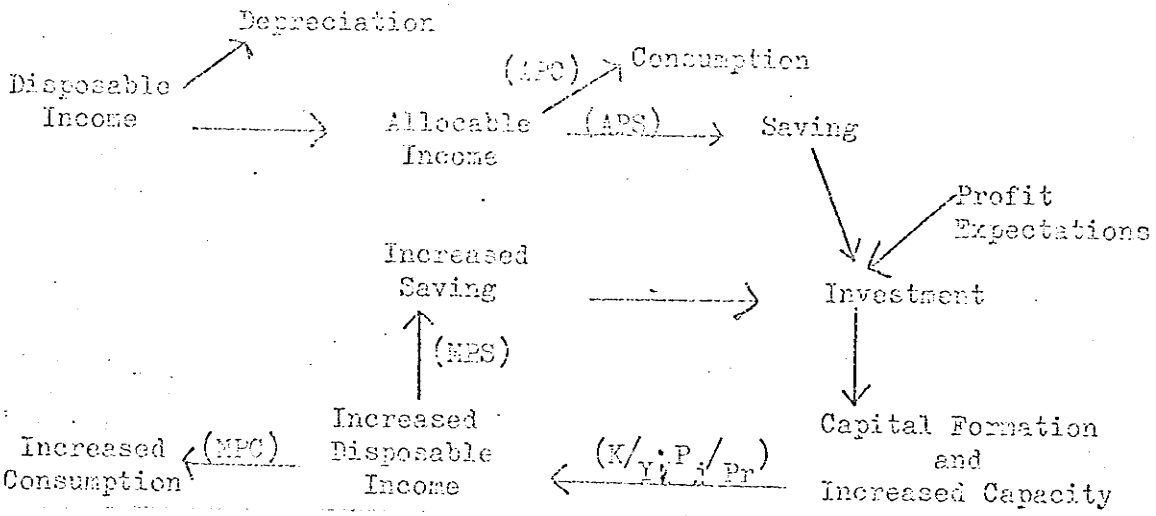

Figure 7. Schematic Representation of the Growth Process of the Firm.[5]

Disposable Income. In figure 8 behaviour of disposable income in the five models can be seen. The nonborrowers consistently produced income levels below those of the rest. The advantages of the unlimited labour supply to model 2 are quite noticeable. Even when profitability declined this farm managed to earn a higher income than anyone else. At times disposable income was up to $3,000 higher than that of model 1.

Uniform trends in incomes of all models can be found: disposable income rose to a peak about 1951-52, declined between 1953 and 1956, recovered briefly for the next two years and then appeared to begin

[5]The designations in brackets refer to important factors affecting the magnitude of the variables at the different stages of the process. APC, MPC, APS, MPS are the average and marginal propensities to consume and save; K/Y is the capital-output ratio; P_i/P_r is the ratio of product prices to input prices.

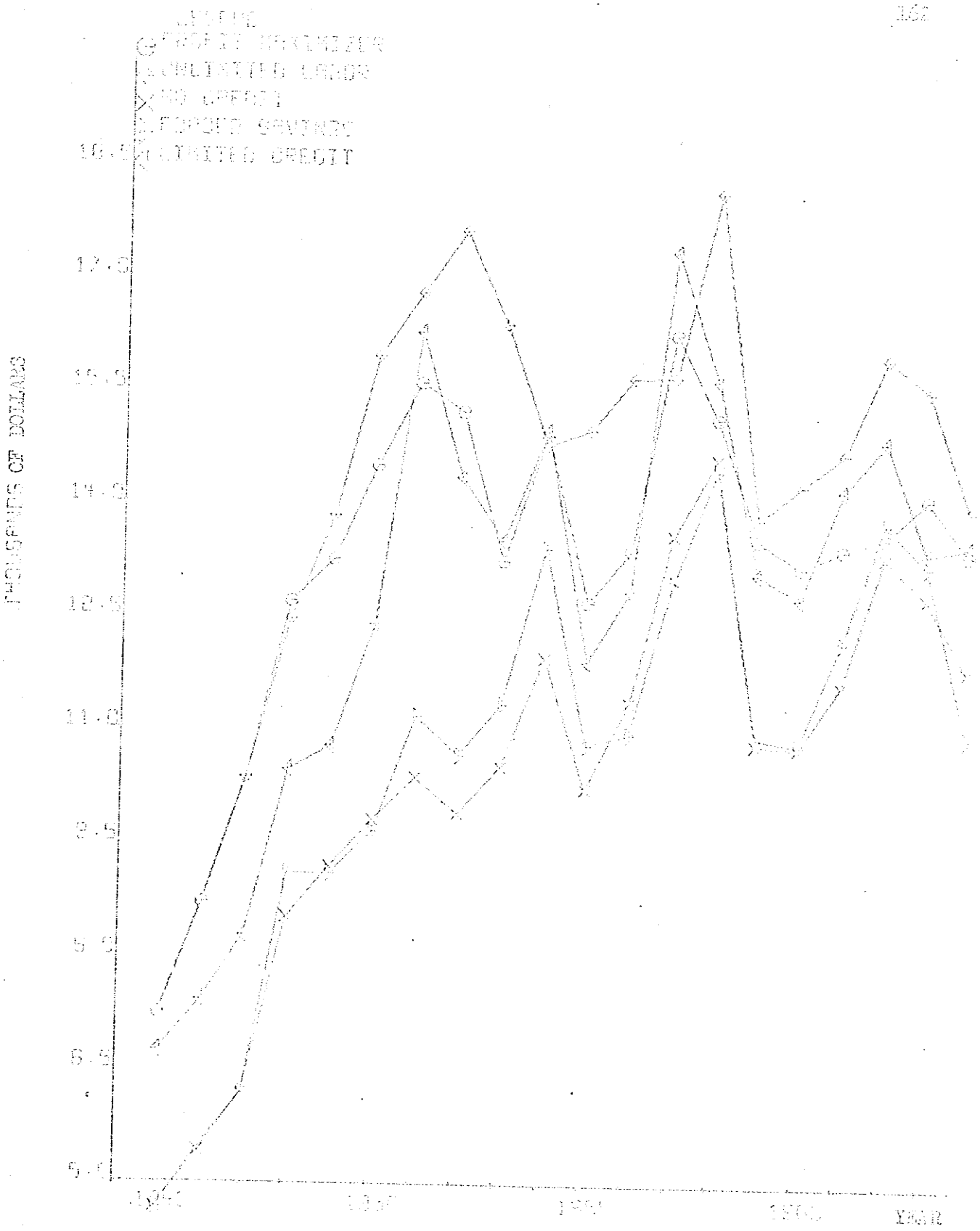

FIG. 8. [illegible]

settling back to the levels of the mid-fifties. Within these general trends income behaved rather erratically, in some cases varying as much as $4,000 from year to year (e.g., between 1958 and 1959 for most models).

It should be mentioned here, though, that actual disposable income represents only part of the picture. There is a problem of realization of expectations on the basis of which investments and production decisions were made. It was claimed earlier that recursive programming models could be employed to demonstrate to farmers the effects of their attitudes towards issues such as those touched on in this study. Table XXI presents expected and actual realized net incomes for selected years of the planning period. (Recall that income expectations were formulated on the basis of actual net incomes which were realized by enterprises in the previous year.)

TABLE XXI

EXPECTED AND REALIZED NET INCOMES FOR SELECTED MODELS AND YEARS

Year	Model	Expected Income	Actual Income	Actual / Expected
1950	1	$24,108	$26,396	109%
	2	28,571	29,029	112
	3	14,535	15,283	105
	5	21,194	22,973	108
1952	1	37,042	27,258	74
	2	45,297	31,575	70
	3	23,013	15,250	64
	5	36,014	26,017	72
1959	1	29,064	21,361	73
	2	33,901	23,977	70
	3	29,127	16,419	56
	5	30,705	20,695	67

The year 1950 is illustrative of periods of rising profitability. In all cases actual realized net income exceeded expectations; in 1952 and 1959 the reverse was true. In each of the three years not only did the nonborrowers' expected and realized income fall far below that of the other models but actual income as a percent of expectations was lower. This was true whether actual income was above or below expectations. The ratio actual income/expected income does not appear to differ significantly among credit using operators, and only in the first few years was there any large difference in absolute levels of expected and of actual income among those models.

The implications of these results for planning are quite important. If the years 1952 and 1959 are representative and the farm model approaches some degree of realism it can be said that nonuse of credit will lead to a greater degree of uncertainty in farm income than will use of credit. If an entrepreneur realizes only between one-half (1959) and two-thirds (1952) of expected net income in years of declining profitability, and is compensated only slightly (e.g., 5 percent in 1950) in years where expectations are exceeded, his capacity adjustment coefficient (see chapter II) is likely to be relatively small. If such nonusers of credit represent a sufficiently large proportion of the industry this may lead to its being in constant disequilibrium in terms of adjustment of aggregate capacity to aggregate required output. Such a situation could also reduce the effectiveness of specific agricultural price policies aimed at governing relative volumes of production within subsectors of agriculture unless such policies provide guaranteed prices.

Nonuse of credit does have certain saving features which accompany it. Comparison of figures 8, 9, and 10 reveals one of them. The considerable variability of income over the period, as indicated in figure 8 has already been mentioned. Relatively favourable terms of trade in the first five or six years created an atmosphere conducive to investment which induced the borrowers to take on medium and long term obligations for what eventually turned out to be overexpansion of productive capacity. Figure 9 shows the debt payment burden shouldered by those who borrowed funds for land purchase and construction. Minimum annual obligations for any of the three borrowers after 1951 were $2,500. For some, payments on debt exceeded $3,000 in a number of years. The result is seen in figure 10 which traces the annual value of liquid capital in each of the five models. While the two non-borrowers steadily increased their cash balances, the other three entrepreneurs experienced a decline in liquid assets. Whether this is desirable is difficult to say. The nonborrowers maintained a much more flexible position, keeping less of their capital tied up in durable assets. The profit maximizers and the cautious borrower, on the other hand, enjoyed additional profits due to capital gains which could be realized with the sale of the farm or some portion of it. The cautious borrower appears to be in an intermediate position between the profit maximizer with limited labour and the two nonborrowers in this respect. Scitovsky (52) and Leibenstein (38) are supported by these results in their explanation of the aversion of many entrepreneurs to external financing of the firm's investments.

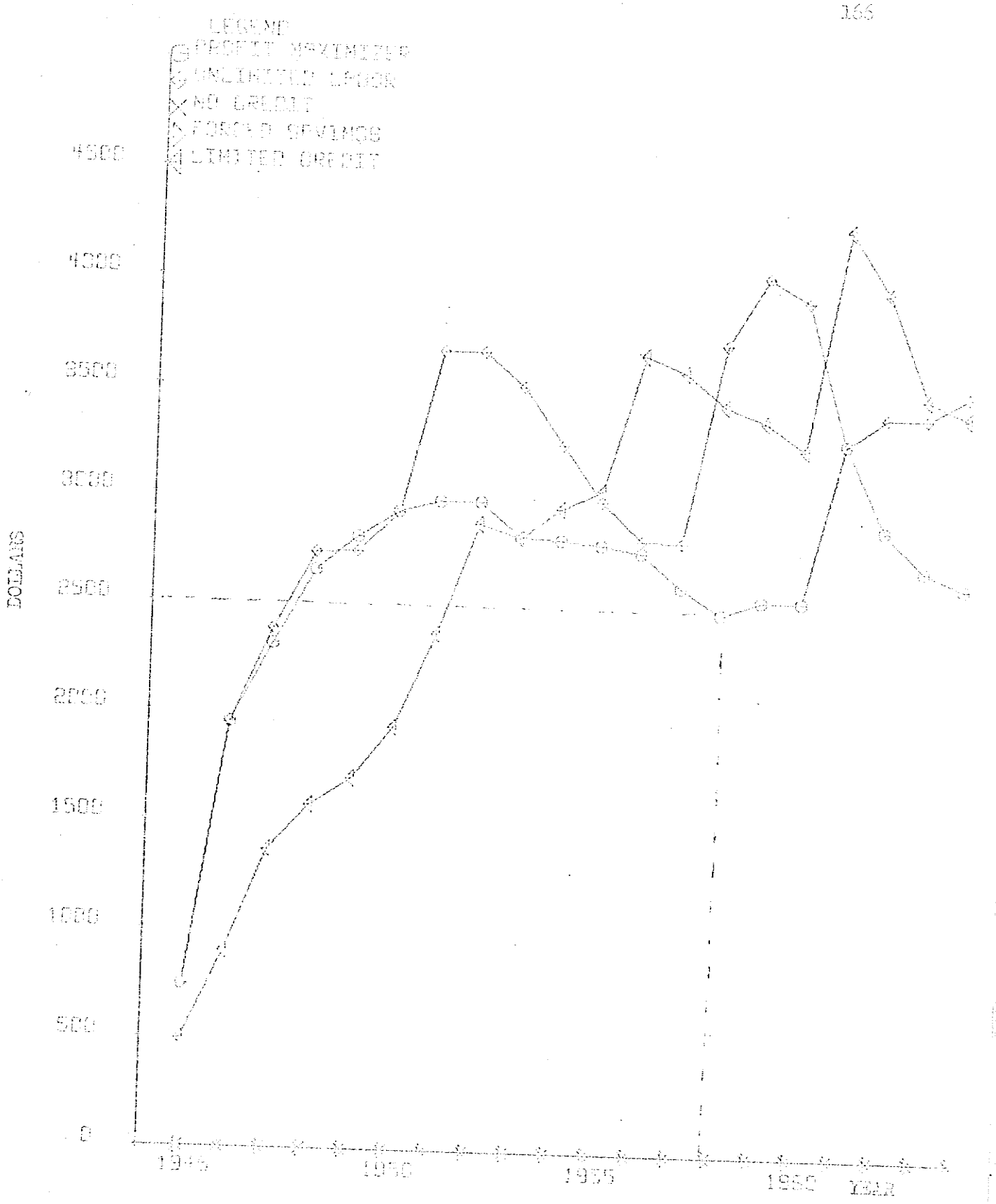

FIG. 9. LOAN PAYMENTS ON OUTSTANDING LOANS

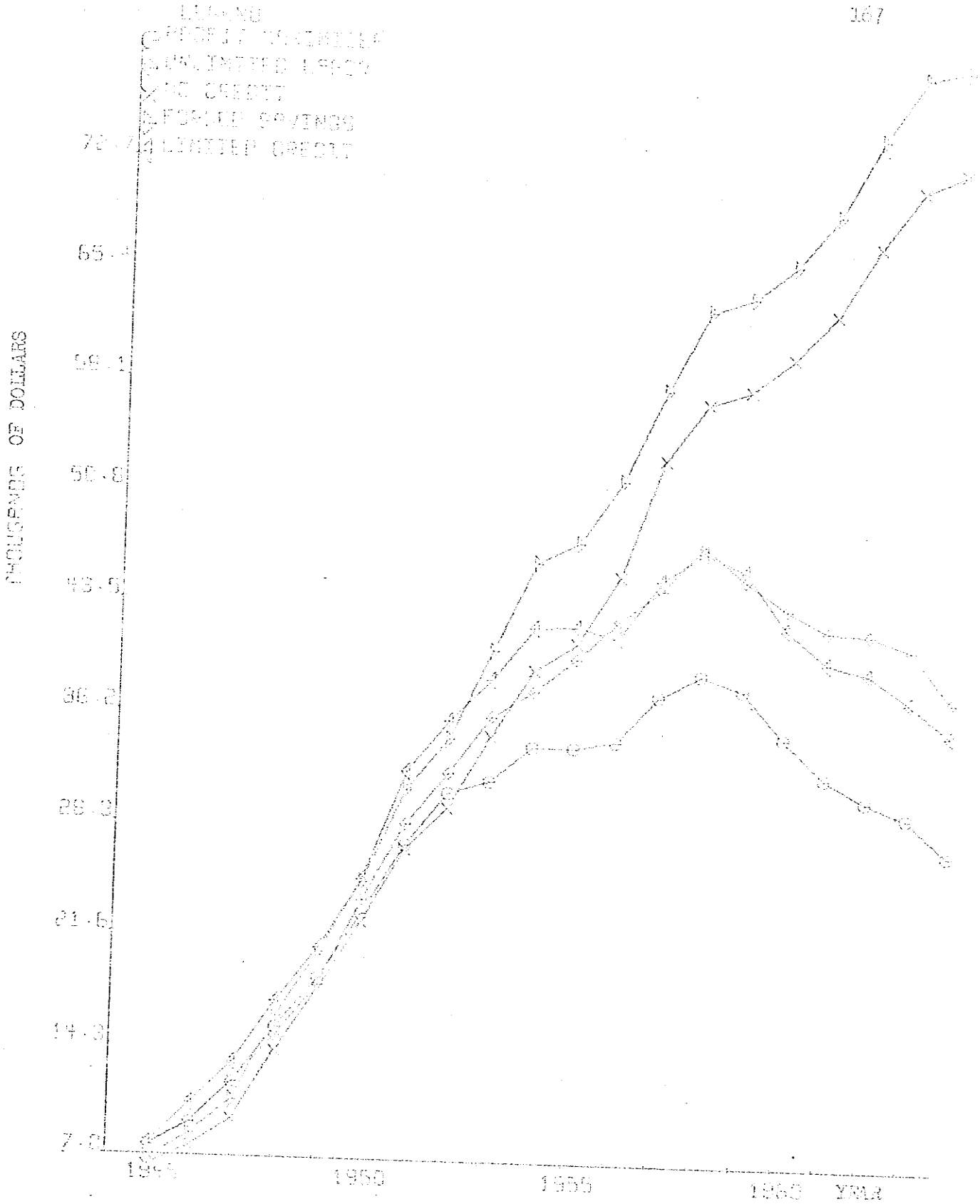

FIG. 10. VALUE OF LIQUID ASSETS, EXPRESSED AS A BANK BALANCE

3. Growth of Consumption

Structure of the consumption function on the basis of which the models patterned their level of living was explained in Chapter VI. Only model 4 differed from the rest in its consumption schedule which was reduced by $500 relative to the others for any set of values placed on the independent variables.[6] General trends in consumption were similar for all models. Over most of the period three distinct groupings can be found: profit maximizers who had the highest level of living; the cautious borrower and the nonborrowers. Figure 11 shows how consumption changed over the twenty year period.

It was to be expected that initially model 4 would enjoy the lowest standard of living. This situation continued for about ten years after which accumulated capital, productive capacity and income allowed him to overtake model 3 and consume at a slightly higher level in the final year than either model 3 or model 5, the cautious borrower. In terms of relative growth of consumption over the twenty years, the farm family which imposed forced savings on itself in the first years raised its level of living more than any of the others. While model 4 consumed in 1964 at a level 411 percent of that experienced in 1945 the others had risen only to between 300 and 380 percent of their levels of 1945.[7]

If an improved absolute level of living is one of the goals of the farm family the results of this analysis indicate that abstaining

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[6] The five independant variables which determined consumption were: net worth, disposable income, total debt, operator age, family size.

[7] The gains are really not as spectacular as they appear. On the basis of consumption per person over the age of 14 they would be considerably smaller.

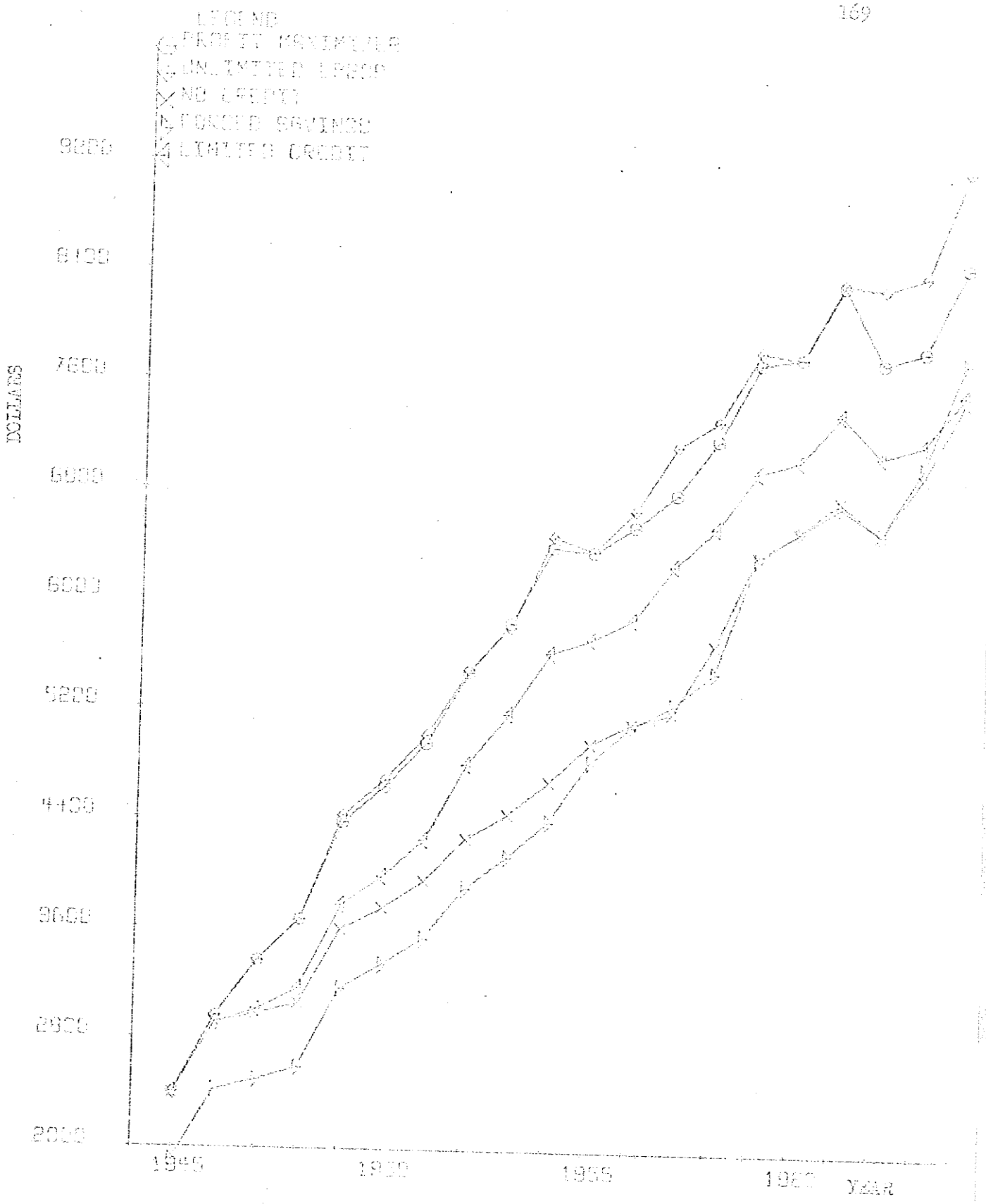

FIG. 11. ANNUAL CONSUMPTION AND LIVING EXPENSES

from use of credit is not the proper means for achieving it. Table XXII illustrates the point quite clearly.

TABLE XXII

LEVELS OF FARM FAMILY LIVING

Year	Model 1	Model 2	Model 3	Model 4	Model 5
1945	$2,409	$2,409	$2,397	$1,897	$2,407
1950	4,646	4,697	3,763	3,351	3,992
1955	6,379	6,385	4,979	4,849	5,733
1960	7,814	7,817	6,547	6,547	7,060
1964	8,493	9,198	7,509	7,795	7,563

In 1945 consumption levels were almost identical. By 1955 there was a difference of over $1,000 between the profit maximizers and the nonborrowers. Between the nonborrowers there was a difference of less than $200 despite the lowering by $500 of the consumption schedule of the family practising forced saving. Towards the end of the period the level of living of the operator represented by model 2 began to show a marked upward surge relative to that of model 1 in which the labour supply was limited.

4. Capital Accumulation

a. Value of Capital Assets. Capital accumulation in terms of growth of productive capacity was discussed at the beginning of this chapter. There the relation between investment and profit expectations was shown. Now the second facet of capital must be treated: capital as wealth or

potential purchasing power.[6]

Capital value is built up through investment (including maintenance of a depreciation fund) and through increases in the value of existing assets which are caused by shifts in supply or demand for durable assets. In inflationary economies where loans are not linked to an index value or to the general price level it is very profitable to use credit to purchase durable assets. Depending on the rate of inflation the producer will be able to pay off the loan in a relatively short time at a fraction of the real price which the asset originally cost. If the producer takes the inflationary trends into consideration he will invest in productive capacity at a faster rate than if he were governed by expectations of stable prices. In terms of Leibenstein's model of growth of the firm, his discounted profit curve p'p' would rise, moving closer to the profit curve based on the theoretical long run average cost curve. The reason for this lies in the reduced real cost of credit.

In the process of growing for the sake of profits--approaching optimum physical capacity which will yield maximum profits--in an inflationary period the operator simultaneously would be enlarging his stock of wealth, his retirement fund. This allows him to compound the growth of value of capital through capital gains. Indeed, it is possible that in many cases farmers invest in production assets (primarily land) more for speculative

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[6]The model set no specific goals or constraints regarding a target value of capital at the end of the period, although this could be done through reformulation of Haavelmo's planning model, defining consumption as a residual and value of capital and investment as the variables for which the model supplies values (see chapter 2).

purposes than for reasons of efficiency.[9]

In this model the value of land almost tripled within the 20 year period examined. Building values more than doubled. The rate of increase of capital values, however, was not constant. Land prices doubled within the first seven years; those of buildings increased at a much slower rate. It is obvious, therefore, that entrepreneurs who made large investments in durables relatively early in the period should have enjoyed both the use of expanded productive capacity at a time when profits were relatively high and the benefits of large capital gains as demand for farm assets grew in proportion to supply. Figure 12 shows the growth of value of total farm capital (including cash reserves) during the twenty years of operation. The grouping of farm capital growth is similar to that for consumption. From a common initial capital value of about $20,000 at the end of 1944 the two profit maximizers increased the value of their assets (including capital gains) very rapidly to about $140,000 in 1954 and then more gradually to the end of the period when model 1 had assets valued at over $170,000, and model 2 assets worth over $180,000. At the same time the cautious borrower's capital grew more gradually, reaching $145,000 in 1956. The rate of growth tapered off more slowly beyond that point than it did in the case of models 1 and 2, so that by 1964 total assets of model 5 had a slightly higher value than those of model 1. Rate of growth of capital with respect to time (dK/dt) for the nonborrowers

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[9] Pension funds and private individuals view this as normal practice in their attempts to assure desired levels of future consumption; many private individuals speculate in real estate, both urban and rural, while pension funds allocate a portion of their investments to growth stocks and convertible corporate bonds.

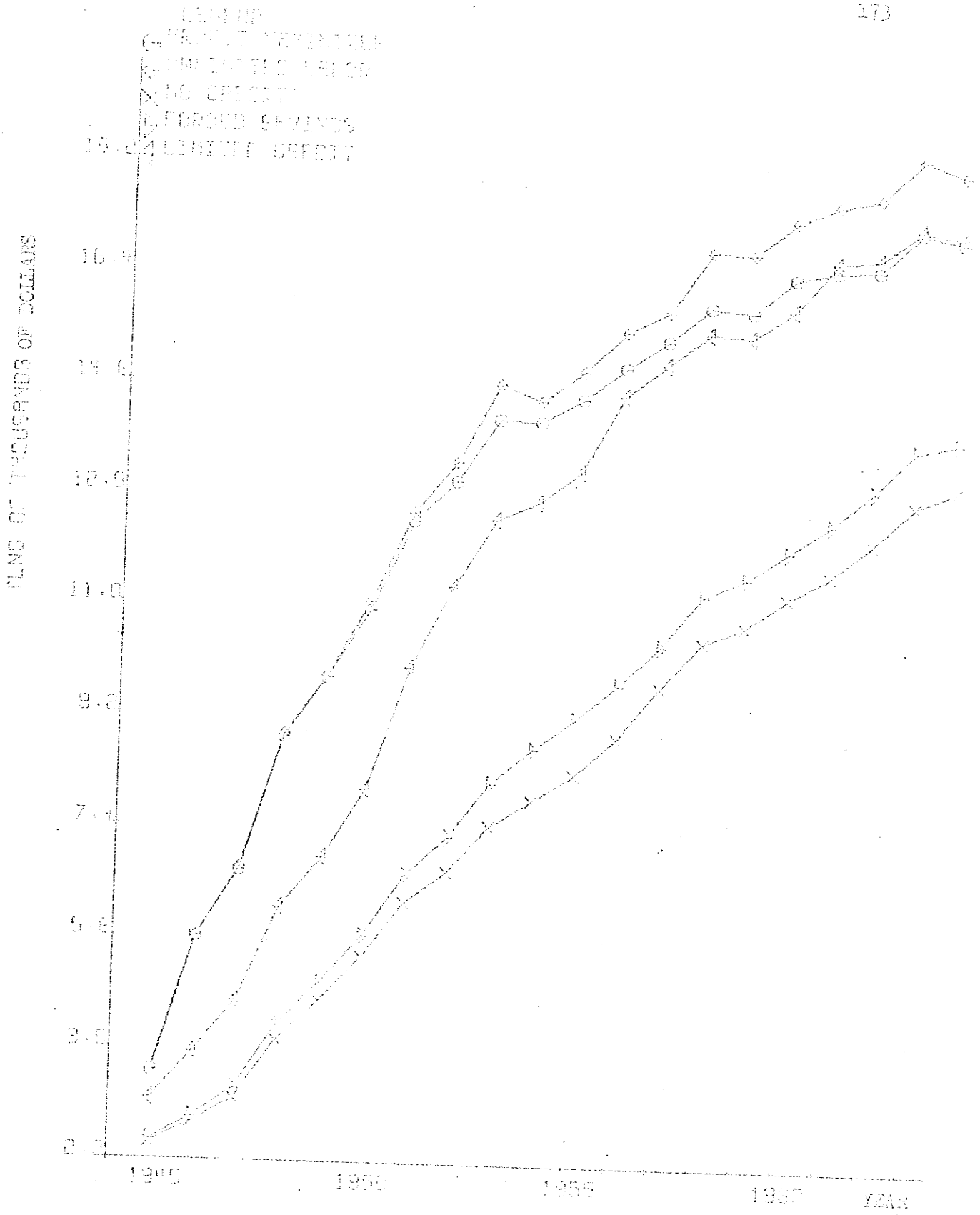

FIG. 12. VALUE OF TOTAL FARM CAPITAL, INCLUDING CASH RESERVES

was almost constant throughout the period. Capital value had grown by 1964 to $130,000 in the case of model 3, and almost $140,000 for model 4.

b. Capital gains. The above values cannot be construed as representing growth of physical capital. By 1964 close to half of the value of total farm assets of the profit maximizer had accumulated through capital gains. In the case of the nonborrowers less than one-fourth of total capital was due to capital gains, while slightly more than one-third of the value of the cautious borrower's assets had been created by increased market values. The reason for the differences in capital gains among groups lies in (a) the differences in composition of capital assets, and (b) the period in which most assets were acquired. Land, machinery, and buildings appreciated in value considerably over the first ten years. The profit maximizers had already tripled their land holdings by 1950 (see table XIX), thereby benefiting considerably from the steep rise in real estate values. The nonborrowers concentrated their investments in hog buildings which they constructed gradually over most of the period. The cautious borrower added both to land and to buildings almost on a year to year basis. Table XXIII shows the distribution of value of total assets among land, buildings, machinery, and liquid assets (such as marketable grain, livestock, etc.) which were expressed as a cash balance. Table XXIV illustrates for selected years the relation between total current capital value and capital gains.

An outstanding feature of table XXIII is the relative importance of cash or liquid assets as a capital component in the three models. Throughout the period the nonborrowers maintained close to one-half of their capital

TABLE XVIII

VALUE OF CAPITAL COMPONENTS ON SELECTED FARMS

Year	Model	Land	Machinery	Buildings	Cash	Cash as % of Total
		Thousands of Dollars				
1950	1	53	20	14	23	21
	3	16	7	8	23	43
	5	28	10	17	25	31
1955	1	63	24	23	34	24
	3	19	8	15	41	49
	5	45	17	28	42	32
1960	1	72	30	27	35	21
	3	22	10	21	60	53
	5	59	25	32	42	26
1964	1	83	33	27	28	16
	3	25	11	22	73	56
	5	73	30	33	35	21

in liquid form. This sharply reduced the possibility of achieving large capital gains. On the contrary, the real value of money declined over the period in terms of physical productive capacity which it could purchase.[10] The profit maximizers ended the period with about 16 percent of their capital in cash; the cautious borrower with slightly more than 20 percent.

Advantages accruing to the nonborrowers from their position are quite important:

i. If they were to liquidate the operation at the end of 1964

[10] In 1964 model 3 had $73,000 in cash. That money could buy roughly only twice the amount of land and necessary machinery which the operator could have purchased with the $23,000 he had on hand in 1950.

TABLE XXIV

TOTAL VALUE OF FARM CAPITAL AND CAPITAL GAINS COMPONENTS*

Year	Model	Constant (1945) Value of Capital	Cumulative Capital Gains	Total Current Value of Capital
		Thousands of Dollars		
1950	1	76	34	110
	3	41	12	53
	5	59	21	80
1955	1	93	51	144
	3	65	18	83
	5	100	33	133
1960	1	97	68	165
	3	88	24	113
	5	111	48	159
1964	1	89	82	171
	3	102	29	131
	5	112	60	172

*Inconsistencies between the sum of the components in this table and total current value of capital in table XXIII are due to rounding errors.

they would probably have a far broader selection of potential buyers than there might be for the larger farms where financing of a purchase of that size could prove problematic. In the event of a temporarily depressed market for farms their relatively strong cash position would allow them to wait out the slump.

ii. Transfer arrangements between father and sons interested in continuing in farming would be facilitated by the high degree of liquidity. Division of the farm assets could be carried out with far less loss of production efficiency than would be possible where a majority of assets are in the form of land and buildings.

iii. In a period of rapidly changing technology, in terms both of rate of introduction of innovations in equipment and structures and of appearance of new types of enterprise, the nonborrowers who continue to farm beyond 1964 would be able to act fairly quickly and invest in new technology where profit expectations warrant it. Similarly, they would be more flexible with respect to availing themselves of off-farm investment opportunities.

iv. In periods of declining profitability the burden of maintaining existing capital through allocations to depreciation is far lighter. The fact that depreciation costs for models 3 and 4 were less than half those for the other models from 1956 onwards certainly was a contributing factor to the difference in the growth paths of value of liquid assets illustrated in figure 10.

Depreciation and Capital Gains. It has been suggested that capital gains serve as supplementary income to farmers (19). Chapter III showed that capital gains in themselves mean nothing unless one knows how other relevant price levels behaved over the same period and, specifically, what the real purchasing power of the capital gain is once the appreciated asset has actually been sold. An additional aspect of the problem must be examined here before the true value of inflation and capital gains to the farmer can be ascertained. In this study it was assumed that allocation to depreciation was not simply a bookkeeping operation or a tax ploy, but that funds were actually invested annually in machinery and/or buildings in order to maintain their full production capacity. This was done re-

gardless of whether excess capacity existed or not.[11] In fact an annual transfer was made from liquid to nonliquid assets within the firm, maintaining a certain level of assets but also reducing flexibility and maneuverability with respect to investment opportunities. Table XXV shows levels of depreciation payments for selected years and models.

TABLE XXV

DEPRECIATION ON MACHINERY AND BUILDINGS[1/]

Year	Model 1	Model 3	Model 5
1945	$ 903	$ 624	$ 793
1950	2,675	1,070	1,852
1955	3,518	1,544	3,086
1964	4,641	2,184	4,625
Total Depreciation Payments for Period[2/]	66,235	29,379	58,568

1/ Calculated on the basis of replacement values.
2/ Total annual payments only, not compounded value of payments.

Current values of depreciation payed by farmers totalled between $30,000 (model 3) and $66,000 (model 1) in the twenty year period. Cumulative capital gains totalled between $30,000 and $82,000 respectively.

[11] Repair costs and wear and tear due to physical use of machinery or buildings was included as an operating cost in each activity and was paid only if the activity entered the production plan. In reality farmers do not necessarily pay out, say, 15 percent of the value of their machinery and 5 or 10 percent of the value of buildings in each year. They may buy only new machinery one year and only repair buildings the next. On the average they will usually allocate depreciation costs approximately in the proportions designated in the farm accounts.

The two sets of values are not comparable though; this for two reasons:

1. Arithmetically, cumulative capital gains represent compounded values while depreciation payments are simple values, payed annually and added over the entire period. Therefore, the $30,000 of depreciation payments made by model 3 represents a much larger amount than the $30,000 in capital gain which the operator could realize in 1964.[12]

2. Theoretically, depreciation costs are incurred to maintain a given level of productive capacity and are not made as a speculative investment based on expectations of capital gains. If this is true, one would expect that in years when existing capacity is not fully utilized because of declining profits or profit expectations, rational operators would, under conditions of certainty of expectations, disinvest by reducing their depreciation payments.[13] The difference between costs of maintaining an economic level of productive capacity in any year and payment made to maintain the full value of capital assets can be thought of, therefore, as a speculative investment based on expectations of capital gains. Speaking practically it would be difficult to estimate empirically the magnitude of this speculative investment cost.[14] However, it is clear that nominal

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[12]The $1,070 in depreciation payed in 1950 would be worth $2,070 in 1964, if compounded at 4.5 percent, the rate of profit allowed on off-farm investment in the model.

[13]It would be difficult to sell buildings or portions of buildings and might not pay to sell a partially utilized machine if it necessitates buying custom services. Thus, in practical terms disinvestment here means nonpayment of depreciation.

[14]Under conditions of certainty of expectations an approximation of speculative investment costs might be based on the proportion of unused capacity to total capacity. The speculative investment would be a similar proportion of total depreciation costs for the underutilized asset. Where uncertainty enters the picture and the question of future required capacity is not as clear as when expectations are certain separation, even notionally, of depreciation from speculative investment becomes virtually impossible.

capital gains are far larger than real capital gains once allowance has been made for the above mentioned costs and erosion of the purchasing power of money. It is with the compounded value of the speculative investment component of depreciation that the real gain component of nominal capital gains should be compared.

c. Growth of Net Worth. From the point of view of capital as stored future consumption net worth represents an important planning variable for the farm operator and his family. Chapter IV mentioned that most definitions of the family farm include a requirement that the firm have "a sufficient resource base to provide an 'adequate' level of living." The terms "sufficient" and "adequate" are relative, therefore, dynamic. A sufficient resource base in 1920 may be totally insufficient in 1960. Adequate levels of living and differentiation between basic necessities and luxuries have also changed with time. Galbraith talks of the possibility of having to control half a million or a million dollars worth of assets in order to operate an average unit. Magnitudes of this order preclude, in many cases, attainment of full ownership of the firm's productive assets. Nor is it necessary. If the purpose of accumulating net worth is to guarantee consumption after retirement at as high a level as that enjoyed just previous to retirement, then required equity upon retirement need not exceed an amount which when invested will yield an annual net return sufficient to ensure that level in real terms. Whether consumption after retirement progressively depletes the basic capital stock (based on an estimate of life expectancy) or is derived solely from profits, leaving the nest egg intact is a matter of personal decision.

Assume that the operators in this study retired in 1965 at the

age of 55. Assume also that upon retirement or shortly thereafter all children become independent of the parents. One of the effects of this would be to lower consumption expenditures of the operator. Assume arbitrarily that annual living costs fall by $2,000 when the children leave. Table XXVI shows the approximate new level of living (based on table XXII) and the investment necessary to finance the expenditures under the assumption of net yields of four percent and seven percent.

The table indicates that in all five models equity at the end of 1964 would be sufficient to maintain an acceptable level of living during retirement, provided a net return of slightly more than five percent could be obtained.

Five percent is the lowest rate of interest charged by any of the credit sources in the model. Thus, if the parents transferred the farm to one or more of the sons upon retirement, they would be able to subsidize the initial stages of development of the children's enterprise and still not deprive themselves of the comforts they desire.

TABLE XXVI

LIVING EXPENSES AFTER RETIREMENT AND INVESTMENT NECESSARY TO FINANCE THEM

Model	1	2	3	4	5
Consumption	$ 6,500	$ 7,200	$ 5,500	$ 5,800	$ 7,600
Investment yielding 4%	162,500	180,000	137,500	145,000	190,000
Investment at 7%	92,950	102,960	78,750	83,940	108,680
Actual equity--end of 1964	153,688	163,723	130,737	138,531	143,262
Total capital--end of 1964	170,992	181,946	130,737	138,531	171,735
Equity as percent of capital	90	90	100	100	83

Even if their retirement fund returned a net profit of only four percent per year the value of total capital deemed necessary by the profit maximizers to operate the farm efficiently would exceed that was needed for annual consumption. Therefore, they would be justified in maintaining some level of debt right up to the point of retirement.

SUMMARY

Resource Allocation and Growth

The model demonstrated through simulation that different attitudes to use of credit and hired labour and to consumption cause farmers who face identical production functions and possibilities as well as similar external economic conditions, to organize their enterprises differently. This, in turn, influences resource allocation, rates of investment and growth, utilization of capacity and, ultimately, levels of income, consumption, capital accumulation and net worth.

Differences in creation of productive capacity (table XIX) were compounded through the effects of price expectations on production decisions. Interaction of the two influenced levels of resource utilization (table XX). Absolute production capacity and its planned utilization created specific patterns of income expectations and fairly characteristic ratios of actual to expected income (table XXI). The nonborrowers suffered most in this respect, actual earnings falling much farther below expectations in poor years, relative to other operators, and not exceeding expectations by very much in years of improved profits. Such great variability of income relative to expectations would normally have serious effects on an entrepreneur's decisions regarding investment in durable assets. Nonuse of credit can

therefore lead to undercapitalization of the firm (insufficient productive capacity) not only because of internal rationing but also as a result of heavy discounting of expected profits.

Distribution of total capital among livestock producing durables, crop producing durables and liquid assets varied considerably among the three basic groups (table XXIII). The relatively large proportion of liquid assets held by the nonborrowers reduced the possibility of benefiting from capital gains but saved them from paying out large amounts for depreciation on facilities which were underutilized in years of reduced profits.

Lack of debt meant no burden of loan payments in years of low income. Reduced realized net incomes beyond 1958, coupled with large fixed obligations in the form of depreciation, land taxes, and debt retirement reduced the cash balances of all the borrowers (figure 10) leaving them in a much less liquid position than the nonborrowers in 1964.

A direct correlation is to be found between use of credit and consumption levels in the model (figure 11 and table XXII). Towards the end of the period it appeared that model 4, whose consumption schedule was $500 lower than all other models, was beginning to enjoy an absolutely higher level of living than both model 3 and model 5, the cautious borrower. The practice of forced saving which meant a lower level of living in the first years finally began to return dividends.

Value of farm capital grew much more rapidly for the borrowers than for the nonborrowers (figure 12). The approach of the cautious borrower who always maintained a debt/total capital ratio smaller than one-third did not impair this operator's ability to grow. His ultimate capital value in 1964 was similar to that of the profit maximizer with

limited hired labour. Value of nonborrowers' capital in 1964 was about twenty-five percent less than that of the borrowers. In terms of physical capital, however (value of capital in terms of 1945 prices) nonborrowers had more than the profit maximizers (table XXIV). This is due to relatively large investments in feeder hog barns (table XIX) which exceeded borrowers' feeder hog capacity by over fifty percent. Land area held by nonborrowers in 1964 was less than one-third the holdings of any other operator.

Nonborrowers ended the twenty year period with a net worth of between twenty and thirty percent less than the borrowers (table XXVI). While their level of consumption was decidedly lower, their flexibility was much greater in terms of ability to invest in new technology on the farm or to take advantage of off-farm investment opportunities. Another interesting development in the nonborrowers' firms was their much lower dependence on a land base for income. One might even go so far as to say that they became agricultural industrialists, producing hogs on a very large scale, buying the majority of their feeds and other inputs, and often renting out large portions if not all of their land.

Recursive Programming as an Extension and Planning Tool

The present exercise has demonstrated that recursive programming has a place as an illustrative and explanatory tool with which extension workers and farm management consultants can indicate to entrepreneurs what the tangible results might be of certain approaches to farm decisions. Here we have used only two or three approaches or attitudes. However, the same approach can be used to study the effects of slow or rapid adoption

of new technology, different manners of formulation of price (or net revenue) expectations, placing limitations on rate of expansion of capacity or rate of investment in general, and many others.

Recursive programming has been used already to test the effects of proposed government policies on farm incomes, resource allocation, and enterprise mix.[15] It can be useful in any planning situation where linear programming is accepted as a useful tool and where the necessary input-output coefficients and price information can be obtained economically.

The model used here can be described as being one-way recursive. Constraints for the problem in year t are formulated on the basis of the solution for year t-1. Within this system there is only backward dependence--what was executed in previous years influences solutions for all periods following. In effect a series of backwardly dependent local maxima are found. Although the solution for each year provides an optimum for that specific period, based on capacity created through previous investment decisions, it is highly unlikely that the objective function will be optimized over the entire planning horizon, because of postulated unforeseen changing conditions.

The one-way recursive model can also be used for planning future development of the farm firm. The basis for such a plan would be tenuous, to say the least, but to the extent that an entrepreneur plans at all he must estimate future parameters--be they prices or technological coefficients. Once he has accepted these at some level of statistical or subjective confidence this type of recursive programming can provide him with as much

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[15] Heidhues, Theodor. "A Recursive Programming Model of Farm Growth in Northern Germany," JFE, XLVIII (August 1966), 668-84.

information as conventional linear programming or dynamic linear programming and certainly as much as budgeting. By periodic revision the plan could be updated and indicate what the future may have in store.

Weaknesses of the Model

The model used in this study was developed to demonstrate its practicality as an extension tool. It was not intended to be used for purposes of projection or to test the validity of present extension approaches. For this reason some recognized weak points in its formulation were ignored in analysis of the results. They would detract from the reality of the model if it were used to analyze an actual farm situation or to serve as a portion of an aggregate supply model. Most of the points which will be mentioned below have been discussed in detail in Chapter V.

1. No provision was made for embodying technical progress in new capital or in assets which were replaced (at replacement cost) through the depreciation fund. Over a period of twenty years it is to be expected that innovations and technical improvements would be introduced in machinery and equipment sold to the farmer. This, along with influences of extension services, new varieties and breeds should be accounted for in a realistic model, either through changing input-output coefficients or through increased expected and actual yields and not revenues.

2. Throughout the period studied no attempt was made to introduce new techniques or untried enterprises. Using an approach similar to that found in Leibenstein's model of growth of the firm, expected net revenues of activities could be relatively heavily discounted for risk and uncertainty until the enterprise or technique is adopted.

3. In some of the models studied (especially the profit maximizers) large fluctuations could be found in utilization of capacity from year to year. This in itself may be rational in the light of relative expected returns to limiting resources. There were cases, however, where in one year productive capacity remained largely unutilized and yet, in the following year relatively large investments were made in capacity of the same type. It would be advisable to link net investment in an enterprise to some measure of capacity utilization in the previous year.

4. Effects of poor weather disturbances such as disease and other random shocks could add to the realism of a model. Perhaps one of the reasons that the nonborrowers were able to grow at a gradual pace and avoid a low-level equilibrium trap was the absence of stochastic events which normally would damage a small farm severely, at times even forcing it to eat into its capital assets to survive.

5. There is room in a model of this nature for some integer formulations. It is not logical in the real world that a farmer buy land in ten-acre pieces or build livestock structures 15 square feet at a time. Linear programming in its conventional form works on an assumption of complete divisibility and allows such occurrences. Proper formulation can prevent it.

CHAPTER VIII

SUMMARY AND CONCLUSIONS

The effort invested in this study stemmed from a growing realization that the phenomenon of capital accumulation and growth is one of the keys to understanding the problems of Canadian agriculture today and to their solution. It was motivated by the desire to contribute to the resolution of the apparent conflict between the expanding and changing physical structure of farm capital and the unchanging financial structure of Canadian farms.

The working hypotheses which guided this work involved analysis both at the aggregate level and that of the individual farm unit. Those pertaining to the aggregate were examined at the provincial level by analysis of sectoral data, mainly gathered by the Dominion Bureau of Statistics. Three principal questions were posed with respect to the aggregate figures:

1. Is there evidence to support the contention that sectoral overcapacity of production exists in Canadian agriculture, while many individual farms suffer from insufficient size?

2. Is there a positive relation between capital and farm income and farm income and capital gains?

3. Can (or should) capital gains be considered as supplementary income, raising farmers' earnings to an average level higher than that usually assumed to exist within the sector?

At the individual farm level a recursive programming model was employed to examine the following multifaceted question:

Given a number of farms which begin with an identical resource base, similar production functions and possibilities and face the same exogenous conditions, how will different attitudes to credit, employment

of hired labour, and consumption (in the schedule sense) affect

a. farm organization and resource use?

b. income levels?

c. consumption and its growth over time?

d. accumulation of capital assets (productive capacity) and net worth?

e. capital gains?

Sectoral Analysis

An analysis of changes in capital investment in agriculture and resulting production indicates that the number of farms has been in constant decline for the past thirty years, as has farm population. During the same period aggregate farm capital, measured in constant values, has remained relatively constant. The value of production in that period (at 1935-39 prices) rose continuously, according to Kulshreshtha (37), to a level over 75 percent higher than the average for the years 1935-39. Productivity rose in a similar manner. Increased production and productivity have been the result of the interaction of a number of factors including research into improved varieties of most of the major crops and livestock as well as the development of better methods of pest control and fertilization. An important factor in the growth of production and productivity has been the technological change evident throughout the sector. This change, coupled with a shift in the capital labour wage ratio has led to the development of cultivation methods which benefit from economies of size.

The growth of average farm size from 224 acres in 1931 to 404 acres in 1966 is indicative that such economies in fact do exist. The fact that over 50 percent of all farms exceeded 200 acres in 1966, versus

only about 30 percent in 1931 and that the total number of farms fell by 40 percent in the same period points to a degree of mobility among farmers. However, the existence in 1966 of more than 50 percent of all farms which sold less than $5000 worth of products implies a serious income problem for many producers. Assuming a ratio of one half between net and gross income this would mean that more than half of all farm families derive an income of about $200 or less per month. Even for a bachelor little would remain after consumption for saving and investment.

Chapter III of this study, coupled with the findings of Kulshreshtha indicate that Canadian agriculture has managed over a period of more than three decades to increase total production greatly, while maintaining a relatively constant capital base. Farmers attained the much higher level of productivity through farm consolidation and reallocation of resources, mainly with respect to land, machinery, and labour. This indicates that sufficient if not excess aggregate capacity does exist in Canadian agriculture. At the same time, however, disparities in income among farm sizes and among regions in Canada signify the existence of a definite problem of farm size for those at the lower end of the scale.

The relationship between value of capital assets and farm income, although evident on the surface, is not really clear-cut. There are several exogenous factors such as weather and prices which cloud the true correlation. Even though a function could be estimated between capital and production in a given year the influence of the structure of a firm's balance sheet may weigh heavily on income after all expenses including interest are deducted. Changing terms of trade often are as important as capital stock in determining the returns to a farm operator. This was

demonstrated with greater clarity in the results of the recursive programming simulation of Chapter VII than in Chapter III. What might be postulated from the analysis in Chapter VII is that there is probably a lower bound (perhaps differing for each farm type) below which growth of the firm is not to be expected. Farms below this threshold value might be caught in Leibenstein's low level equilibrium trap.

Nor was the correlation between level of income and capital gains clear at the level of aggregation employed. Regionally, it can be said that capital gains rise with income, indicating demand pressure on those farms or land in those areas where agriculture appears to be most successful.

The inconclusive answer obtained to the second question, regarding the relationship between income and capital and capital gains and income does not mean that there is no well defined and recognizable correlation. It simply means that the level of aggregation at which the analysis was conducted was too high. A suggestion for further research on problems of farm size, growth, income, and farmer mobility would be that such studies be stratified according to regions or provinces and farm types.

The answer to the third question on capital gains as a supplement to farmers' income is quite definite. First of all, the concept of capital gains implies a money illusion and should be exchanged for that of real gains. Examination of real gains shows that they are subject to high variance over time and their ultimate realized magnitude depends heavily on the timing both of investment and of disinvestment or sale of the asset. The uncertainty involved in estimating ultimate real gains from capital assets would require a very high discount factor which would, from the point of view of allocation of disposable income between investments and consumption, have a negligible effect on decisions.

The recursive programming models demonstrated clearly that different attitudes to use of credit and hired labour and to consumption, lead to different enterprise combinations and varying patterns of resource allocation which in turn affect rates of investment and growth, levels of income and, therefore, consumption, capital accumulation and ultimate net worth. A major difference between users and nonusers of credit appeared in the composition of their respective balance sheets. Those who would not borrow had a large proportion of capital in liquid form. This, of course, meant that they benefitted less from capital or real gains but were much more flexible in terms of their ability to switch from one enterprise to another. Similarly they bore no burden of debt repayments in years where profit expectations were not met.

Of interest is the fact that operators who were willing to use all credit available to them, in fact never did. In a number of years they exhausted all available short term (one year) loans for feeder cattle but they never fully utilized the credit available for buying land and machinery or for construction of buildings. This apparently was not the economic thing to do. That is the reason that the cautious borrower, maintaining a debt/total capital ratio of one-third or less was not impaired in his ability to grow.

Nonborrowers ended the twenty year period with net worth of between twenty and thirty percent less than the borrowers. Their ultimate level of consumption was also lower. It is also interesting to note that they depended much less on a land base for their economic activities. They concentrated on livestock production for which they bought, rather than

raised, the necessary feed grains. Often they rented out most of their land and utilized a maximum of labour and cash for raising hogs

Conclusions

The study demonstrates the usefulness of recursive programming both as a planning tool and as means by which extension workers can demonstrate to farmers how their attitudes affect farm growth and production. The method is a simple one, provided necessary input-output information is available. It can be employed as an analytical tool to examine many facets of individual approaches to economic decisions. One of the more interesting studies might be an analysis of the effect of varying price expectations on production and investment decisions. This could be conducted linking the linear programming algorithm to a random number generator which would supply yields and prices for calculation of realized income.

A study of this type could be done at two levels. The first part would include a recursive analysis within the year, showing the effect of the difference between reality and expectations on production and investment decisions at various stages between the initial plan and final harvest. The second part would be similar to the analysis done in this study.

Other topics which could be amenable to analysis with recursive programming are: the influence of various agricultural policies on the development of farms; effects of attitudes toward innovations and new technology on growth of the firm and maintenance of a competitive position; effects of various forms of transfer arrangements, family incorporation, and perpetual debt on production and growth of farms after retirement of

the father.. Long term effects of changing credit policies also lend themselves to study with this tool.

The aggregate analysis of Chapter III suggests that the conventional concept of the family farm is becoming obsolescent, that in fact research and policy must be directed at formulating a new concept of an agricultural unit to replace the family farm. This institution rendered an important service to Canada's economic development in the past but today may only fit certain types of specialized enterprises in the light of the far-reaching changes in technology and the nature of economic activity which have come about since the days of homesteading. Investments of between $150,000 and $500,000 envisaged by many for farm production units of the next decades imply a radical change in the organization of such firms. Among others alteration in financing techniques and separation of management, ownership, and labour will probably be required. In order to formulate the broad new policy for capital and credit in agriculture which will be needed to facilitate the necessary structural changes which must come, many studies must be carried out to provide the information on which such a policy must be based. They should relate to farmers' mobility, their attitudes to incentives, their goals and means of attaining them in sectors other than agriculture, as well as to technical questions of economical farm sizes for different types of enterprise.

The relation of capital to income and the role of real gains in achieving farmers' goals, as well as their relation to capital and "conventional" income was not clearly defined in this study. Future research on the subject should be done at a lower level of aggregation and stratified by farm types and agricultural regions (not necessarily coincident with provinces).

The question of farmer mobility is closely tied to the market mechanism which determines farm values acceptable to both the buyer and the seller. This study indicates that income expectations are not an effective indicator of what farm prices or capital gains might be in a given area. Research into the nature of the mechanism determining prices of farms and farm assets could both contribute to a solution of the problem of farmer mobility and provide important guidance for determination of an intelligent approach to capital gains and their taxation.

Probably, it will always be the aim of a government to achieve high resource productivity in any sector and thereby encourage accelerated economic growth for the economy as a whole. For Canadian agriculture it appears that to achieve this, emphasis should be placed on outward mobility of small and marginal producers, expansion of small, uncompetitive farms to a scale which can benefit from economies of size, and the organization and financing of the enlarged farm units which remain in production. The additional research suggested above can contribute to the store of knowledge necessary to guide the agricultural sector into an era of greater productivity and affluence of individual operators.

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APPENDIX 1

CALCULATION OF CONSTANT DOLLAR VALUES OF FARM CAPITAL, CAPITAL GAINS AND REAL GAINS FROM AGRICULTURAL ASSETS

A. CALCULATION OF A CONSTANT DOLLAR SERIES FOR FARM CAPITAL COMPONENTS 1926-1965

Separation of Land and Building Values

Current values of farm capital by provinces, are found in the Quarterly Bulletin of Agricultural Statistics, Catalogue No. 21-003, issued by the Dominion Bureau of Statistics (DBS). The capital components cited there are real estate (comprised of land and buildings), machinery and livestock.

Current value of real estate was separated into land and building components by employing time series data on building depreciation in agriculture, also published by DBS for the period under study. Since building depreciation was calculated as four percent of value of buildings, it was possible to reconstitute the current capital value of farm buildings by multiplying annual depreciation figures by 25.

Land value was found as a residual by subtracting the calculated value of buildings from the DBS annual values for real estate.

Indexes Employed to Calculate Constant Dollar Series

All constant dollar value series were calculated employing the period 1935-39 as a base.

Land values were deflated with the aid of a price index for the value of land per acre for Canada and each of the provinces. This

was constructed by and obtained from the Canada Department of Agriculture. Reportedly, this is not a final index, insofar as the information employed for its construction was derived from a sample which may have given the values an upward bias. Its use in calculation of real gains, however, is probably not too misleading since, as will be shown below, a ratio of the indices for two adjacent years was employed in the algorithm and the index is probably relatively accurate in indicating relative movements of land values over time.

Building values were deflated by the Index of Building Materials found in "Group Index Numbers of Prices of Equipment and Materials Used by Farmers", published by DBS. This index was calculated separately for eastern and western Canada as well as for Canada as a whole.

Farm machinery values were deflated by the Index of Farm Machinery, also found in the table mentioned above. It too was calculated for the East, the West and Canada.

A constant dollar series for value of livestock was constructed by deflating annual current values by the "animal" component of "Wholesale Price Index Numbers of Canadian Farm Products" calculated regionally as above, by DBS.

Indexes for the East were applied to annual data, by province, for each of the Maritime Provinces, Quebec and Ontario. The western index was used to deflate annual provincial figures for the remaining provinces except Newfoundland which was excluded from the analysis.

Value of total capital assets for each province was calculated by adding the annual deflated values of the four components. Figures in

the constant dollar series for each of the components and total capital were added by province to obtain the weighted aggregate figure for Canada. In other words, the index values for Canada as a whole were not employed in arriving at an aggregate annual constant dollar value for Canadian agricultural capital and its components.

B. CALCULATION OF CAPITAL GAINS AND REAL GAINS FROM AGRICULTURAL ASSETS

The figures relating to capital gains and real gains from agricultural assets were derived from the series of annual current and constant capital values mentioned above. The method employed was developed by D. H. Boyne and is explained fully in Technical Bulletin 294 of Michigan State University's Agriculture Experiment Station, published in 1964 (2). The pertinent portions of the algorithm are explained below. A full explanation of the methodology is given in Chapters IV and V of Boyne's publication. The following portion is abstracted from there.

Decomposition of Value Change into Price and Quantity Components

If the value of an asset in period t, V_t is defined as $P_t Q_t$, where P represents unit price and Q the number of units of the asset, then the difference in the value of the asset between the beginning of the period (V_0) and the end of the period (V_1) can be defined as:

$$(1) \quad V_1 - V_0 = P_1Q_1 - P_0Q_0$$

This can be developed, using the Taylor series expansion of $V = PQ$, to a form from which it is possible to separate the change in current value into a quantity component and a price component.

Quantity Components

Given the two series mentioned previously, current values of farm assets (P_iQ_i) and constant (or deflated) value of farm assets (P_nQ_i), where n stands for the 1935-39 price basis of the constant value series, two quantity components can be estimated.

Quantity Component A (QCA):

$$(2) \quad QCA_i = V_i \left[\frac{P_nQ_{(i+1)}}{P_nQ_i} - 1 \right]$$

Quantity Component B (QCB):

$$(3) \quad QCB_i = V_{(i+1)} \left[1 - \frac{P_nQ_i}{P_nQ_{(i+1)}} \right]$$

The estimated quantity component (EQC) of the total change in current dollar values is equal to the simple average of the quantity component as measured by method A and method B:

$$(4) \quad EQC_i = \frac{QCA_i + QCB_i}{2}$$

Price Component or Capital Gain

The estimated price component (EPC) is equal to the change in current dollar value, minus the estimated quantity component:

$$(5) \quad EPC_i = (V_{i+1} - V_i) - EQC_i$$

The estimated price component of the change in current value of assets EPC is what is generally referred to as the capital gain or loss from ownership of the assets.

Real Gain

Changes in purchasing power (real gains or losses) due to relative price movements can be estimated as the difference between the

estimated price component and the change in value needed to maintain the purchasing power of the investment. The adjustment, in effect, compensates for changes in the value of money and the residual can be attributed to a change in the size of the expected future income stream or to a change in the discount rate employed in calculating the present worth of an investment.

Call the adjustment for changes in the value of money a cost compensation (CC). Then

$$(6) \quad CC_i = V_i \left[\frac{I_i}{I_{(i-1)}} - 1 \right]$$

where I_i is the value of an appropriate cost of living index. In this study three indexes were used:

(1) The composite index of commodities and services used by farmers, inclusive of living costs (1935-39 = 100) East and West;

(2) The index of farm family living costs (1935-39 = 100), East and West;

(3) The consumer price index (1949 = 100), Canada.

Real gains or losses could then be calculated as the difference between EPC_i - estimated capital gain, and CC_i - estimated compensation required for changes in purchasing power. Calling real gains or losses - "$GAIN_{ij}$" where i represents the year and j = 1, 2, 3 the specific cost of living index used, we have

$$(7) \quad GAIN_{ij} = EPC_i - CC_{ij}$$

Total real gains or losses from all four components of farm assets, as presented in this study, were calculated as the sum of the gains or losses from the individual components.

TABLE XXVII

CONSUMER PRICE INDEX FOR CANADA 1949 = 100

Year	Index	Year	Index	Year	Index
1925	75.0	1939	63.2	1953	115.5
1926	75.8	1940	65.7	1954	116.2
1927	74.5	1941	69.6	1955	116.4
1928	74.8	1942	72.9	1956	118.1
1929	75.7	1943	74.2	1957	121.9
1930	75.2	1944	74.6	1958	125.1
1931	67.8	1945	75.0	1959	126.5
1932	61.6	1946	77.5	1960	128.0
1933	58.7	1947	84.8	1961	129.2
1934	59.5	1948	97.0	1962	130.7
1935	59.9	1949	100.0	1963	133.0
1936	61.1	1950	102.9	1964	135.4
1937	63.0	1951	113.7	1965	138.7
1938	63.7	1952	116.5		

SOURCE: D.B.S. publications 62-518 (March 1961) and 62-002. Index values for the years 1925-34 obtained through correspondence with D.B.S.

Year	P.E.I. Index	N.S. Index	N.B. Index	Que. Index	Ont. Index	Man. Index	Sask. Index	Alta. Index	B.C. Index
1926	137.7	112.5	114.8	129.3	137.8	166.7	170.6	162.5	135.6
1927	122.8	115.6	111.1	139.0	144.4	173.3	158.8	175.0	150.8
1928	131.7	106.2	114.8	131.7	137.8	180.0	158.8	175.0	152.5
1929	128.7	112.5	129.6	134.1	133.3	166.7	152.9	175.0	152.5
1930	125.7	93.8	103.7	117.1	115.6	146.7	129.4	150.0	128.8
1931	101.8	90.6	96.3	97.6	102.2	126.7	105.9	125.0	125.4
1932	92.8	87.5	88.9	90.2	84.4	106.7	94.1	106.2	110.2
1933	95.8	81.2	88.9	87.8	84.4	106.7	94.1	100.0	106.8
1934	101.8	84.4	88.9	82.9	91.1	106.7	100.0	100.0	101.7
1935	92.8	96.9	92.6	100.0	93.3	113.3	100.0	100.0	98.3
1936	92.8	109.4	103.7	92.7	97.8	100.0	94.1	100.0	101.7
1937	101.8	100.0	96.3	97.6	102.2	100.0	100.0	100.0	98.3
1938	107.8	90.6	100.0	97.6	100.0	100.0	94.1	93.8	101.7
1939	104.8	103.1	107.4	107.3	102.2	100.0	100.0	100.0	101.7
1940	95.8	87.5	88.9	107.3	102.2	100.0	94.1	100.0	98.3
1941	101.8	96.9	92.6	122.0	100.0	93.3	100.0	100.0	101.7
1942	110.8	103.1	111.1	134.1	106.7	100.0	105.9	106.2	105.1
1943	110.8	109.4	122.2	141.5	124.4	100.0	111.8	112.5	105.1
1944	122.8	128.1	148.1	141.5	128.9	113.3	117.6	118.8	108.5
1945	128.7	128.1	148.1	139.0	126.7	120.0	123.5	125.0	113.6
1946	125.7	131.2	144.4	143.9	131.1	126.7	147.1	131.2	118.6
1947	140.7	143.8	163.0	148.8	142.2	140.0	158.8	156.2	127.1
1948	152.7	150.0	163.0	153.6	151.1	160.0	200.0	193.8	133.9
1949	155.7	153.1	166.7	143.9	157.8	160.0	211.8	206.2	142.4
1950	164.7	162.5	188.9	161.0	166.7	166.7	229.4	218.8	147.4
1951	179.6	171.9	192.6	180.5	200.0	186.7	247.1	231.2	155.9
1952	182.6	168.8	188.9	185.4	204.4	193.3	252.9	231.2	157.6
1953	182.6	168.8	200.0	187.8	217.8	200.0	288.2	268.8	167.8
1954	176.6	168.8	192.6	197.6	224.4	193.3	264.7	256.2	172.9
1955	176.6	175.0	200.0	200.0	237.8	206.7	270.6	262.5	181.4
1956	182.6	184.4	207.4	209.8	246.7	213.3	282.4	268.8	184.7
1957	182.6	184.4	211.1	209.8	255.6	213.3	264.7	268.8	194.9
1958	191.6	200.0	222.2	217.1	273.3	220.0	288.2	287.5	203.4
1959	200.6	218.8	233.3	224.4	295.6	226.7	282.4	293.8	218.6
1960	200.6	215.6	229.6	231.7	293.3	240.0	305.9	312.5	225.4

TABLE XXIX

DEFLATORS EMPLOYED TO OBTAIN CONSTANT VALUE SERIES FOR CAPITAL COMPONENTS OTHER THAN LAND (1935-39 = 1.000)

Buildings		Machinery		Livestock	
East	West	East	West	East	West
1.140	1.140	0.970	0.978	1.314	1.279
1.083	1.083	0.971	0.977	0.279	1.277
1.147	1.147	0.971	0.978	1.365	1.416
1.172	1.172	0.971	0.977	1.424	1.486
1.018	1.018	0.965	0.972	1.317	1.366
0.883	0.883	0.945	0.950	0.933	0.915
0.801	0.801	0.937	0.943	0.712	0.692
0.849	0.849	0.917	0.923	0.701	0.675
0.875	0.875	0.939	0.949	0.878	0.838
0.871	0.871	0.955	0.955	0.945	0.932
0.973	0.973	0.983	0.976	0.944	0.922
1.087	1.087	0.976	0.970	1.058	1.063
0.987	0.987	1.051	1.037	1.047	1.051
1.081	1.081	1.043	1.033	1.006	1.032
1.160	1.160	1.065	1.055	1.058	1.086
1.280	1.280	1.097	1.088	1.230	1.272
1.490	1.479	1.151	1.141	1.418	1.502
1.560	1.540	1.170	1.171	1.573	1.709
1.727	1.733	1.177	1.184	1.611	1. 63
1.739	1.757	1.148	1.152	1.651	1.807
1.750	1.755	1.187	1.188	1.767	1.905
1.850	1.885	1.260	1.264	1.943	2.123
2.159	2.341	1.410	1.418	2.535	2.842
2.244	2.506	1.579	1.584	2.527	2.912
2.312	2.802	1.636	1.656	2.636	3.175
2.670	3.268	1.852	1.874	3.151	3.811
2.756	3.324	1.932	1.962	2.626	3.077
2.783	3.389	1.941	1.977	2.554	2.809
2.789	3.366	1.944	1.992	2.471	2.747
2.811	3.380	1.960	1.999	2.356	2.643
2.910	3.435	2.082	2.099	2.375	2.659
2.985	3.488	2.246	2.235	2.476	2.790
2.983	2.461	2.389	2.359	2.609	3.021
3.003	3.523	2.520	2.470	2.573	3.008
2.977	3.592	2.575	2.528	2.515	2.896
2.965	3.536	2.655	2.598	2.572	2.961
2.986	3.555	2.726	2.673	2.685	3.217
3.056	3.644	2.753	2.720	2.596	3.075
3.251	3.924	2.815	2.789	2.537	2.949
3.394	4.052	2.866	2.842	2.734	3.217

CURRENT VALUE OF LAND IN AGRICULTURE 1926-65

-THOUSANDS OF DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	YAK.	NWT.	CANADA
1926	25165.	48178.	59745.	553296.	809754.	356300.	926840.	551411.	116581.	133088.	1834551.	3442270.
1927	26015.	44676.	61720.	524021.	771004.	357475.	910190.	536811.	113431.	135013.	1804476.	3347946.
1928	24265.	50678.	60645.	531546.	780479.	353000.	841640.	528561.	110950.	135788.	1773241.	3321070.
1929	23615.	47803.	55320.	516346.	781679.	350575.	894815.	519711.	106606.	126938.	1766101.	3298670.
1930	25401.	39248.	38889.	475058.	673649.	257485.	906989.	650332.	109850.	103538.	1814966.	3176901.
1931	23895.	40014.	39961.	438581.	649147.	224935.	817044.	567049.	107656.	103870.	1609028.	2908282.
1932	22066.	39709.	37552.	414046.	543397.	196115.	692244.	478452.	94442.	99329.	1366811.	2512562.
1933	23071.	37800.	38202.	410585.	550547.	191291.	697322.	447525.	91382.	99078.	1336138.	2497115.
1934	24641.	40189.	38852.	394454.	601930.	197927.	701809.	443428.	86870.	103882.	1343164.	2535346.
1935	19826.	37796.	34874.	367730.	545940.	191962.	751603.	439357.	83042.	92496.	1382922.	2472180.
1936	19347.	41351.	38015.	323971.	559167.	175060.	667574.	434601.	85472.	98713.	1277225.	2344552.
1937	20669.	36508.	34327.	324095.	571776.	184817.	621182.	428316.	82256.	91694.	1274315.	2339945.
1938	21293.	32629.	34642.	307846.	546255.	172740.	577800.	395495.	84670.	87944.	1146041.	2177756.
1939	20150.	35195.	36075.	321566.	545202.	182413.	537150.	415921.	83417.	91626.	1135404.	2177635.
1940	17981.	29840.	28974.	308077.	531701.	170452.	499080.	409661.	81005.	75715.	1079193.	2072711.
1941	18276.	30520.	28697.	328533.	505273.	179238.	557394.	412226.	82889.	77403.	1148858.	2143046.
1942	19149.	31453.	33196.	363527.	543111.	187549.	590497.	434547.	92445.	83709.	1212593.	2275474.
1943	18497.	32318.	35371.	385359.	594033.	195902.	584625.	456256.	98492.	86188.	1236783.	2401824.
1944	19902.	36867.	41777.	387124.	600944.	203840.	656339.	477551.	107283.	98546.	1337730.	2531627.
1945	20310.	35994.	40774.	381919.	578563.	211954.	689082.	498959.	117518.	97078.	1399995.	2570078.
1946	19244.	35627.	38651.	393295.	579509.	245627.	717940.	516779.	124733.	93522.	1489346.	2671405.
1947	20436.	37637.	42569.	400244.	619786.	259761.	771581.	590278.	137337.	100582.	1621628.	2879569.
1948	21058.	37089.	41525.	465478.	650272.	321694.	860747.	708192.	149071.	100472.	1896633.	3359926.
1949	20445.	38274.	41491.	378107.	668821.	334377.	842354.	733154.	160474.	100211.	1900885.	3328298.
1950	21750.	41201.	51160.	426903.	709063.	363403.	905933.	765184.	173255.	114111.	2034520.	3657732.
1951	23969.	44886.	51992.	499473.	898964.	391373.	971155.	798089.	190593.	120447.	2162617.	3972954.
1952	24294.	43975.	51650.	498443.	918654.	406420.	1033925.	792764.	194992.	119919.	2238069.	3966017.
1953	23619.	44725.	50754.	493255.	994326.	462775.	1088449.	1036497.	214352.	119098.	2587721.	4611762.
1954	22318.	44025.	50525.	496738.	1025697.	473592.	1022900.	958786.	222809.	116864.	2405238.	4286939.
1955	21710.	43348.	50429.	492696.	1096869.	432624.	1138645.	992217.	237745.	115496.	2563586.	4595281.
1956	21669.	42296.	49357.	497963.	1139873.	452643.	1193015.	1024723.	242103.	113322.	2670381.	4668382.
1957	20969.	41596.	48671.	486978.	1182330.	439621.	1186240.	1019023.	239888.	111236.	2644884.	4685816.
1958	21133.	40319.	47388.	487777.	1270616.	461315.	1237014.	1127040.	273698.	108840.	2826162.	4973130.
1959	21951.	39550.	46455.	498469.	1409842.	449768.	1293909.	1165245.	304190.	107956.	2908922.	5229265.
1960	21951.	39550.	46250.	509254.	1396950.	495393.	1414098.	1280412.	317756.	107791.	3189903.	5521630.
1961	21951.	39188.	45540.	519832.	1516553.	518462.	1472348.	1318617.	317756.	106679.	3309427.	5776247.
1962	22947.	38117.	43469.	514528.	1581088.	528063.	1591727.	1396196.	324837.	104513.	3515986.	6140952.
1963	23261.	38117.	42779.	530440.	1613368.	566493.	1870261.	1525469.	329541.	104157.	3962223.	6539729.
1964	23928.	39710.	44850.	551656.	1753181.	633701.	2188621.	1706462.	341301.	108488.	4528784.	7297410.
1965	24570.	41328.	46921.	588783.	1882250.	720111.	2626335.	1965009.	376607.	112819.	5311455.	8271216.

CURRENT VALUE OF BUILDINGS IN AGRICULTURE 1926-65

-THOUSANDS OF DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1926	20600.	52150.	46525.	278900.	489700.	71950.	166600.	93575.	29475.	119275.	332125.	1249475.
1927	19150.	53650.	44550.	308175.	528450.	70775.	183250.	108175.	34625.	117350.	362200.	1350800.
1928	21500.	49450.	45625.	300650.	518975.	75250.	201800.	116425.	37100.	116575.	393475.	1346775.
1929	21950.	52525.	50950.	315850.	517775.	77675.	198625.	125275.	39450.	125425.	401575.	1486675.
1930	22450.	43850.	40350.	284750.	463225.	71100.	186425.	115925.	35500.	106650.	373450.	1263575.
1931	19025.	42500.	37100.	245550.	423700.	63725.	172100.	104375.	36925.	98625.	340200.	1148000.
1932	17075.	40000.	33575.	218775.	342775.	54675.	143575.	88425.	32500.	90650.	286675.	971375.
1933	17325.	36250.	32925.	205150.	335625.	53425.	142275.	82875.	31625.	86500.	278575.	937475.
1934	16100.	36675.	32275.	186800.	354250.	55450.	141050.	82675.	30225.	87050.	279175.	937500.
1935	16200.	41075.	32950.	217275.	355050.	54150.	148675.	82450.	29300.	90225.	285275.	977125.
1936	15900.	45150.	36125.	194275.	363450.	49725.	130225.	82400.	30450.	97175.	262350.	947730.
1937	17125.	40250.	32825.	197375.	371525.	52150.	125175.	83450.	29525.	90200.	260775.	949400.
1938	17825.	35500.	33825.	190550.	354825.	48350.	120150.	79125.	30650.	86650.	247625.	913300.
1939	16975.	39350.	35000.	202400.	354100.	50725.	115150.	85375.	30775.	91325.	251250.	929850.
1940	15250.	32500.	28275.	195500.	345425.	47125.	110175.	86400.	29825.	76025.	243700.	890475.
1941	16100.	35250.	29300.	214825.	330875.	50250.	100200.	78600.	31400.	80650.	229050.	886800.
1942	16950.	36400.	34025.	238650.	344525.	55650.	111725.	88925.	35700.	87375.	256300.	962550.
1943	16475.	37000.	36425.	254000.	393725.	61025.	115850.	99750.	38775.	90500.	276625.	1055625.
1944	17775.	43000.	43075.	256200.	401575.	66550.	135625.	110800.	43050.	103850.	313175.	1117850.
1945	18200.	42050.	42225.	253900.	389275.	72125.	148400.	122200.	48025.	102475.	342725.	1136400.
1946	17475.	42650.	40725.	268225.	406150.	92875.	164200.	137275.	56025.	100850.	394350.	1225630.
1947	19775.	46475.	45525.	286975.	434400.	98250.	179475.	159700.	63975.	111775.	437425.	1336550.
1948	21725.	48325.	49175.	307400.	455750.	121650.	203550.	195125.	71500.	115225.	520325.	1470230.
1949	22375.	46375.	45975.	297250.	473275.	128625.	202500.	205650.	80300.	116725.	536775.	1504325.
1950	22800.	49350.	48750.	325850.	485175.	132500.	207725.	211525.	83175.	118900.	551750.	1564850.
1951	23875.	50000.	46725.	347500.	520400.	135500.	211750.	217200.	87475.	120600.	564450.	1640425.
1952	24225.	50275.	46850.	362450.	545675.	138575.	224425.	222525.	88450.	121350.	585525.	1703450.
1953	24900.	49525.	46750.	374850.	606050.	162225.	243325.	279125.	100475.	121175.	684675.	1887225.
1954	24850.	50225.	46975.	397375.	641550.	152625.	235450.	256725.	107925.	122050.	644800.	1913700.
1955	25450.	50850.	47075.	410125.	706425.	159575.	268575.	273700.	119000.	123375.	701850.	2060775.
1956	26850.	51025.	46900.	432925.	753350.	171600.	289650.	291600.	125175.	124775.	752850.	2189675.
1957	27550.	51725.	46975.	443850.	801975.	168600.	296425.	297300.	134775.	126250.	762325.	2273175.
1958	29375.	51550.	46400.	464350.	888700.	178950.	318275.	339100.	150975.	127325.	836325.	2467675.
1959	30550.	50575.	45475.	474400.	981450.	174475.	337625.	350600.	167775.	126600.	862700.	2612925.
1960	30550.	50575.	45250.	484800.	972450.	192175.	369000.	385250.	175275.	126375.	946425.	2709325.
1961	30550.	50075.	44575.	494850.	1055750.	201150.	384175.	396750.	175275.	125200.	982075.	2833150.
1962	31925.	48700.	42550.	489800.	1100675.	204875.	415325.	420075.	179150.	123175.	1040275.	2933075.
1963	32375.	48700.	41875.	504950.	1123125.	219750.	488025.	458975.	181750.	122950.	1166750.	3099525.
1964	33275.	50775.	43900.	525150.	1220475.	245825.	571075.	513425.	188250.	127950.	1330325.	3392150.
1965	34200.	52825.	45925.	560500.	1310325.	279350.	685300.	591225.	207725.	132950.	1555875.	3767375.

CURRENT VALUE OF MACHINERY IN AGRICULTURE 1926-65

-THOUSANDS OF DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	YAR.	NB.	CANADA
1926	7017.	9691.	12572.	95969.	160257.	57964.	169530.	87613.	10906.	29280.	315307.	611719.
1927	7211.	9831.	12641.	95503.	160358.	67044.	187767.	107532.	11385.	29683.	362343.	659272.
1928	7647.	10284.	13132.	97852.	165114.	76035.	210131.	128450.	12235.	31063.	414616.	726880.
1929	8265.	10966.	13907.	102217.	171906.	81734.	230525.	146076.	13338.	33138.	458835.	778994.
1930	8381.	11007.	13909.	101709.	166717.	72808.	218581.	139144.	13502.	33297.	430533.	748768.
1931	8116.	10554.	13252.	97270.	151928.	54847.	185510.	116301.	12886.	31922.	356658.	651644.
1932	7799.	10401.	12836.	95266.	148763.	50245.	169589.	108247.	12966.	31036.	328081.	614112.
1933	7408.	10154.	12302.	92247.	143929.	46313.	157490.	102206.	12830.	29864.	306009.	584879.
1934	7033.	9928.	11795.	89196.	139537.	42684.	145769.	96207.	12743.	28756.	284660.	556692.
1935	6724.	9783.	11365.	86886.	137118.	40545.	136170.	92082.	12873.	27872.	268797.	532546.
1936	6474.	9716.	11059.	85297.	137514.	40173.	131095.	89925.	13176.	27249.	261193.	524429.
1937	6277.	9881.	10989.	84525.	138883.	42045.	129581.	91278.	13697.	27067.	262704.	526876.
1938	6197.	10255.	10974.	85550.	142582.	48223.	128906.	96785.	14309.	27426.	273914.	543781.
1939	5998.	10378.	10805.	84937.	144023.	53979.	129992.	92814.	14467.	27181.	276785.	547333.
1940	5851.	10582.	10726.	84413.	145253.	55994.	132166.	108767.	14597.	27159.	296927.	568349.
1941	6801.	10961.	10825.	85203.	150359.	58887.	142754.	166128.	15128.	28587.	367769.	647046.
1942	6416.	11751.	11746.	93786.	169443.	65670.	158265.	125586.	17829.	29913.	349921.	666492.
1943	7068.	12481.	12614.	100801.	187294.	73152.	173281.	135035.	20611.	32103.	381468.	722277.
1944	7479.	12968.	13242.	106189.	196931.	76742.	182278.	139429.	22829.	33685.	392449.	758083.
1945	8172.	13857.	14280.	114031.	213717.	85166.	201341.	150406.	25662.	36309.	436913.	826632.
1946	9053.	15049.	15631.	123153.	232517.	94394.	223463.	163310.	29921.	39733.	481167.	905431.
1947	10240.	16726.	17501.	135505.	257402.	108294.	257769.	189633.	33493.	44477.	556696.	1026573.
1948	11537.	18502.	19555.	150561.	290879.	128382.	308000.	228332.	39119.	49674.	664714.	1124947.
1949	13130.	20873.	22089.	169413.	335569.	157043.	372463.	278704.	45262.	56092.	808210.	1419544.
1950	14653.	23005.	24475.	189607.	389352.	201041.	449591.	335705.	53646.	62133.	986347.	1681076.
1951	16261.	25224.	26971.	211937.	445278.	231801.	525645.	390003.	59760.	68456.	1147449.	1931840.
1952	17841.	27140.	28959.	228588.	486270.	248006.	558823.	418868.	62292.	73048.	1225627.	2076787.
1953	20123.	29575.	31448.	245263.	519570.	267411.	617581.	459663.	66982.	81146.	1344655.	2257636.
1954	21400.	30939.	32664.	251303.	531526.	274057.	659286.	482197.	69176.	85003.	1415540.	2352548.
1955	21215.	30020.	31668.	247411.	520991.	261103.	635283.	466358.	69577.	82903.	1362744.	2283626.
1956	22022.	30692.	32099.	254403.	526358.	251983.	615217.	458370.	72142.	84813.	1325570.	2267236.
1957	24010.	32369.	33732.	272099.	556333.	259489.	636509.	479512.	77356.	90111.	1375510.	2371439.
1958	25115.	32138.	33926.	287524.	574683.	261516.	648114.	497812.	80363.	91179.	1407442.	2441191.
1959	26108.	32115.	33943.	300076.	589969.	264691.	660441.	519245.	83066.	92166.	1444377.	2506654.
1960	26774.	31541.	33321.	306381.	596787.	271253.	679413.	543556.	86019.	91616.	1494222.	2579925.
1961	26650.	30252.	31682.	301257.	579282.	272019.	686826.	550876.	86480.	88790.	1509721.	2565538.
1962	28099.	31652.	32860.	322167.	598213.	280239.	699973.	573013.	89795.	92811.	1553225.	2656211.
1963	29112.	32777.	34007.	345749.	623084.	295666.	729758.	599170.	92427.	95896.	1624614.	2781770.
1964	30116.	33926.	35215.	366111.	654512.	320287.	781173.	630961.	95858.	99267.	1752421.	2948169.
1965	31505.	35498.	36870.	382605.	692481.	348645.	843110.	669547.	99912.	103873.	1861300.	3160171.

CURRENT VALUE OF LIVESTOCK IN AGRICULTURE 1926-65

-THOUSANDS OF DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1926	13049.	20718.	18797.	141304.	258046.	62406.	142921.	104399.	23986.	52564.	309726.	786636.
1927	13700.	21172.	18652.	153164.	285666.	69954.	147543.	125182.	28071.	53524.	342679.	868104.
1928	15366.	23026.	20719.	173907.	306606.	75855.	154060.	127681.	35259.	59711.	357597.	933090.
1929	15347.	24173.	21255.	194568.	306778.	72953.	142986.	131520.	37918.	60775.	347459.	947498.
1930	12123.	21425.	18695.	149065.	244566.	59187.	120301.	100898.	31963.	52244.	280386.	758224.
1931	7355.	14086.	14616.	97922.	169329.	40330.	81727.	71917.	19432.	36057.	193974.	516714.
1932	5758.	11959.	12701.	81339.	130030.	33028.	60483.	56821.	15767.	30418.	150332.	419986.
1933	6225.	11975.	12706.	77540.	144201.	35705.	74340.	65035.	16365.	30986.	175080.	444032.
1934	6219.	10913.	12565.	82525.	145706.	34931.	77368.	70520.	16911.	29693.	182819.	457654.
1935	7322.	11677.	13609.	95715.	178289.	41247.	94110.	81381.	17157.	32608.	216738.	540507.
1936	7627.	12758.	14511.	101560.	193656.	45552.	97037.	82013.	18918.	34896.	224602.	573632.
1937	7966.	14397.	15153.	117408.	198942.	51821.	91905.	86043.	20097.	37456.	229769.	603672.
1938	7686.	13719.	14656.	116067.	197490.	50931.	79878.	86991.	20119.	36061.	217400.	587077.
1939	7767.	13962.	15513.	122011.	217858.	55885.	93624.	97568.	20297.	37242.	247077.	644485.
1940	7804.	14128.	15364.	132429.	220868.	58958.	101877.	108761.	22833.	36796.	260596.	687522.
1941	5981.	11899.	12359.	112920.	203635.	51542.	95926.	105103.	20939.	30239.	252571.	620334.
1942	8579.	14892.	14298.	137398.	242136.	64840.	119850.	124092.	25508.	37569.	308722.	751383.
1943	11984.	21255.	23843.	216491.	335241.	92738.	175780.	185719.	34915.	57082.	454237.	1097966.
1944	12096.	21616.	23422.	212548.	322299.	89779.	176514.	186855.	36838.	57134.	453148.	1081967.
1945	12664.	21431.	22293.	204570.	333099.	84122.	155921.	170612.	37590.	56388.	410655.	1042202.
1946	13096.	23770.	23196.	223388.	362178.	80755.	145543.	164505.	38859.	60062.	390803.	1075330.
1947	12969.	24717.	23968.	233753.	374226.	90590.	161578.	186248.	40817.	61644.	438416.	1149856.
1948	13606.	24796.	24936.	245199.	413594.	98074.	172000.	208369.	44407.	63338.	478442.	1244931.
1949	15708.	24338.	25522.	263291.	449679.	113761.	195279.	236341.	46873.	65568.	545381.	1377742.
1950	16660.	28278.	26569.	269538.	485067.	115349.	209659.	263799.	52721.	71447.	589807.	1467546.
1951	23095.	32995.	32120.	333946.	682197.	156612.	283891.	384461.	72216.	88168.	824864.	2056491.
1952	19267.	33649.	29392.	328942.	561148.	138326.	264908.	351602.	63420.	82528.	754836.	1790874.
1953	16343.	28425.	25785.	284581.	490068.	120111.	224037.	307001.	59152.	71553.	651149.	1556603.
1954	15540.	25252.	23106.	258127.	454733.	105563.	198914.	286962.	55879.	63898.	591439.	1424075.
1955	15614.	25958.	23894.	250520.	459295.	113063.	214068.	303138.	57257.	65466.	630269.	1462807.
1956	14638.	23831.	23230.	257156.	430056.	109831.	216437.	292475.	55065.	61699.	618743.	1422719.
1957	14377.	22342.	21787.	256423.	465308.	111543.	228403.	336500.	55789.	58506.	674446.	1512472.
1958	16149.	23582.	24834.	303753.	575884.	144353.	290664.	410620.	70622.	64565.	845637.	1866461.
1959	17165.	25703.	25001.	314288.	593559.	157742.	305442.	438137.	78390.	68889.	901321.	1956443.
1960	16754.	26318.	23675.	310684.	578124.	150536.	286305.	410667.	74927.	66747.	847528.	1878010.
1961	16957.	26642.	23617.	309871.	593722.	163723.	321737.	452920.	81045.	67216.	938380.	1995234.
1962	16969.	26962.	22551.	327668.	630884.	166889.	321528.	454413.	85895.	66502.	942830.	2033770.
1963	17345.	26628.	22297.	335233.	622586.	178604.	341242.	484777.	91021.	66470.	1004623.	2119933.
1964	17740.	26431.	22319.	322469.	629458.	188523.	358472.	507831.	93039.	66490.	1054831.	2166267.
1965	18486.	26083.	21698.	326301.	629857.	175568.	334985.	477247.	91465.	66217.	988398.	2102230.

CURRENT VALUE OF TOTAL ASSETS IN AGRICULTURE 1926-65

-THOUSANDS OF DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1926	65831.	130737.	137639.	1069469.	1717757.	548620.	1405891.	837196.	182948.	334207.	2791709.	8096000.
1927	66676.	131331.	137563.	1080863.	1745478.	565248.	1428750.	877700.	187512.	335570.	2871698.	8221121.
1928	68778.	134238.	140121.	1103955.	1771174.	580141.	1457631.	901117.	195550.	343137.	2938889.	8352705.
1929	69277.	135467.	141432.	1128981.	1778138.	582937.	1466951.	922582.	199312.	346276.	2972470.	8426177.
1930	68355.	135531.	141043.	1010582.	1548157.	460580.	1432296.	1006299.	190815.	295720.	2899175.	8044458.
1931	58391.	107154.	104929.	879323.	1394104.	383837.	1256381.	859642.	176899.	270474.	2498860.	7220680.
1932	52700.	102069.	96664.	809426.	1164965.	334063.	1073691.	731945.	155675.	251433.	2139899.	6521330.
1933	54029.	96179.	96135.	785522.	1174302.	326734.	1071427.	697641.	152202.	246343.	2095802.	6454171.
1934	56189.	97705.	95467.	752975.	1241423.	330992.	1065996.	692830.	146757.	249581.	2089818.	6490354.
1935	56072.	100331.	92798.	767606.	1216397.	327904.	1130558.	695270.	142372.	243201.	2163732.	6523378.
1936	49348.	108975.	99710.	705103.	1253787.	310510.	1025931.	688939.	140016.	258033.	2025380.	6390319.
1937	51977.	101036.	95214.	723403.	1281126.	330833.	967643.	689087.	145575.	246227.	1987543.	6298884.
1938	53001.	91503.	93577.	699953.	1241152.	319844.	906740.	650396.	149748.	238081.	1884980.	6128014.
1939	50696.	90885.	97393.	730854.	1261183.	343002.	875916.	691678.	148956.	247174.	1910506.	6298763.
1940	48306.	86050.	83339.	717419.	1243307.	332529.	843298.	713589.	148260.	215605.	1889416.	6214087.
1941	47158.	88636.	81181.	741481.	1190142.	339917.	896274.	762057.	150356.	216969.	1998248.	6297136.
1942	51094.	94296.	93265.	833361.	1279215.	373709.	980337.	773150.	171482.	238655.	2127196.	6669009.
1943	53966.	102654.	108253.	956651.	1510293.	422817.	1049536.	876760.	192793.	265873.	2349113.	7274723.
1944	57248.	114451.	121516.	962061.	1521749.	436911.	1150956.	914635.	210000.	293215.	2502502.	7489527.
1945	59346.	113332.	119572.	954420.	1514654.	453367.	1194744.	942177.	228795.	292250.	2590288.	7880407.
1946	58608.	117096.	118203.	1008061.	1580354.	513651.	1251146.	981869.	246578.	294167.	2746666.	8377826.
1947	63410.	125965.	129563.	1056477.	1685814.	556895.	1370403.	1125859.	275622.	318479.	3053157.	9389848.
1948	67926.	129592.	131191.	1108638.	1810495.	669800.	1544297.	1340018.	303097.	328709.	3554115.	11105054.
1949	71659.	131860.	135077.	1103061.	1927344.	733806.	1612596.	1453049.	333909.	338596.	3800291.	11501151.
1950	75863.	141834.	140894.	1211698.	2068597.	812293.	1772908.	1576213.	362797.	366591.	4161414.	12171097.
1951	87198.	152665.	157808.	1397856.	2546839.	917286.	1992441.	1789753.	409044.	397671.	4699480.	14450000.
1952	85647.	155239.	156851.	1418423.	2511747.	931227.	2082081.	1785759.	409154.	397737.	4799067.	14536120.
1953	84965.	152250.	155757.	1397969.	2610014.	1012522.	2173092.	2082286.	440961.	392972.	5268200.	16110116.
1954	84108.	150441.	153270.	1405543.	2653506.	955797.	2116550.	1984670.	455789.	387819.	5057017.	15993474.
1955	83997.	150176.	153066.	1400752.	2783580.	906365.	2256571.	2035413.	483579.	387239.	5258349.	16318496.
1956	85179.	147844.	151586.	1442387.	2849637.	986057.	2314319.	2067168.	494485.	384609.	5367544.	16538662.
1957	86906.	148022.	151165.	1499250.	3005946.	979253.	2347577.	2132335.	521808.	386103.	5459165.	16843378.
1958	91772.	147589.	152548.	1543404.	3315883.	1046134.	2494867.	2374572.	575658.	391909.	5915573.	17742427.
1959	95794.	148542.	150874.	1587119.	3574816.	1046676.	2597417.	2473227.	633421.	395611.	6117320.	18308287.
1960	98029.	147964.	148496.	1611119.	3544297.	1109357.	2748816.	2619905.	693977.	392489.	6479078.	19279960.
1961	96814.	146157.	145414.	1625810.	3745307.	1155354.	2865086.	2719163.	660564.	387885.	6739603.	19159169.
1962	99920.	145651.	141430.	1654163.	3910866.	1180066.	3028553.	2843697.	679677.	387001.	7052316.	19484017.
1963	102093.	146422.	140958.	1716372.	3982163.	1260533.	3429286.	3068391.	694739.	389473.	7758210.	14940957.
1964	105059.	150852.	146284.	1765386.	4257626.	1398341.	3899341.	3358679.	718448.	402195.	8646361.	15790016.
1965	108761.	155684.	151414.	1858189.	4514913.	1523670.	4489730.	3703628.	775709.	415859.	9717028.	17281696.

INDEX OF CURRENT VALUE OF AGGREGATE FARM CAPITAL—(1940=100)

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1926	142.2	151.9	165.2	149.1	138.2	165.0	166.7	117.3	123.4	154.9	147.8	144.7
1927	144.0	152.6	165.1	150.7	140.4	170.0	169.4	123.0	126.5	156.6	152.0	147.6
1928	146.5	156.0	168.1	153.9	142.5	174.5	172.8	126.3	131.9	159.1	155.5	150.7
1929	149.8	157.4	169.7	157.4	143.0	175.3	174.0	129.3	134.4	160.5	157.3	152.5
1930	147.6	134.5	134.2	140.9	124.5	138.5	169.8	141.0	128.7	137.1	153.4	141.1
1931	126.1	124.5	125.9	122.6	112.1	115.4	149.0	120.5	119.3	125.4	132.3	123.9
1932	113.8	118.6	116.0	112.8	93.7	100.5	127.3	102.6	105.0	116.6	113.3	107.3
1933	116.7	111.8	115.4	109.5	94.4	98.3	127.1	97.8	102.7	114.2	110.9	105.7
1934	121.3	113.5	114.6	105.0	99.8	99.5	126.4	97.1	99.0	115.6	110.6	106.3
1935	108.1	116.6	111.3	107.0	97.8	98.6	134.1	97.4	96.0	112.8	114.0	107.3
1936	106.6	126.6	119.6	98.3	100.8	93.4	121.7	96.5	99.8	119.6	107.2	104.2
1937	112.2	117.4	111.8	100.8	103.0	99.5	114.7	96.6	98.2	114.2	105.2	104.0
1938	114.5	106.3	112.3	97.6	99.8	96.2	107.5	92.3	101.0	110.4	99.8	100.8
1939	109.9	114.9	116.9	101.9	101.4	103.1	103.9	96.9	100.5	114.6	101.1	102.0
1940	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1941	101.8	103.0	97.4	103.4	95.7	102.2	106.3	106.8	101.4	100.6	105.8	102.0
1942	110.3	109.6	111.9	116.2	102.9	112.4	116.3	108.3	115.7	110.6	112.6	110.3
1943	116.5	120.5	129.9	133.3	121.5	127.2	124.5	122.9	130.0	123.3	124.3	125.7
1944	123.6	132.0	145.8	134.1	122.4	131.4	136.5	128.2	141.6	135.9	132.4	132.3
1945	128.2	131.7	143.5	133.0	121.8	136.3	141.7	132.0	154.3	135.5	137.1	132.4
1946	127.1	136.1	141.8	140.5	127.1	154.5	148.4	137.6	167.7	136.4	149.4	139.5
1947	136.9	145.9	155.4	147.3	135.6	167.5	162.5	157.8	185.9	147.7	161.6	151.6
1948	146.7	150.8	157.4	154.5	145.6	201.4	183.1	187.8	204.4	152.4	168.1	168.6
1949	154.8	153.2	162.1	153.8	155.0	220.7	191.2	203.7	225.2	157.0	201.1	176.0
1950	163.8	164.8	178.7	168.9	166.4	244.3	210.2	220.9	244.7	170.0	220.2	193.9
1951	188.3	177.4	189.4	194.8	204.8	275.9	236.3	250.8	275.9	184.4	248.7	224.3
1952	185.0	180.4	188.2	197.7	202.0	280.0	246.9	250.3	276.0	184.4	254.0	229.3
1953	183.5	176.9	186.9	194.9	209.9	304.5	257.7	291.8	297.4	182.2	276.8	239.9
1954	181.6	174.8	183.9	195.9	213.4	287.4	251.0	278.1	307.4	179.8	267.6	236.3
1955	181.4	174.5	183.7	195.2	223.9	290.6	267.6	285.2	326.2	179.5	278.3	244.7
1956	183.9	171.8	181.9	201.1	229.2	296.5	274.4	289.7	333.5	178.3	284.1	251.1
1957	187.7	172.0	181.4	203.4	241.8	294.5	278.4	298.8	358.7	179.0	286.9	257.3
1958	190.2	171.5	183.0	215.1	266.7	314.6	295.8	332.8	388.3	181.7	313.1	279.6
1959	206.9	173.1	181.0	221.2	287.5	314.8	308.0	346.6	427.2	183.4	323.8	292.1
1960	207.4	172.0	178.2	224.6	285.1	333.6	326.0	367.1	441.1	182.0	342.9	309.9
1961	208.0	169.9	174.5	226.6	301.2	347.4	339.7	381.1	445.5	179.8	356.7	312.3
1962	215.8	169.3	169.7	230.6	314.6	354.9	359.1	398.5	458.4	179.4	373.3	324.7
1963	220.5	170.2	169.1	239.2	320.3	379.1	406.7	430.0	468.6	180.6	410.6	345.1
1964	226.9	175.3	175.5	246.1	342.4	417.5	462.4	470.7	484.6	186.5	457.6	374.7
1965	234.9	180.9	181.7	259.0	363.1	458.2	532.4	519.0	523.2	192.8	514.3	413.1

INDEX OF CURRENT VALUE OF AGGREGATE FARM CAPITAL-(CANADA=100)

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR
1926	1.1	2.1	2.3	17.5	28.2	9.0	23.1	13.7	3.0	5.5	45.8
1927	1.1	2.1	2.2	17.4	28.1	9.1	23.0	14.1	3.0	5.4	46.2
1928	1.1	2.1	2.2	17.4	27.9	9.1	22.9	14.2	3.1	5.4	46.3
1929	1.1	2.1	2.2	17.6	27.7	9.1	22.8	14.4	3.1	5.4	46.3
1930	1.1	1.9	1.9	17.0	26.0	7.7	24.1	16.9	3.2	5.0	48.8
1931	1.1	2.1	2.0	16.8	26.7	7.4	24.1	16.5	3.4	5.2	47.9
1932	1.2	2.3	2.1	17.9	25.8	7.4	23.8	16.2	3.4	5.6	47.3
1933	1.2	2.2	2.2	17.6	26.4	7.3	24.1	15.7	3.4	5.5	47.1
1934	1.3	2.2	2.1	16.8	27.7	7.4	23.8	15.5	3.3	5.6	46.6
1935	1.1	2.2	2.1	17.0	26.9	7.2	25.0	15.4	3.1	5.4	47.6
1936	1.1	2.5	2.3	16.1	28.6	7.1	23.4	15.7	3.4	5.9	46.1
1937	1.2	2.3	2.1	16.5	29.2	7.5	22.1	15.7	3.3	5.6	45.3
1938	1.3	2.2	2.2	16.6	29.5	7.6	21.5	15.6	3.6	5.6	44.7
1939	1.2	2.3	2.3	17.0	29.3	8.0	20.4	16.1	3.5	5.7	44.4
1940	1.1	2.0	2.0	17.0	29.5	7.9	20.0	16.9	3.5	5.1	44.8
1941	1.1	2.1	1.9	17.3	27.7	7.9	20.9	17.7	3.5	5.0	46.5
1942	1.1	2.0	2.0	17.9	27.5	8.0	21.1	16.6	3.7	5.1	45.7
1943	1.0	2.0	2.1	18.1	28.6	8.0	19.9	16.6	3.7	5.0	44.5
1944	1.0	2.1	2.2	17.5	27.7	8.0	21.0	16.7	3.8	5.3	45.6
1945	1.1	2.0	2.1	17.1	27.1	8.1	21.4	16.9	4.1	5.2	46.4
1946	1.0	2.0	2.0	17.2	26.9	8.7	21.3	16.7	4.2	5.0	46.7
1947	1.0	2.0	2.0	16.5	26.4	8.7	21.4	17.6	4.3	5.0	47.8
1948	1.0	1.8	1.8	15.6	25.5	9.4	21.7	18.9	4.3	4.6	50.0
1949	1.0	1.8	1.8	14.7	25.7	9.8	21.5	19.4	4.5	4.5	50.6
1950	0.9	1.7	1.8	14.8	25.3	9.9	21.7	19.3	4.4	4.5	50.9
1951	0.9	1.6	1.7	14.8	26.9	9.7	21.1	18.9	4.3	4.8	49.7
1952	0.9	1.6	1.6	14.9	26.3	9.8	21.8	18.7	4.3	4.2	50.3
1953	0.8	1.5	1.5	13.8	25.8	10.0	21.5	20.6	4.4	3.9	52.1
1954	0.8	1.5	1.5	14.1	26.6	9.6	21.3	19.9	4.6	3.9	50.8
1955	0.8	1.5	1.5	13.6	27.0	9.4	21.9	19.7	4.7	3.8	51.0
1956	0.8	1.4	1.4	13.7	27.0	9.4	22.0	19.6	4.7	3.6	50.9
1957	0.8	1.4	1.4	13.5	27.7	9.0	21.7	19.7	4.9	3.6	50.4
1958	0.8	1.3	1.3	13.1	28.2	8.9	21.2	20.2	4.9	3.3	51.4
1959	0.8	1.2	1.2	12.9	29.0	8.5	21.1	20.1	5.1	3.2	49.7
1960	0.8	1.2	1.2	12.7	28.0	8.7	21.7	20.7	5.2	3.1	51.1
1961	0.7	1.1	1.1	12.4	28.5	8.8	21.8	20.7	5.0	2.9	51.2
1962	0.7	1.1	1.0	12.1	28.6	8.6	22.1	20.8	5.0	2.8	51.5
1963	0.7	1.0	1.0	11.8	27.4	8.7	23.6	21.1	4.8	2.7	53.4
1964	0.7	1.0	0.9	11.2	27.0	8.8	24.7	21.3	4.6	2.5	54.8
1965	0.6	0.9	0.9	10.8	26.1	8.8	26.0	21.4	4.5	2.4	56.2

DEFLATED VALUE OF LAND IN AGRICULTURE 1926-65

-THOUSANDS OF DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAC.	PR.	CANADA
1926	18275.	42825.	52043.	427917.	587630.	208851.	555993.	339330.	87449.	113143.	1104173.	2328310.
1927	21673.	40379.	55554.	376994.	533936.	225110.	525211.	306749.	75219.	117606.	1057070.	2160825.
1928	18424.	47908.	52827.	403604.	566386.	222292.	495356.	302035.	72758.	119159.	1019683.	2181588.
1929	18504.	42492.	42685.	385046.	586406.	229284.	536782.	296978.	71217.	103681.	1063043.	2209392.
1930	20208.	41842.	37501.	405686.	582742.	198984.	618261.	433555.	85287.	99551.	1250799.	2424064.
1931	23472.	44166.	41496.	449366.	635174.	212403.	644865.	453639.	85850.	109134.	1310907.	2599430.
1932	23780.	45382.	42241.	459031.	643835.	208411.	648776.	450520.	85701.	111403.	1307707.	2607675.
1933	24082.	46552.	42972.	467637.	652307.	203285.	653535.	447525.	85564.	113606.	1304345.	2622457.
1934	24402.	47617.	43703.	475819.	660735.	197927.	657741.	443428.	85426.	115722.	1299095.	2636796.
1935	21364.	39005.	37661.	367730.	585145.	191062.	675295.	439357.	84478.	98030.	1306613.	2441976.
1936	20648.	37798.	36659.	349483.	571745.	186036.	667574.	434601.	84043.	95305.	1288211.	2388737.
1937	20304.	36508.	35646.	332065.	559468.	184817.	621182.	428316.	83678.	92457.	1234315.	2301948.
1938	19752.	35352.	34622.	315416.	546255.	183571.	577806.	421636.	83255.	89726.	1183013.	2211555.
1939	19233.	34137.	33589.	299633.	533466.	182413.	537150.	415921.	82023.	86959.	1135484.	2137554.
1940	18686.	32960.	32592.	284321.	520314.	181139.	499080.	409661.	82406.	84237.	1089880.	2061159.
1941	17953.	31496.	30990.	269289.	505273.	179238.	597421.	412226.	81503.	80439.	1188885.	2125330.
1942	17282.	30507.	29879.	271087.	490264.	177100.	590497.	409178.	87959.	77669.	1176775.	2103758.
1943	16696.	29541.	28945.	272338.	477519.	175225.	584625.	405561.	94713.	75182.	1165411.	2084142.
1944	16207.	28780.	28209.	273586.	466210.	173333.	579293.	401979.	98878.	73195.	1154605.	2066474.
1945	15781.	28098.	27531.	274762.	456640.	171623.	574235.	399167.	103449.	71411.	1145824.	2051295.
1946	15309.	27155.	26767.	273311.	442036.	166980.	566646.	393887.	105171.	69231.	1127512.	2017261.
1947	14525.	26173.	26079.	268981.	435855.	163577.	551129.	377899.	103054.	66777.	1092605.	1972272.
1948	13790.	25259.	25475.	263983.	430359.	160847.	537967.	365424.	110583.	64525.	1064238.	1933638.
1949	13132.	24399.	24890.	259282.	423841.	157874.	526471.	355559.	112692.	63021.	1039900.	1894736.
1950	13206.	25354.	27083.	265157.	425817.	158415.	543451.	349718.	117541.	65643.	1051584.	1926242.
1951	13346.	25879.	26995.	276716.	449482.	159196.	520169.	345194.	122253.	66220.	1024559.	1939230.
1952	13304.	26052.	27343.	268847.	449439.	160664.	534881.	342891.	123726.	66698.	1038436.	1947147.
1953	12935.	26496.	25377.	262649.	456532.	160574.	544224.	385602.	127743.	64808.	1090400.	2003131.
1954	12638.	26051.	26233.	252398.	457084.	160012.	529177.	374233.	128866.	64942.	1063423.	1966792.
1955	12298.	24770.	25214.	246348.	461257.	159876.	550868.	377987.	131061.	62283.	1098731.	1989679.
1956	11867.	22937.	23798.	237323.	462048.	160284.	559313.	381221.	131079.	58602.	1100819.	1988971.
1957	11484.	22557.	23056.	232115.	462570.	160083.	556137.	379101.	133344.	57097.	1101320.	1986447.
1958	11030.	20159.	21327.	224678.	467112.	160068.	562643.	392014.	134561.	52516.	1114724.	1998591.
1959	10943.	18376.	19912.	222083.	476943.	159266.	570758.	396612.	139154.	48931.	1126636.	2013744.
1960	10943.	18344.	20144.	219790.	476282.	161946.	589208.	409732.	140974.	49431.	1160885.	2047362.
1961	10943.	17180.	18633.	217503.	484058.	163244.	596817.	413619.	138879.	46756.	1173679.	2060875.
1962	10938.	17178.	18632.	217467.	483957.	163234.	596823.	413688.	138879.	46748.	1173745.	2060776.
1963	10941.	17178.	18632.	217483.	484059.	163207.	596955.	413630.	138871.	46751.	1173793.	2060956.
1964	10946.	17176.	18633.	217550.	484037.	163241.	596842.	413688.	138853.	46755.	1173770.	2060944.
1965	10925.	17798.	19591.	227769.	497292.	174912.	645767.	442869.	140744.	48315.	1263547.	2186666.

DEFLATED VALUE OF BUILDINGS IN AGRICULTURE 1926-65

—THOUSANDS OF DOLLARS—

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1926	18070.	45746.	40811.	244649.	429562.	63114.	146140.	82083.	25855.	104627.	291338.	1096031.
1927	17682.	49538.	41136.	284557.	487950.	65351.	169206.	99885.	31971.	108356.	334441.	1247276.
1928	18745.	43112.	39778.	262119.	452463.	65506.	175937.	101304.	32345.	101635.	343047.	1191699.
1929	18729.	44817.	43473.	269497.	441788.	66276.	169475.	106890.	33660.	107018.	342641.	1194603.
1930	22053.	43075.	39637.	279715.	455034.	69843.	183129.	113875.	34872.	104764.	366847.	1241732.
1931	21540.	48131.	42016.	278086.	479841.	72169.	194904.	118205.	41818.	111693.	385277.	1296715.
1932	21317.	49938.	41916.	273127.	427934.	68258.	179245.	110393.	40574.	113171.	357896.	1212702.
1933	20406.	42697.	38781.	241637.	395318.	62927.	167579.	97615.	37250.	101865.	328121.	1104210.
1934	20685.	41914.	36886.	213486.	404857.	63371.	161200.	94486.	34543.	99486.	319057.	1079428.
1935	18599.	47158.	37830.	249455.	407635.	62170.	170695.	94661.	33639.	103588.	327526.	1121842.
1936	18541.	46803.	37127.	199666.	373535.	51105.	133839.	84686.	31295.	99871.	269630.	973998.
1937	18754.	37029.	30198.	181578.	341789.	47976.	115156.	76771.	27162.	82981.	239903.	873413.
1938	18060.	35968.	33764.	193060.	350498.	48987.	121732.	80167.	31054.	87701.	250886.	922290.
1939	15703.	36401.	32377.	187234.	327567.	46924.	106522.	78978.	28469.	84482.	232424.	860176.
1940	13147.	28017.	24375.	168534.	297780.	40625.	94978.	74483.	25711.	65539.	210086.	767651.
1941	12578.	27539.	22891.	167832.	258496.	39258.	78281.	61406.	24531.	63008.	178945.	692813.
1942	11376.	24430.	22836.	160168.	231225.	37627.	75541.	60125.	24138.	58641.	173293.	647444.
1943	10561.	24103.	23349.	162821.	252368.	39627.	75227.	64773.	25179.	58013.	179626.	676648.
1944	10292.	24699.	24942.	148350.	232528.	38402.	78376.	63935.	24841.	60133.	180713.	666564.
1945	10466.	24181.	24281.	146003.	223850.	41050.	84462.	69550.	27334.	58928.	195062.	691177.
1946	9986.	24371.	23271.	153271.	232086.	52920.	93561.	78219.	31923.	57629.	224701.	699610.
1947	10689.	25122.	24668.	155122.	234811.	52122.	95212.	84721.	33939.	60419.	232056.	716346.
1948	10063.	22483.	20924.	142381.	211093.	51965.	86950.	83351.	30543.	53370.	222266.	659589.
1949	9971.	21557.	20488.	132464.	210967.	51327.	80806.	82063.	32043.	52018.	214196.	641627.
1950	9862.	21345.	20221.	140939.	209851.	47288.	74135.	75491.	29684.	51427.	196913.	628814.
1951	8942.	18727.	17500.	130150.	194906.	41463.	64795.	66463.	26767.	45169.	172720.	569712.
1952	8790.	18242.	16999.	131513.	197095.	41689.	67516.	66945.	26610.	44031.	176151.	576330.
1953	8947.	17796.	16798.	134693.	217769.	47868.	71798.	82362.	29647.	43541.	202028.	627678.
1954	8910.	18008.	16843.	142479.	230029.	45343.	69949.	76270.	32063.	43761.	191563.	639395.
1955	9094.	18090.	16747.	145900.	251307.	47212.	79460.	80976.	35207.	43890.	207648.	683952.
1956	9227.	17534.	16117.	148771.	258863.	49956.	84325.	84891.	36441.	42878.	219170.	706144.
1957	9229.	17328.	15737.	148695.	268668.	48337.	84984.	85235.	39786.	42295.	218556.	717989.
1958	9847.	17281.	15555.	155665.	297922.	51705.	91900.	97977.	43622.	42684.	241642.	781535.
1959	10173.	16841.	15143.	157975.	326823.	49525.	95834.	99517.	47623.	42158.	244876.	819456.
1960	10262.	16989.	15200.	162848.	326654.	53501.	102728.	107252.	48796.	42450.	263481.	844731.
1961	10304.	16889.	15034.	166897.	356071.	56886.	108647.	112203.	49569.	42226.	277736.	892499.
1962	10692.	16309.	14250.	164032.	368612.	57630.	116828.	118165.	50394.	41251.	292623.	916012.
1963	10594.	15930.	13703.	165232.	367515.	60305.	133926.	125954.	49877.	40232.	320184.	943040.
1964	10235.	15618.	13504.	161535.	375415.	62647.	145534.	130842.	47974.	39357.	339023.	963304.
1965	10077.	15564.	13531.	165144.	386071.	68941.	169126.	145909.	51265.	39172.	383977.	1025629.

DEFLATED VALUE OF MACHINERY IN AGRICULTURE 1926-65

-THOUSANDS OF DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1926	7234.	9991.	12961.	98937.	165213.	59268.	173343.	89788.	11151.	30186.	327400.	627887.
1927	7428.	10125.	13019.	98355.	165147.	68622.	192187.	110063.	11653.	30570.	370873.	676598.
1928	7875.	10591.	13524.	100774.	170045.	77745.	214858.	131339.	12510.	31991.	423943.	739269.
1929	8512.	11294.	14322.	105270.	177040.	83658.	235952.	149515.	13652.	34128.	469125.	799214.
1930	8665.	11406.	14413.	105398.	172764.	74905.	224878.	143152.	13891.	34505.	442935.	769402.
1931	8588.	11168.	14023.	102931.	160770.	57734.	195274.	122422.	13564.	33780.	375429.	684475.
1932	8343.	11100.	13699.	101671.	158765.	53282.	179840.	114790.	13750.	33123.	347912.	659221.
1933	8079.	11073.	13415.	100596.	156956.	50177.	170628.	110732.	13900.	32567.	331537.	639556.
1934	7490.	10573.	12561.	94990.	148602.	44978.	153603.	101377.	13428.	30624.	299958.	587622.
1935	7041.	10244.	12001.	90980.	143579.	42455.	142586.	96421.	13480.	29185.	281468.	558687.
1936	6586.	9884.	11250.	86772.	139892.	41161.	134319.	92136.	13500.	27720.	267616.	535500.
1937	6431.	10124.	11177.	86603.	142298.	43345.	133382.	94101.	14121.	27733.	270829.	541593.
1938	5896.	9757.	10441.	81399.	135663.	46502.	124307.	93332.	13798.	26095.	264141.	521030.
1939	5751.	9950.	10300.	81435.	138085.	52255.	125839.	89849.	14005.	26060.	267943.	527529.
1940	5494.	9936.	10071.	79261.	136388.	53075.	125276.	103097.	13836.	25501.	281447.	536434.
1941	6200.	9992.	9868.	77669.	137064.	54124.	131208.	152691.	13904.	26059.	338023.	592720.
1942	5574.	10209.	10205.	81482.	147214.	57555.	138707.	110067.	15626.	25989.	306329.	576639.
1943	5990.	10668.	10781.	86155.	160080.	62470.	147977.	115316.	17601.	27438.	325763.	617037.
1944	6351.	11018.	11251.	90220.	167316.	64816.	153951.	117761.	19281.	28619.	336528.	641955.
1945	7118.	12071.	12439.	99330.	186165.	73929.	174775.	130561.	22276.	31628.	379265.	718664.
1946	7627.	12678.	13168.	103751.	195886.	79456.	188100.	137466.	24344.	33473.	405023.	767478.
1947	8127.	13285.	13890.	107544.	204287.	85676.	203931.	150026.	26498.	35299.	430633.	813261.
1948	8182.	13179.	13869.	106781.	206297.	90537.	217207.	161024.	27587.	35230.	460769.	844664.
1949	8315.	13219.	13999.	107291.	212520.	99143.	235141.	175949.	29206.	35524.	510234.	894774.
1950	8957.	14062.	14960.	115897.	237990.	121402.	271492.	202720.	32395.	37979.	595614.	1019875.
1951	8780.	13620.	14563.	114437.	240431.	123693.	280494.	208113.	31355.	36963.	612299.	1035486.
1952	9234.	14648.	14989.	118317.	251693.	126405.	284823.	213490.	31749.	38271.	624718.	1064747.
1953	10367.	15237.	16202.	126369.	267682.	135261.	312383.	232505.	33881.	41806.	680149.	1149837.
1954	11008.	15915.	16862.	129271.	273419.	137579.	330967.	242067.	34727.	43726.	710612.	1191755.
1955	10824.	15316.	16157.	126230.	265812.	130617.	317800.	233296.	34006.	42297.	681713.	1150859.
1956	10577.	14742.	15417.	122192.	252814.	120049.	293100.	218375.	34370.	40736.	631524.	1081635.
1957	10690.	14412.	15019.	121148.	247699.	116102.	284791.	214547.	34611.	40121.	615441.	1059020.
1958	10513.	13452.	14201.	120353.	240554.	110859.	274741.	211027.	34067.	38166.	596627.	1029756.
1959	10300.	12744.	13469.	119078.	234115.	107102.	267385.	210221.	33630.	36574.	584768.	1008164.
1960	10398.	12241.	12940.	118983.	231762.	107299.	268755.	215014.	34027.	35579.	591069.	1011419.
1961	10115.	11394.	11933.	113468.	218185.	104703.	264367.	212038.	33290.	33443.	581109.	979495.
1962	10306.	11685.	12054.	118183.	219447.	104841.	261868.	214371.	33593.	34047.	581079.	986349.
1963	10575.	11906.	12353.	125590.	226329.	108708.	268293.	220283.	33981.	34633.	597285.	1018017.
1964	10698.	12055.	12510.	130057.	232509.	114839.	280091.	226232.	34370.	35264.	621162.	1053561.
1965	10993.	12386.	12865.	133498.	241619.	122675.	296661.	235590.	35156.	36243.	654926.	1101442.

DEFLATED VALUE OF LIVESTOCK IN AGRICULTURE 1926-65

-THOUSANDS OF DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1926	9931.	15767.	14305.	107537.	196382.	48793.	111744.	81625.	18754.	40003.	242163.	604839.
1927	10711.	16554.	14583.	119753.	223351.	54780.	115539.	98028.	21982.	41848.	268347.	675211.
1928	11257.	17308.	15179.	127404.	224620.	53571.	108799.	90170.	24900.	43744.	252540.	673209.
1929	10777.	16975.	14926.	136635.	215434.	49094.	96222.	88506.	25517.	42679.	233822.	654086.
1930	9205.	16269.	14195.	113185.	185699.	43329.	88068.	73864.	23399.	39669.	205261.	567213.
1931	7883.	15099.	13566.	104954.	181489.	44077.	89319.	78598.	21237.	38646.	211993.	558319.
1932	8067.	16796.	17838.	114240.	182620.	47728.	98964.	82111.	22785.	42722.	228803.	591176.
1933	8860.	17083.	18126.	110613.	205708.	52896.	110133.	96348.	24244.	44088.	259378.	644031.
1934	7679.	12429.	14311.	93992.	165952.	41684.	92325.	84153.	20180.	33819.	218161.	532104.
1935	7748.	12357.	14401.	101286.	188666.	44256.	100976.	87319.	18469.	34506.	232551.	578417.
1936	8079.	13515.	15372.	107585.	205144.	49406.	105246.	88951.	20518.	36966.	243603.	613816.
1937	7473.	13608.	14322.	110972.	188836.	48750.	86458.	80944.	18906.	35403.	216151.	569467.
1938	7341.	13103.	13698.	110799.	188625.	48079.	76002.	82770.	19143.	34442.	204851.	559959.
1939	7721.	13879.	15420.	121283.	216559.	54152.	90721.	94543.	19668.	37020.	239416.	633045.
1940	6904.	13653.	14522.	125169.	208760.	54289.	93809.	100148.	21025.	34779.	248247.	687380.
1941	4863.	9674.	10048.	91805.	165557.	40520.	75413.	82628.	16461.	24585.	198562.	496070.
1942	6050.	10361.	10063.	90896.	170759.	43169.	79794.	82618.	16983.	26494.	205580.	516712.
1943	7619.	13512.	15158.	137629.	213122.	54264.	102855.	108671.	20430.	36289.	269791.	673251.
1944	7508.	13410.	14559.	131935.	200062.	50924.	100121.	105987.	20895.	35465.	257022.	645389.
1945	7671.	12981.	13563.	123907.	201796.	46553.	86287.	94417.	20802.	34154.	227258.	607677.
1946	7411.	13452.	13127.	126422.	204968.	42391.	76400.	86354.	20419.	33991.	205146.	590946.
1947	6670.	12721.	12336.	120305.	192602.	42671.	76108.	87729.	19226.	31726.	206588.	578367.
1948	5867.	9781.	9837.	96725.	163153.	34509.	60521.	73318.	15625.	24985.	168347.	468837.
1949	6216.	9631.	10100.	104191.	177990.	39066.	67060.	81161.	16096.	25947.	187287.	514172.
1950	6320.	10728.	10057.	102253.	184016.	36330.	66034.	83086.	16605.	27104.	185451.	519429.
1951	7329.	10459.	10194.	107568.	216502.	41095.	74492.	100882.	18949.	27981.	216469.	587469.
1952	7345.	12890.	11193.	125263.	213689.	44955.	86093.	114268.	20611.	31427.	245315.	636336.
1953	6399.	11130.	10487.	111426.	191882.	42759.	79757.	109792.	21058.	28016.	231808.	584100.
1954	6289.	10219.	9351.	104463.	184028.	38429.	72411.	104464.	20342.	25859.	215303.	540995.
1955	6627.	11018.	10142.	106333.	194947.	42778.	80994.	114695.	21664.	27787.	238467.	589197.
1956	6163.	10034.	9781.	108276.	181076.	41305.	81398.	109994.	20709.	25979.	232698.	568787.
1957	5867.	9023.	8799.	103563.	187927.	39980.	81865.	120609.	19996.	23629.	242454.	577870.
1958	6190.	9659.	9519.	116425.	220730.	47783.	96214.	135922.	23377.	24747.	279919.	665198.
1959	6677.	10378.	9717.	122148.	230686.	52441.	101543.	145657.	26061.	26774.	299641.	705310.
1960	6662.	10464.	9414.	123532.	229870.	51981.	98862.	141612.	25873.	26540.	292655.	698469.
1961	6593.	10358.	9182.	120479.	230841.	55293.	108658.	152962.	27371.	26134.	316913.	721737.
1962	6320.	10049.	8399.	122036.	234966.	51877.	99947.	141254.	26700.	24768.	293077.	701548.
1963	6681.	10334.	8589.	129134.	239825.	58083.	110973.	157651.	29600.	25605.	326707.	750871.
1964	6998.	10418.	8797.	127106.	248111.	63929.	121557.	172204.	31549.	26208.	357691.	790666.
1965	6762.	9522.	7936.	119349.	230379.	54874.	104130.	148538.	28432.	24220.	307242.	709622.

DEFLATED VALUE OF TOTAL ASSETS IN AGRICULTURE 1926-65

-THOUSANDS OF DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1926	53510.	114328.	120120.	879040.	1378787.	380026.	987221.	592827.	142209.	287958.	1960074.	4649660.
1927	57494.	116895.	124291.	879659.	1410385.	413863.	1002143.	614725.	140826.	298380.	2030731.	4759992.
1928	56302.	118920.	121307.	893901.	1413513.	419214.	994950.	625048.	142514.	296528.	2039212.	4785667.
1929	56522.	115577.	115406.	896447.	1420667.	428311.	1038431.	641898.	144046.	287505.	2108630.	4857284.
1930	60151.	112592.	105747.	903984.	1396238.	387061.	1114335.	764446.	157449.	278489.	2265841.	5002001.
1931	61490.	116563.	113201.	935337.	1457273.	366382.	1124361.	772864.	162469.	293253.	2283607.	5131938.
1932	61508.	123216.	115694.	948070.	1413160.	377680.	1106824.	757814.	162809.	300418.	2242318.	5066774.
1933	61448.	117405.	113294.	920484.	1410288.	369284.	1101876.	752220.	160958.	292146.	2223380.	5007254.
1934	59656.	112584.	107401.	878287.	1380145.	347960.	1064867.	723444.	153577.	279651.	2136269.	4827927.
1935	54753.	108764.	101792.	809450.	1325023.	340844.	1089552.	717758.	150006.	265309.	2148152.	4807399.
1936	51855.	107600.	100402.	748506.	1290816.	327707.	1040977.	700375.	149357.	259862.	2060058.	4512098.
1937	49962.	97268.	91343.	711217.	1231591.	324888.	956179.	680131.	143867.	238573.	1961198.	4286449.
1938	51049.	94180.	92825.	700674.	1230041.	327139.	899847.	677905.	147249.	238055.	1904890.	4222849.
1939	48407.	94367.	91747.	689586.	1215677.	335744.	860232.	679290.	144164.	234521.	1875265.	4159212.
1940	44230.	84267.	81560.	657286.	1163242.	329128.	813144.	687389.	142978.	210056.	1829659.	4003220.
1941	41593.	78701.	73797.	606595.	1066389.	313140.	882324.	708952.	136401.	194091.	1904415.	3907830.
1942	40283.	75507.	73003.	609632.	1039461.	315451.	884539.	661988.	144705.	188793.	1861976.	3844567.
1943	40865.	77624.	78233.	658943.	1103109.	331586.	910685.	694321.	156922.	196922.	1936590.	4052480.
1944	40359.	78114.	78940.	644091.	1066114.	327475.	911741.	689662.	163896.	197413.	1928878.	4008391.
1945	41036.	77380.	77754.	644002.	1068410.	333155.	919760.	693696.	173861.	196120.	1946609.	4028601.
1946	40333.	77656.	76334.	656756.	1074975.	341747.	924708.	695927.	181658.	194324.	1962381.	4070292.
1947	40010.	77298.	76912.	651952.	1067555.	344046.	926381.	700375.	187717.	194221.	1970801.	4072234.
1948	37402.	70803.	70105.	609870.	1016902.	337858.	902645.	683117.	184338.	178110.	1923620.	3996840.
1949	37634.	69407.	69466.	603229.	1025218.	347410.	909478.	694728.	190038.	176508.	1951616.	3946606.
1950	38244.	71489.	72320.	624245.	1057174.	363434.	955112.	711016.	196225.	182154.	2029562.	4089358.
1951	38397.	68684.	69252.	626871.	1101321.	365446.	939960.	720651.	199325.	176332.	2026047.	4131895.
1952	38674.	71231.	70524.	643941.	1112816.	373713.	973314.	737594.	202696.	180428.	2084620.	4224469.
1953	38048.	70656.	68865.	635137.	1133864.	386463.	1008163.	809761.	212329.	178171.	2204385.	4363884.
1954	38645.	70224.	69229.	628611.	1144559.	381382.	1002505.	797034.	215998.	178298.	2180901.	4346365.
1955	38803.	69194.	69260.	624811.	1173323.	380482.	1029123.	806954.	222738.	176257.	2216559.	4413696.
1956	37834.	65247.	65113.	616562.	1154821.	371595.	1018134.	794482.	222599.	168195.	2184210.	4346384.
1957	37210.	63321.	62611.	605520.	1166865.	370502.	1007778.	799492.	227738.	163142.	2177770.	4341033.
1958	37580.	59932.	60601.	617122.	1226316.	370414.	1025559.	836940.	235627.	158113.	2232911.	4479087.
1959	38155.	58040.	58241.	621285.	1268566.	368394.	1035521.	852007.	246467.	154436.	2255922.	4546674.
1960	38264.	58038.	57697.	625154.	1264569.	374727.	1059553.	873810.	249669.	153999.	2308089.	4601480.
1961	37954.	55822.	54782.	618346.	1289154.	380126.	1078489.	890822.	249109.	148558.	2342437.	4656494.
1962	38258.	55221.	53335.	621719.	1306982.	377582.	1079465.	887477.	249566.	146814.	2343523.	4660032.
1963	38791.	55354.	53276.	637439.	1317727.	390303.	1110147.	917518.	252328.	147421.	2417967.	4772882.
1964	38872.	55268.	53444.	636229.	1340071.	404656.	1144024.	942966.	252746.	147584.	2491646.	4866274.
1965	38756.	55271.	53923.	643761.	1355361.	421102.	1215683.	972906.	264596.	147950.	2609691.	5023357.

INDEX OF DEFLATED VALUE OF AGGREGATE FARM CAPITAL-(1940=100)

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1926	121.0	135.7	147.3	133.7	118.5	115.5	121.4	86.2	100.2	137.1	107.1	116.1
1927	130.0	138.4	152.4	133.8	121.2	125.7	123.2	89.4	98.5	142.0	111.0	118.4
1928	127.3	141.1	148.7	136.0	121.5	127.4	122.4	90.9	99.7	141.2	111.5	119.5
1929	127.8	137.2	141.5	136.4	122.1	130.1	127.7	93.4	100.7	136.9	115.2	121.3
1930	130.0	133.6	129.7	137.5	120.0	117.6	137.0	111.2	110.1	132.6	123.8	124.9
1931	139.0	140.7	136.8	142.3	125.3	117.4	138.3	112.4	113.6	139.6	124.8	129.2
1932	139.1	146.2	141.9	144.2	121.5	114.8	136.1	110.2	113.9	143.0	122.6	126.6
1933	138.9	139.3	138.9	140.0	121.2	112.2	135.5	109.4	112.6	139.1	121.5	125.1
1934	134.9	133.5	131.8	133.6	118.6	105.7	131.0	105.2	107.4	133.1	116.8	121.6
1935	126.8	129.1	124.8	123.2	113.9	103.6	134.0	104.4	104.9	126.3	117.4	117.4
1936	117.2	127.7	123.1	113.1	110.9	99.6	128.0	101.9	104.5	123.7	113.1	112.7
1937	113.0	115.4	112.0	108.2	105.9	98.7	117.6	98.9	100.6	113.6	107.2	107.1
1938	115.4	111.8	113.8	106.6	105.7	99.4	110.7	98.6	103.0	113.3	104.1	105.4
1939	109.4	112.0	112.5	104.9	104.5	102.0	105.8	98.8	100.8	111.6	102.5	103.9
1940	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1941	94.0	93.4	90.5	92.3	91.7	95.1	108.5	103.1	95.4	92.4	104.1	97.6
1942	91.1	89.6	89.5	92.7	89.4	95.8	108.8	96.3	101.2	89.9	101.8	96.0
1943	92.4	92.4	95.9	100.3	94.8	100.7	112.0	101.0	109.8	93.7	105.8	101.2
1944	91.2	92.7	96.8	98.0	91.7	99.5	112.1	100.3	114.6	94.0	105.4	99.9
1945	92.8	91.8	95.3	98.0	91.8	101.2	113.1	100.9	121.6	95.4	106.4	100.6
1946	91.2	92.2	93.6	99.9	92.4	103.8	118.7	101.2	127.2	92.5	107.3	101.7
1947	90.5	91.7	94.3	99.2	91.8	104.5	113.9	101.9	131.3	92.5	107.7	101.7
1948	84.6	83.8	86.0	92.8	86.9	102.7	111.0	99.4	128.9	84.8	105.1	97.6
1949	85.1	82.4	85.2	91.8	88.1	105.6	111.8	101.1	132.9	84.0	106.7	98.6
1950	86.7	84.8	88.7	95.0	90.9	110.4	117.5	103.4	137.2	86.7	110.9	102.2
1951	86.8	81.5	84.9	95.7	94.7	111.0	115.6	104.8	139.4	83.9	110.7	103.2
1952	87.4	84.5	86.5	98.0	95.7	113.5	119.7	107.3	141.8	85.9	113.9	105.9
1953	87.4	83.9	84.4	96.6	97.5	117.4	124.0	117.8	148.5	84.8	120.5	109.0
1954	87.8	83.3	84.9	95.6	98.4	115.9	123.3	116.0	151.1	84.9	119.2	108.6
1955	87.7	82.1	83.7	95.1	100.9	115.6	126.6	117.4	155.8	83.9	121.1	110.3
1956	85.5	77.4	79.8	93.8	99.3	112.9	125.2	115.6	156.7	80.1	119.4	108.6
1957	84.1	75.1	76.8	92.1	100.3	112.6	123.9	116.3	159.3	77.7	119.0	108.4
1958	85.0	71.1	74.3	93.9	105.4	112.5	126.1	121.8	164.8	75.3	122.0	111.7
1959	86.3	68.9	71.4	94.5	109.1	111.9	127.3	123.9	172.4	73.6	123.3	113.6
1960	86.5	68.9	70.7	95.1	108.7	113.9	130.3	127.1	174.6	73.3	126.1	114.9
1961	85.8	66.2	67.2	94.1	110.8	115.5	132.6	129.6	174.2	70.7	128.4	114.8
1962	86.5	65.5	65.4	94.6	112.4	114.7	132.3	129.1	174.5	69.9	127.9	115.5
1963	87.7	65.7	65.3	97.0	113.3	118.6	136.5	133.5	176.5	70.2	132.2	119.2
1964	87.9	65.6	65.5	96.8	115.2	122.9	140.7	137.2	176.8	70.3	136.2	121.6
1965	87.6	65.6	66.1	98.2	116.6	127.9	149.5	141.5	185.1	70.4	142.6	125.5

INDEX OF DEFLATED VALUE OF AGGREGATE FARM CAPITAL-(CANADA=100)

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR
1926	1.2	2.5	2.6	18.9	29.7	8.2	21.2	12.8	3.1	6.2	42.2
1927	1.2	2.4	2.6	18.5	29.6	8.7	21.1	12.9	3.0	6.3	42.7
1928	1.2	2.5	2.5	18.7	29.5	8.8	20.8	13.1	3.0	6.2	42.6
1929	1.2	2.4	2.4	18.5	29.2	8.8	21.4	13.2	3.0	5.9	43.4
1930	1.2	2.3	2.1	18.1	27.9	7.7	22.3	15.3	3.1	5.6	45.3
1931	1.2	2.3	2.2	18.2	28.4	7.5	21.9	15.1	3.2	5.7	44.5
1932	1.2	2.4	2.3	18.7	27.9	7.5	21.8	15.0	3.2	5.9	44.3
1933	1.2	2.3	2.3	18.4	28.2	7.4	22.0	15.0	3.2	5.8	44.4
1934	1.2	2.3	2.2	18.2	28.6	7.2	22.1	15.0	3.2	5.8	44.2
1935	1.2	2.3	2.2	17.2	28.2	7.3	23.2	15.3	3.2	5.6	45.7
1936	1.1	2.4	2.2	16.5	28.6	7.3	23.1	15.5	3.3	5.8	45.9
1937	1.2	2.3	2.1	16.6	28.7	7.6	22.3	15.9	3.4	5.6	45.8
1938	1.2	2.2	2.2	16.6	29.1	7.8	21.3	16.1	3.5	5.6	45.1
1939	1.2	2.3	2.2	16.6	29.2	8.1	20.7	16.3	3.5	5.6	45.1
1940	1.1	2.1	2.0	16.4	29.1	8.2	20.3	17.2	3.6	5.2	45.7
1941	1.1	2.0	1.9	15.5	27.3	8.0	22.6	18.1	3.5	5.0	48.7
1942	1.0	2.0	1.9	15.9	27.0	8.2	23.0	17.2	3.8	4.9	48.4
1943	1.0	1.9	1.9	16.3	27.2	8.2	22.5	17.1	3.9	4.9	47.8
1944	1.0	2.0	2.0	16.1	26.7	8.2	22.8	17.2	4.1	4.9	48.2
1945	1.0	1.9	1.9	16.0	26.5	8.3	22.8	17.2	4.3	4.9	48.3
1946	1.0	1.9	1.9	16.1	26.4	8.4	22.7	17.1	4.5	4.8	48.2
1947	1.0	1.9	1.9	16.0	26.2	8.4	22.7	17.2	4.6	4.8	48.4
1948	1.0	1.8	1.8	15.6	25.9	8.6	23.1	17.5	4.7	4.6	49.2
1949	1.0	1.8	1.8	15.3	26.0	8.8	23.0	17.6	4.8	4.5	49.5
1950	0.9	1.7	1.8	15.3	25.9	8.9	23.4	17.4	4.8	4.5	49.6
1951	0.9	1.7	1.7	15.2	26.7	8.8	22.7	17.4	4.8	4.3	49.0
1952	0.9	1.7	1.7	15.2	26.3	8.8	23.0	17.5	4.8	4.3	49.3
1953	0.9	1.6	1.6	14.6	26.0	8.9	23.1	18.6	4.9	4.1	50.5
1954	0.9	1.6	1.6	14.5	26.3	8.8	23.1	18.3	5.0	4.1	50.2
1955	0.9	1.6	1.5	14.2	26.6	8.6	23.3	18.3	5.0	4.0	50.2
1956	0.9	1.5	1.5	14.2	26.6	8.5	23.4	18.3	5.1	3.9	50.3
1957	0.9	1.5	1.4	13.9	26.9	8.5	23.2	18.4	5.2	3.8	50.2
1958	0.8	1.3	1.4	13.8	27.4	8.3	22.9	18.7	5.3	3.5	50.0
1959	0.8	1.3	1.3	13.7	27.9	8.1	22.8	18.7	5.4	3.4	49.6
1960	0.8	1.3	1.3	13.6	27.5	8.1	23.0	19.0	5.4	3.3	50.2
1961	0.8	1.2	1.2	13.3	27.7	8.2	23.2	19.1	5.4	3.2	50.5
1962	0.8	1.2	1.1	13.3	28.0	8.1	23.1	19.0	5.3	3.1	50.2
1963	0.8	1.2	1.1	13.4	27.6	8.2	23.3	19.2	5.3	3.1	50.7
1964	0.8	1.1	1.1	13.1	27.5	8.3	23.5	19.4	5.2	3.0	51.2
1965	0.8	1.1	1.1	12.9	27.0	8.4	24.2	19.4	5.3	2.9	52.0

CURRENT VALUE OF LAND PER FARM OPERATOR 1931-65

-DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1931	1683.	1439.	1903.	3323.	4539.	4987.	8600.	8351.	6333.	1649.	7736.	5166.
1932	1543.	1374.	1647.	2957.	3647.	4129.	6916.	6701.	5247.	1509.	6241.	4253.
1933	1525.	1277.	1579.	2774.	3575.	3780.	6566.	5873.	4810.	1457.	5734.	4000.
1934	1737.	1309.	1494.	2545.	3739.	3756.	6306.	5613.	4244.	1463.	5508.	3887.
1935	1386.	1192.	1245.	2256.	3269.	3471.	6452.	5218.	3954.	1250.	5402.	3680.
1936	1353.	1265.	1267.	1895.	3232.	3050.	5494.	4933.	3716.	1292.	4784.	3299.
1937	1466.	1100.	1083.	1801.	3212.	3085.	4903.	4635.	3427.	1158.	4424.	3113.
1938	1543.	934.	1021.	1646.	2937.	2764.	4358.	4091.	3528.	1072.	3925.	2825.
1939	1461.	1000.	1002.	1540.	2900.	2811.	3887.	4082.	3337.	1076.	3723.	2725.
1940	1432.	866.	823.	1597.	2938.	2714.	3736.	4155.	3240.	935.	3658.	2681.
1941	1677.	1102.	969.	2003.	3239.	3313.	4907.	4833.	3947.	1140.	4541.	3237.
1942	1934.	1316.	1317.	2507.	3763.	3948.	6007.	5779.	4622.	1420.	5487.	3896.
1943	1869.	1411.	1462.	2792.	4500.	3982.	5817.	5827.	5184.	1512.	5424.	4183.
1944	1695.	1596.	1712.	2564.	4144.	4143.	6616.	6076.	4876.	1699.	5893.	4198.
1945	1863.	1565.	1692.	2448.	3832.	4189.	6829.	6122.	4807.	1674.	6009.	4140.
1946	1590.	1460.	1516.	2300.	3491.	4458.	6617.	5781.	5197.	1508.	5851.	3934.
1947	1661.	1581.	1707.	2382.	3756.	4883.	7455.	6840.	4905.	1649.	6673.	4330.
1948	1712.	1655.	1745.	2385.	3917.	5946.	8308.	8112.	5106.	1703.	7717.	4776.
1949	1670.	1748.	1812.	2221.	4053.	6273.	8365.	8427.	5349.	1758.	7925.	4865.
1950	1843.	2040.	2436.	2635.	4431.	7056.	9437.	9055.	5974.	2153.	8769.	5437.
1951	2140.	2392.	2708.	3286.	5953.	8178.	10961.	10064.	6807.	2458.	10012.	6407.
1952	2292.	2602.	2951.	3438.	6380.	8930.	12517.	10556.	6964.	2665.	11000.	7018.
1953	2271.	2778.	3076.	3474.	7002.	10494.	13813.	14179.	7655.	2770.	13203.	8091.
1954	2086.	2769.	3081.	3370.	6930.	9188.	12597.	12500.	7427.	2718.	11790.	7451.
1955	2129.	2949.	3340.	3494.	7779.	9923.	15061.	13629.	8198.	2887.	13351.	8239.
1956	2281.	3229.	3683.	3716.	8443.	10960.	15971.	15765.	8348.	3148.	14753.	9055.
1957	2304.	3382.	3863.	3746.	9025.	11102.	17732.	15324.	8962.	3272.	15288.	9427.
1958	2486.	3632.	4121.	3966.	10213.	10343.	16660.	15007.	10137.	3511.	14568.	10604.
1959	2677.	3840.	4424.	4188.	11652.	12563.	22043.	19260.	11266.	3723.	18767.	11595.
1960	2710.	3995.	4625.	4390.	11739.	14235.	25162.	21702.	11348.	3848.	21266.	12521.
1961	2851.	4306.	4950.	4560.	12962.	15160.	27016.	22618.	11348.	4103.	22513.	13357.
1962	3141.	4592.	5175.	4764.	14117.	16451.	31645.	25571.	12031.	4355.	25664.	14770.
1963	3276.	4825.	5347.	5052.	14535.	17984.	38483.	28302.	11769.	4529.	29569.	16309.
1964	3418.	5366.	5901.	5304.	15928.	20182.	45883.	31660.	12189.	4931.	34051.	18346.
1965	3965.	6560.	7219.	6264.	18036.	25091.	61078.	39858.	14485.	5938.	43896.	22851.

CURRENT VALUE OF BUILDINGS PER FARM OPERATOR 1931-65

-DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1931	1340.	1529.	1767.	1860.	2963.	1413.	1812.	1537.	2172.	1565.	1636.	2034.
1932	1194.	1384.	1473.	1563.	2301.	1151.	1434.	1238.	1806.	1373.	1309.	1641.
1933	1220.	1225.	1361.	1386.	2179.	1056.	1340.	1088.	1664.	1272.	1196.	1507.
1934	1260.	1195.	1241.	1205.	2200.	1052.	1267.	1047.	1511.	1226.	1144.	1440.
1935	1133.	1296.	1177.	1333.	2126.	979.	1276.	979.	1395.	1219.	1114.	1435.
1936	1112.	1381.	1204.	1136.	2101.	866.	1072.	935.	1324.	1262.	983.	1333.
1937	1215.	1212.	1035.	1097.	2087.	871.	988.	903.	1230.	1142.	935.	1283.
1938	1292.	1035.	983.	1019.	1908.	774.	906.	817.	1277.	1057.	848.	1134.
1939	1230.	1110.	972.	1033.	1884.	782.	838.	838.	1231.	1074.	824.	1164.
1940	1220.	976.	803.	1024.	1908.	750.	825.	876.	1193.	939.	826.	1152.
1941	1477.	1273.	990.	1310.	2121.	929.	882.	921.	1495.	1186.	955.	1340.
1942	1712.	1523.	1350.	1646.	2479.	1172.	1137.	1183.	1785.	1481.	1160.	1648.
1943	1664.	1842.	1505.	1841.	2983.	1240.	1153.	1274.	2041.	1588.	1213.	1836.
1944	1693.	1861.	1765.	1697.	2769.	1353.	1369.	1410.	1957.	1791.	1380.	1854.
1945	1670.	1828.	1752.	1628.	2578.	1425.	1471.	1499.	2001.	1767.	1471.	1827.
1946	1444.	1748.	1597.	1569.	2447.	1686.	1513.	1536.	2334.	1627.	1559.	1805.
1947	1608.	1953.	1828.	1708.	2633.	1847.	1734.	1851.	2285.	1832.	1800.	2007.
1948	1700.	2110.	1898.	1808.	2745.	2249.	1965.	2235.	2466.	1953.	2124.	2198.
1949	1834.	2209.	2008.	1769.	2868.	2413.	2011.	2364.	2677.	2048.	2227.	2276.
1950	1932.	2443.	2226.	2011.	3032.	2573.	2164.	2503.	2863.	2243.	2378.	2460.
1951	2132.	2688.	2434.	2286.	3446.	2817.	2390.	2739.	3124.	2461.	2613.	2752.
1952	2285.	2975.	2677.	2500.	3789.	3046.	2717.	2963.	3159.	2697.	2884.	3015.
1953	2394.	3076.	2833.	2640.	4268.	3679.	3088.	3818.	3588.	2818.	3493.	3425.
1954	2322.	3159.	2864.	2685.	4335.	3311.	2900.	3347.	3597.	2838.	3161.	3345.
1955	2495.	3459.	3118.	2909.	5010.	3660.	3553.	3760.	4103.	3084.	3655.	3795.
1956	2826.	3895.	3500.	3231.	5580.	4155.	3878.	4486.	4316.	3466.	4150.	4251.
1957	3027.	4205.	3728.	3414.	6122.	4258.	4431.	4471.	4785.	3713.	4466.	4574.
1958	3456.	4644.	4035.	3775.	7110.	4012.	4284.	4515.	5592.	4107.	4311.	5262.
1959	3726.	4910.	4331.	3987.	8111.	4874.	5752.	5795.	6214.	4365.	5566.	5794.
1960	3772.	5109.	4525.	4179.	8172.	5522.	6566.	6530.	6260.	4513.	6509.	6135.
1961	3966.	5503.	4845.	4341.	9024.	5882.	7049.	6805.	6260.	4815.	6681.	6558.
1962	4373.	5867.	5065.	4535.	9527.	6382.	8257.	7694.	6635.	5132.	7593.	7171.
1963	4560.	6165.	5234.	4809.	10118.	6976.	10042.	8515.	6491.	5346.	8707.	7729.
1964	4754.	6861.	5776.	5050.	11095.	7829.	11972.	9526.	6723.	5816.	10002.	8544.
1965	5516.	8385.	7065.	5963.	12974.	9733.	15937.	11992.	7989.	6997.	12858.	10407.

CURRENT VALUE OF MACHINERY PER FARM OPERATOR 1931-65

-DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1931	572.	380.	631.	737.	1062.	1216.	1953.	1713.	758.	507.	1715.	1156.
1932	545.	360.	563.	680.	998.	1058.	1694.	1516.	720.	470.	1498.	1041.
1933	522.	343.	508.	623.	935.	915.	1463.	1341.	675.	439.	1313.	940.
1934	492.	323.	454.	575.	867.	810.	1310.	1218.	637.	405.	1167.	862.
1935	470.	309.	406.	533.	821.	733.	1169.	1094.	613.	377.	1050.	783.
1936	453.	297.	369.	499.	795.	700.	1079.	1021.	573.	354.	978.	738.
1937	445.	298.	344.	470.	780.	702.	1021.	988.	571.	343.	942.	712.
1938	449.	299.	324.	457.	767.	772.	972.	999.	596.	334.	938.	727.
1939	435.	295.	300.	433.	766.	832.	941.	911.	579.	320.	967.	695.
1940	468.	318.	305.	442.	803.	892.	989.	1103.	584.	335.	1007.	738.
1941	624.	396.	366.	520.	964.	1088.	1257.	1948.	720.	420.	1454.	977.
1942	648.	492.	466.	647.	1219.	1383.	1610.	1670.	891.	507.	1592.	1131.
1943	700.	545.	521.	730.	1419.	1487.	1724.	1725.	1085.	563.	1673.	1258.
1944	712.	561.	543.	703.	1358.	1560.	1837.	1774.	1038.	581.	1755.	1297.
1945	750.	602.	593.	731.	1415.	1683.	1995.	1845.	1069.	626.	1875.	1320.
1946	748.	617.	613.	720.	1401.	1713.	2060.	1827.	1205.	641.	1902.	1334.
1947	853.	703.	703.	807.	1566.	2036.	2491.	2197.	1196.	729.	2287.	1544.
1948	958.	811.	822.	886.	1752.	2373.	2973.	2615.	1349.	842.	2713.	1786.
1949	1076.	953.	965.	1008.	2034.	2946.	3699.	3203.	1542.	984.	3354.	2142.
1950	1242.	1139.	1165.	1170.	2433.	3904.	4683.	3973.	1850.	1172.	4251.	2643.
1951	1452.	1356.	1405.	1394.	2949.	4819.	5933.	4918.	2099.	1397.	5312.	3241.
1952	1683.	1606.	1655.	1576.	3377.	5451.	6765.	5577.	2225.	1643.	6038.	3676.
1953	1935.	1837.	1906.	1727.	3659.	6064.	7837.	6288.	2392.	1887.	6860.	4097.
1954	2003.	1940.	1992.	1698.	3591.	5945.	8119.	6287.	2306.	1977.	6939.	4106.
1955	2080.	2042.	2097.	1755.	3695.	5989.	8403.	6406.	2399.	2073.	7098.	4236.
1956	2318.	2343.	2395.	1899.	3899.	6101.	8236.	7052.	2488.	2356.	7324.	4395.
1957	2638.	2632.	2677.	2093.	4247.	6553.	9514.	7211.	2667.	2650.	7951.	4771.
1958	2959.	2895.	2950.	2338.	4597.	5864.	8723.	6629.	2976.	2941.	7295.	5205.
1959	3184.	3118.	3233.	2522.	4876.	7394.	11251.	8583.	3077.	3178.	9319.	5565.
1960	3305.	3184.	3332.	2641.	5015.	7795.	12089.	9213.	3072.	3272.	9961.	5839.
1961	3468.	3324.	3444.	2643.	4951.	7954.	12602.	9449.	3089.	3415.	10270.	5939.
1962	3849.	3838.	3912.	2983.	5341.	8730.	13916.	10495.	3326.	3867.	11397.	6494.
1963	4100.	4149.	4251.	3293.	5613.	9387.	15016.	11116.	3301.	4169.	12124.	6937.
1964	4302.	4586.	4684.	3520.	5950.	10200.	16377.	11706.	3423.	4512.	13026.	7426.
1965	5081.	5635.	5672.	4070.	6856.	12148.	19607.	13581.	3843.	5467.	15383.	8675.

CURRENT VALUE OF LIVESTOCK PER FARM OPERATOR 1931-65

-DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1931	518.	507.	696.	742.	1184.	894.	860.	1059.	1143.	572.	933.	918.
1932	403.	414.	557.	581.	873.	695.	684.	796.	876.	461.	723.	703.
1933	438.	405.	525.	524.	936.	706.	700.	853.	861.	454.	751.	714.
1934	435.	359.	483.	532.	965.	663.	695.	893.	846.	418.	748.	708.
1935	512.	368.	486.	587.	1068.	746.	805.	967.	817.	441.	847.	794.
1936	533.	390.	484.	594.	1119.	794.	799.	931.	823.	459.	841.	807.
1937	561.	434.	478.	652.	1118.	865.	725.	931.	837.	474.	824.	816.
1938	557.	400.	432.	620.	1062.	808.	602.	898.	838.	440.	745.	760.
1939	563.	397.	451.	623.	1159.	861.	677.	957.	812.	438.	810.	827.
1940	584.	424.	436.	693.	1220.	939.	763.	1103.	913.	454.	914.	883.
1941	549.	430.	418.	689.	1305.	953.	844.	1232.	997.	445.	960.	937.
1942	867.	615.	567.	948.	1742.	1365.	1219.	1650.	1275.	637.	1307.	1247.
1943	1211.	928.	985.	1569.	2540.	1885.	1749.	2372.	1838.	1001.	1992.	1813.
1944	1152.	936.	960.	1408.	2223.	1825.	1779.	2377.	1674.	985.	1996.	1744.
1945	1102.	932.	925.	1311.	2206.	1662.	1545.	2093.	1566.	972.	1762.	1670.
1946	1082.	974.	910.	1306.	2182.	1466.	1341.	1840.	1421.	969.	1545.	1584.
1947	1054.	1039.	963.	1391.	2268.	1703.	1561.	2158.	1658.	1011.	1804.	1728.
1948	1106.	1083.	1048.	1442.	2492.	1813.	1660.	2387.	1531.	1074.	1993.	1841.
1949	1288.	1111.	1114.	1567.	2725.	2134.	1939.	2717.	1562.	1150.	2263.	2074.
1950.	1412.	1400.	1262.	1664.	3032.	2240.	2184.	3122.	1818.	1348.	2598.	2338.
1951	2062.	1772.	1673.	2230.	4518.	3256.	3204.	4848.	2579.	1799.	3819.	3367.
1952	1820.	2003.	1680.	2269.	3897.	3040.	3207.	4682.	2265.	1834.	3718.	3170.
1953	1571.	1766.	1623.	2064.	3451.	2724.	2843.	4200.	2113.	1664.	3322.	2825.
1954	1482.	1588.	1409.	1744.	3073.	2290.	2450.	3741.	1863.	1486.	2899.	2485.
1955	1531.	1766.	1582.	1777.	3257.	2593.	2832.	4164.	1974.	1637.	3283.	2694.
1956	1541.	1819.	1734.	1919.	3186.	2659.	2897.	4500.	1899.	1714.	3418.	2763.
1957	1580.	1816.	1729.	1972.	3552.	2817.	3414.	5060.	1924.	1721.	3910.	3043.
1958	1900.	2125.	2159.	2470.	4607.	3237.	3912.	5468.	2616.	2088.	4359.	3967.
1959	2095.	2393.	2381.	2641.	4965.	4406.	5203.	7242.	2903.	2375.	5815.	4338.
1960	2068.	2658.	2367.	2678.	4858.	4326.	5094.	6961.	2676.	2384.	5650.	4259.
1961	2202.	2926.	2567.	2718.	5075.	4787.	5903.	7769.	2894.	2585.	6384.	4607.
1962	2325.	3251.	2685.	3034.	5633.	5199.	6392.	8323.	3181.	2771.	6892.	5021.
1963	2443.	3396.	2787.	3193.	5609.	5670.	7021.	8994.	3251.	2890.	7497.	5237.
1964	2534.	3572.	2937.	3101.	5722.	6004.	7515.	9422.	3323.	3022.	7931.	5457.
1965	2982.	4132.	3338.	3471.	6236.	6117.	7790.	9693.	3518.	3485.	8169.	5607.

CURRENT VALUE OF TOTAL ASSETS PER FARM OPERATOR 1931-65

-DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1931	4112.	3854.	4997.	6662.	9749.	8511.	13225.	12660.	10406.	4293.	12019.	9273.
1932	3685.	3532.	4240.	5782.	7819.	7033.	10728.	10251.	8649.	3810.	9771.	7637.
1933	3305.	3249.	3973.	5368.	7625.	6457.	10089.	9155.	8011.	3623.	8995.	7161.
1934	3429.	3183.	3672.	4858.	7711.	6281.	9578.	8770.	7338.	3517.	8565.	6887.
1935	3502.	3165.	3314.	4709.	7284.	5930.	9704.	8257.	6780.	3286.	8413.	6642.
1936	3451.	3333.	3324.	4123.	7247.	5410.	8444.	7820.	6435.	3351.	7586.	6175.
1937	3686.	3043.	2941.	4019.	7197.	5523.	7637.	7458.	6066.	3117.	7124.	5924.
1938	3841.	2668.	2760.	3743.	6673.	5118.	6838.	6795.	6239.	2903.	6455.	5480.
1939	3688.	2609.	2705.	3729.	6708.	5285.	6358.	6786.	5958.	2909.	6264.	5380.
1940	3764.	2584.	2368.	3756.	6869.	5295.	6312.	7237.	5930.	2663.	6465.	5452.
1941	4320.	3200.	2743.	4521.	7629.	6283.	7890.	8934.	7160.	3191.	7838.	6401.
1942	5161.	3945.	3701.	5747.	9203.	7868.	9973.	10281.	8574.	4045.	9625.	7962.
1943	5451.	4526.	4473.	6932.	11442.	8594.	10443.	11197.	10147.	4664.	10303.	9189.
1944	5452.	4955.	4980.	6371.	10495.	8880.	11602.	11637.	9545.	5035.	11024.	9174.
1945	5443.	4927.	4961.	6118.	10031.	8960.	11841.	11560.	9533.	5039.	11117.	8972.
1946	4865.	4799.	4635.	5895.	9520.	9322.	11531.	10983.	10357.	4745.	10856.	8657.
1947	5155.	5270.	5201.	6289.	10217.	10468.	13241.	13046.	9844.	5221.	12564.	9638.
1948	5522.	5659.	5512.	6521.	10907.	12381.	14906.	15350.	10452.	5571.	14507.	10620.
1949	5874.	6021.	5899.	6566.	11681.	13767.	16014.	16711.	11130.	5940.	15769.	11351.
1950	6429.	7021.	7090.	7481.	12929.	15773.	18468.	18653.	12510.	6917.	17937.	12848.
1951	7786.	8208.	8219.	9196.	16866.	19070.	22488.	22569.	14609.	8116.	21757.	15957.
1952	8080.	9186.	8963.	9782.	17443.	20467.	25207.	23778.	14613.	8839.	23641.	16878.
1953	8172.	9457.	9439.	9845.	18380.	22960.	27581.	28485.	15749.	9139.	26879.	18349.
1954	7961.	9462.	9346.	9497.	17929.	20733.	26066.	25876.	15193.	9019.	24789.	17362.
1955	8235.	10216.	10137.	9934.	19742.	22164.	29849.	27959.	16675.	9681.	27387.	18994.
1956	8966.	11286.	11312.	10764.	21108.	23875.	30982.	31803.	17051.	10684.	29655.	20468.
1957	9550.	12035.	11997.	11226.	22946.	24729.	35091.	32065.	18338.	11356.	31556.	21914.
1958	10797.	13296.	13265.	12548.	26527.	23456.	33578.	31619.	21321.	12642.	30493.	25037.
1959	11682.	14460.	14369.	13337.	29544.	29237.	44249.	40880.	23460.	13642.	39467.	27221.
1960	11855.	14946.	14850.	13889.	29784.	31878.	48911.	44405.	23356.	14017.	43187.	28758.
1961	12508.	16061.	15806.	14261.	32011.	33782.	52570.	46641.	23592.	14919.	45848.	30461.
1962	13688.	17548.	16837.	15316.	34918.	36762.	60210.	52082.	25173.	16125.	51477.	33457.
1963	14379.	18534.	17620.	16346.	35875.	40017.	70561.	56927.	24812.	16934.	57897.	36262.
1964	15008.	20385.	19248.	16975.	38706.	44215.	81747.	62313.	25659.	18282.	65010.	39773.
1965	17542.	24712.	23294.	19768.	44702.	53090.	104412.	75124.	29835.	21887.	80306.	47739.

INDEX OF CURRENT VALUE OF FARM CAPITAL PER OPERATOR -(1940=100)

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1931	111.0	149.2	211.0	177.4	141.9	160.7	209.5	174.9	175.5	161.2	187.6	170.1
1932	99.5	136.7	179.1	153.9	113.8	132.8	170.0	141.6	145.8	143.1	152.6	140.1
1933	102.7	125.7	167.8	141.3	111.0	121.9	159.8	126.5	135.1	136.0	140.4	131.4
1934	106.1	123.2	155.1	129.3	112.3	118.6	151.7	121.2	123.7	131.9	133.7	126.2
1935	94.5	122.5	140.0	125.4	106.0	112.0	153.7	114.1	114.3	123.4	131.4	121.8
1936	93.2	129.0	140.4	109.8	105.5	102.2	133.8	108.1	108.5	125.8	118.4	113.5
1937	99.5	117.8	124.2	107.0	104.6	104.3	121.0	103.0	102.3	117.0	111.2	108.7
1938	103.7	103.2	116.6	99.7	97.1	96.6	108.3	93.9	105.2	109.0	100.8	100.5
1939	99.6	108.7	114.3	99.3	97.7	99.8	100.4	93.8	100.5	109.2	97.9	98.7
1940	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1941	116.8	123.8	115.8	120.4	111.1	118.7	125.0	123.4	120.7	119.8	123.3	119.1
1942	139.3	152.7	156.3	153.0	134.0	148.6	158.0	142.1	144.6	151.9	150.3	146.1
1943	147.1	175.2	188.9	184.6	160.6	162.3	165.4	154.7	171.1	175.2	160.9	168.6
1944	147.2	191.7	210.3	169.6	152.8	167.7	183.8	160.8	161.0	189.8	172.1	167.0
1945	147.0	190.7	209.6	162.9	146.0	169.2	187.6	159.7	160.8	189.2	173.6	166.6
1946	131.3	185.7	195.8	156.9	138.6	176.1	182.7	151.8	174.6	178.2	169.5	158.8
1947	139.2	204.2	219.7	167.4	148.7	197.7	209.8	180.3	166.0	196.1	196.2	178.2
1948	149.1	219.0	232.8	173.6	158.8	233.9	236.2	212.1	176.2	209.2	226.5	194.8
1949	158.6	233.0	249.1	174.8	170.0	260.0	253.7	230.9	187.7	223.1	246.2	208.2
1950	173.5	271.7	299.5	199.2	188.2	297.9	292.6	257.7	211.0	259.7	280.1	235.7
1951	210.2	317.6	347.2	244.8	245.5	360.2	356.3	311.9	246.3	304.8	339.7	290.9
1952	218.1	355.5	378.6	260.4	253.9	386.5	399.3	328.6	246.4	331.9	369.1	307.6
1953	220.6	366.0	398.7	262.1	267.6	433.6	437.0	393.6	265.6	343.2	410.7	329.6
1954	212.2	386.2	394.7	252.8	261.0	391.6	413.0	357.5	256.2	338.7	387.0	318.8
1955	222.3	395.3	428.2	264.5	287.4	418.6	472.9	386.3	281.2	363.5	427.6	348.4
1956	242.0	436.7	477.8	286.6	307.3	450.9	490.8	439.4	287.5	401.2	463.0	375.4
1957	257.8	465.7	506.7	298.9	334.0	467.0	555.9	443.1	309.2	426.5	498.7	403.7
1958	291.4	514.5	560.3	334.1	386.2	443.0	532.0	436.9	359.5	474.8	476.1	459.3
1959	315.4	559.6	600.9	355.1	430.1	552.2	701.0	564.9	395.6	512.3	616.2	503.6
1960	320.0	578.4	627.2	369.8	433.6	602.0	774.9	613.6	393.8	526.4	674.3	527.4
1961	337.7	621.5	667.6	379.7	466.0	638.0	832.8	644.5	397.8	560.2	715.8	559.8
1962	369.5	679.1	711.1	407.8	508.3	694.3	953.9	719.6	424.5	605.5	803.7	613.7
1963	388.2	717.3	744.2	435.2	522.3	755.7	1117.9	786.6	418.4	635.9	904.0	665.2
1964	405.1	788.9	813.0	451.9	563.5	835.0	1295.1	861.0	432.7	686.5	1015.0	729.6
1965	473.5	956.3	983.9	526.3	650.8	1002.6	1654.2	1036.0	503.1	821.9	1253.8	875.7

INDEX OF CURRENT VALUE OF FARM CAPITAL PER OPERATOR -(CANADA=100)

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR
1931	44.3	41.6	53.9	71.8	105.1	91.8	142.6	136.5	112.2	46.3	129.6
1932	48.3	46.2	55.5	75.7	102.4	92.1	140.5	134.2	113.2	49.9	127.9
1933	53.1	45.4	55.5	74.1	106.5	90.2	140.9	127.8	111.9	50.6	125.6
1934	57.1	46.2	53.4	70.6	112.0	91.3	139.2	127.4	106.6	51.0	124.4
1935	52.7	47.7	49.9	70.9	109.7	89.3	146.1	124.3	102.1	49.5	126.7
1936	55.9	54.0	53.8	66.8	117.4	87.6	136.7	126.6	104.2	54.3	122.8
1937	62.2	51.4	49.6	67.8	121.5	93.2	128.9	125.9	107.4	52.6	120.3
1938	70.1	48.7	50.4	68.3	121.8	93.4	124.8	124.0	113.9	53.0	117.8
1939	64.6	52.2	50.3	69.3	124.7	98.2	117.8	126.2	110.7	54.0	116.4
1940	66.0	47.4	43.4	68.9	126.0	97.1	115.8	132.8	108.8	48.8	117.5
1941	66.7	49.3	42.3	69.7	117.5	96.8	121.5	137.6	110.3	49.2	121.7
1942	64.8	49.0	46.5	72.2	115.6	98.8	125.3	129.1	107.7	50.8	120.9
1943	59.3	49.3	48.7	75.4	124.5	93.5	113.6	121.9	110.4	50.8	112.1
1944	59.9	54.4	54.7	70.0	115.3	97.5	127.4	127.8	104.9	55.5	121.1
1945	60.7	54.9	55.3	68.2	111.8	99.9	132.0	128.9	106.3	56.2	123.9
1946	56.2	55.4	53.5	68.1	110.0	107.7	133.2	126.9	119.6	54.8	125.4
1947	53.7	54.9	54.1	65.4	106.3	108.9	137.8	135.8	102.4	54.3	130.8
1948	52.0	53.3	51.9	61.4	102.7	116.6	140.4	144.5	98.4	52.5	136.6
1949	51.7	53.0	52.0	57.8	102.9	121.3	141.1	147.2	98.1	52.3	138.3
1950	50.0	54.7	55.2	58.2	100.6	122.8	143.7	145.2	97.4	53.8	139.6
1951	49.1	51.8	51.8	58.0	106.4	120.3	141.8	142.3	92.1	51.2	137.2
1952	47.9	54.4	53.1	58.0	103.3	121.3	149.3	140.9	86.6	52.4	140.1
1953	44.5	51.5	51.4	53.7	100.2	129.1	150.3	155.2	85.8	49.8	146.5
1954	45.2	54.4	53.8	54.6	103.1	119.3	150.0	148.9	87.4	51.9	142.6
1955	43.4	55.8	53.4	52.3	103.9	116.7	157.2	147.2	87.8	51.0	144.2
1956	43.8	55.2	55.3	52.6	103.2	116.7	151.4	155.4	83.3	52.2	144.9
1957	43.8	55.2	55.0	51.5	105.2	113.4	160.9	147.0	84.1	52.1	144.6
1958	43.1	53.1	53.0	50.1	106.0	93.7	134.1	126.3	85.2	50.5	121.9
1959	42.8	53.0	52.7	48.9	108.3	107.1	162.1	149.8	86.0	50.0	144.6
1960	41.2	52.0	51.6	46.3	103.6	110.9	170.1	154.4	81.2	48.8	150.2
1961	41.1	52.7	51.9	46.8	105.1	110.9	172.6	153.1	77.4	49.0	150.5
1962	40.9	52.4	50.3	45.8	104.4	109.9	180.0	155.7	75.2	48.2	153.9
1963	39.7	51.1	48.6	45.1	98.9	110.4	194.6	157.0	68.4	46.7	156.7
1964	37.7	51.3	48.4	42.7	97.3	111.2	205.5	156.7	64.5	46.0	163.5
1965	36.7	51.8	48.8	41.4	93.6	111.2	218.7	157.4	62.5	45.8	168.2

DEFLATED VALUE OF LAND PER FARM OPERATOR 1931-65

-DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1931	1653.	1589.	1976.	3404.	4442.	4710.	6768.	6681.	5050.	1732.	6302.	4601.
1932	1663.	1570.	1853.	3279.	4321.	4388.	6481.	6310.	4761.	1698.	5971.	4405.
1933	1696.	1573.	1776.	3160.	4236.	4017.	6154.	5873.	4503.	1671.	5598.	4218.
1934	1700.	1551.	1681.	3070.	4104.	3756.	5910.	5613.	4271.	1630.	5324.	4050.
1935	1494.	1230.	1345.	2256.	3564.	3471.	5797.	5218.	4023.	1325.	5104.	3586.
1936	1459.	1156.	1222.	2044.	3305.	3241.	5494.	4933.	3654.	1238.	4825.	3360.
1937	1440.	1100.	1124.	1845.	3143.	3085.	4903.	4635.	3487.	1170.	4424.	3111.
1938	1431.	1031.	1021.	1687.	2937.	2937.	4358.	4351.	3469.	1094.	4051.	2884.
1939	1394.	970.	932.	1529.	2838.	2811.	3887.	4082.	3281.	1023.	3723.	2675.
1940	1495.	990.	926.	1489.	2875.	2884.	3736.	4155.	3296.	1040.	3696.	2696.
1941	1647.	1137.	1047.	1642.	3239.	3313.	5259.	4833.	3881.	1183.	4699.	3211.
1942	1746.	1276.	1186.	1870.	3527.	3728.	6007.	5441.	4398.	1316.	5325.	3602.
1943	1686.	1290.	1196.	1973.	3618.	3561.	5817.	5180.	4932.	1319.	5111.	3631.
1944	1544.	1246.	1156.	1812.	3215.	3523.	5840.	5114.	4494.	1262.	5006.	3427.
1945	1448.	1222.	1142.	1761.	3024.	3392.	5691.	4898.	4310.	1231.	4914.	3298.
1946	1265.	1113.	1050.	1598.	2663.	3030.	5223.	4406.	4382.	1117.	4457.	2971.
1947	1181.	1100.	1047.	1661.	2642.	3075.	5325.	4379.	3859.	1095.	4496.	2966.
1948	1124.	1103.	1070.	1553.	2593.	2973.	5193.	4186.	3813.	1094.	4344.	2890.
1949	1076.	1142.	1087.	1543.	2569.	2962.	5228.	4067.	3756.	1106.	4315.	2873.
1950	1119.	1255.	1290.	1637.	2658.	3076.	5661.	4139.	4033.	1239.	4533.	3027.
1951	1192.	1391.	1406.	1821.	2977.	3310.	5871.	4353.	4366.	1351.	4743.	3254.
1952	1255.	1542.	1562.	1894.	3121.	3531.	6476.	4566.	4419.	1482.	5115.	3446.
1953	1244.	1646.	1538.	1850.	3215.	3641.	6906.	5275.	4562.	1507.	5563.	3634.
1954	1181.	1640.	1600.	1705.	3088.	3471.	6517.	4879.	4296.	1511.	5213.	3432.
1955	1206.	1685.	1670.	1747.	3271.	3667.	7287.	5192.	4519.	1557.	5670.	3664.
1956	1249.	1751.	1776.	1771.	3423.	3881.	7487.	5865.	4520.	1628.	6082.	3864.
1957	1262.	1834.	1830.	1786.	3531.	4194.	8313.	5701.	4598.	1679.	6366.	3997.
1958	1296.	1816.	1854.	1827.	3737.	3589.	7573.	5220.	4984.	1694.	5746.	4251.
1959	1336.	1755.	1896.	1866.	3942.	4449.	9723.	6556.	5154.	1687.	7269.	4485.
1960	1351.	1853.	2014.	1895.	4002.	4654.	10484.	6945.	5035.	1765.	7739.	4643.
1961	1421.	1888.	2025.	1908.	4137.	4773.	10951.	7095.	4960.	1798.	7984.	4771.
1962	1498.	2070.	2216.	2014.	4321.	5085.	11865.	7577.	5144.	1948.	8567.	5039.
1963	1541.	2174.	2329.	2071.	4361.	5181.	12283.	7674.	4960.	2033.	8760.	5160.
1964	1564.	2321.	2452.	2092.	4400.	5199.	12512.	7675.	4959.	2125.	8825.	5191.
1965	1762.	2825.	3014.	2423.	4924.	6094.	15018.	8983.	5759.	2543.	10443.	6041.

TABLE DII

DEFLATED VALUE OF BUILDINGS PER FARM OPERATOR 1931-65

-DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	YUK.	NB.	CANADA
1931	1517.	1731.	2001.	2107.	3356.	1660.	2092.	1741.	2460.	1773.	1852.	2303.
1932	1491.	1728.	1838.	1951.	2872.	1437.	1791.	1546.	2254.	1715.	1634.	2048.
1933	1437.	1442.	1603.	1653.	2567.	1244.	1578.	1281.	1961.	1498.	1400.	1779.
1934	1447.	1365.	1419.	1377.	2515.	1202.	1448.	1196.	1727.	1401.	1308.	1446.
1935	1301.	1468.	1351.	1530.	2441.	1124.	1465.	1124.	1602.	1400.	1279.	1647.
1936	1143.	1419.	1238.	1168.	2159.	840.	1102.	961.	1361.	1297.	1010.	1370.
1937	1117.	1115.	953.	1009.	1920.	801.	909.	831.	1132.	1050.	860.	1180.
1938	1309.	1049.	996.	1032.	1933.	784.	918.	827.	1294.	1071.	859.	1199.
1939	1138.	1034.	899.	955.	1742.	723.	771.	775.	1135.	994.	762.	1077.
1940	1052.	841.	692.	882.	1645.	647.	711.	755.	1028.	809.	712.	993.
1941	1154.	994.	773.	1023.	1657.	726.	689.	720.	1166.	927.	767.	1047.
1942	1149.	1022.	966.	1105.	1663.	792.	768.	800.	1207.	994.	784.	1108.
1943	1067.	1053.	965.	1180.	1912.	805.	749.	827.	1325.	1018.	728.	1181.
1944	980.	1078.	1022.	982.	1804.	781.	790.	813.	1129.	1037.	796.	1072.
1945	960.	1051.	1006.	936.	1482.	811.	837.	853.	1139.	1016.	837.	1047.
1946	825.	999.	913.	896.	1398.	960.	862.	875.	1330.	929.	808.	1030.
1947	869.	1056.	988.	923.	1423.	980.	920.	982.	1212.	990.	955.	1077.
1948	813.	977.	879.	838.	1272.	961.	839.	955.	1053.	905.	907.	980.
1949	817.	984.	895.	788.	1278.	963.	802.	943.	1068.	913.	889.	971.
1950	836.	1057.	963.	870.	1312.	918.	772.	893.	1024.	970.	849.	949.
1951	798.	1007.	911.	856.	1291.	862.	731.	838.	956.	922.	800.	956.
1952	829.	1079.	971.	907.	1375.	916.	817.	891.	950.	978.	868.	1020.
1953	860.	1105.	1018.	949.	1534.	1056.	911.	1127.	1059.	1019.	1031.	1139.
1954	833.	1133.	1027.	963.	1554.	984.	861.	994.	1069.	1018.	939.	1117.
1955	864.	1231.	1109.	1039.	1782.	1083.	1091.	1112.	1214.	1097.	1081.	1260.
1956	971.	1239.	1203.	1110.	1918.	1210.	1129.	1306.	1257.	1191.	1211.	1371.
1957	1014.	1409.	1249.	1144.	2051.	1221.	1270.	1282.	1372.	1244.	1263.	1449.
1958	1159.	1557.	1353.	1266.	2303.	1159.	1238.	1305.	1616.	1377.	1246.	1666.
1959	1241.	1635.	1442.	1328.	2701.	1283.	1033.	1645.	1764.	1494.	1580.	1817.
1960	1267.	1716.	1520.	1404.	2745.	1367.	1828.	1818.	1743.	1516.	1757.	1914.
1961	1338.	1856.	1634.	1484.	3048.	1663.	1994.	1925.	1770.	1624.	1889.	2066.
1962	1405.	1965.	1696.	1519.	3291.	1795.	2323.	2164.	1866.	1719.	2136.	2242.
1963	1492.	2017.	1713.	1574.	3311.	1914.	2756.	2337.	1781.	1749.	2389.	2352.
1964	1482.	2111.	1777.	1553.	3413.	1998.	3051.	2429.	1713.	1789.	2549.	2424.
1965	1625.	2471.	2062.	1757.	3822.	2402.	3933.	2960.	1972.	2062.	3173.	2845.

DEFLATED VALUE OF MACHINERY PER FARM OPERATOR 1931-65

-DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	NAR.	PR.	CANADA
1931	605.	402.	668.	780.	1124.	1280.	2056.	1803.	798.	536.	1805.	1219.
1932	582.	384.	601.	726.	1066.	1122.	1797.	1668.	764.	502.	1589.	1107.
1933	569.	374.	554.	680.	1019.	992.	1607.	1453.	732.	479.	1423.	1022.
1934	524.	344.	483.	613.	923.	853.	1380.	1283.	671.	431.	1229.	903.
1935	492.	323.	425.	558.	860.	768.	1224.	1145.	642.	394.	1099.	820.
1936	461.	302.	375.	507.	809.	717.	1106.	1046.	587.	360.	1002.	753.
1937	456.	305.	353.	481.	799.	724.	1053.	1018.	588.	351.	971.	732.
1938	427.	284.	308.	435.	729.	744.	937.	963.	575.	318.	905.	678.
1939	417.	283.	288.	415.	734.	805.	911.	882.	560.	307.	879.	660.
1940	440.	298.	286.	415.	754.	845.	938.	1046.	553.	318.	954.	694.
1941	509.	361.	333.	474.	879.	1000.	1155.	1790.	662.	383.	1336.	895.
1942	563.	427.	405.	562.	1059.	1212.	1411.	1464.	781.	440.	1386.	987.
1943	609.	466.	446.	624.	1213.	1270.	1472.	1473.	926.	481.	1429.	1075.
1944	605.	477.	461.	597.	1154.	1317.	1552.	1498.	876.	493.	1483.	1065.
1945	653.	525.	516.	637.	1233.	1461.	1732.	1602.	928.	545.	1628.	1155.
1946	630.	520.	516.	607.	1180.	1442.	1734.	1538.	1014.	540.	1601.	1123.
1947	661.	558.	558.	640.	1238.	1610.	1970.	1738.	946.	579.	1809.	1223.
1948	665.	575.	583.	628.	1243.	1674.	2097.	1844.	951.	597.	1913.	1263.
1949	682.	604.	611.	639.	1288.	1860.	2335.	2022.	974.	623.	2117.	1354.
1950	759.	696.	712.	715.	1467.	2357.	2828.	2399.	1117.	717.	2567.	1604.
1951	784.	732.	758.	753.	1592.	2572.	3166.	2624.	1120.	754.	2835.	1737.
1952	871.	831.	857.	816.	1748.	2778.	3448.	2843.	1134.	850.	3077.	1835.
1953	997.	946.	982.	890.	1885.	3067.	3964.	3181.	1210.	972.	3470.	2037.
1954	1029.	1001.	1025.	873.	1847.	2984.	4076.	3156.	1158.	1017.	3483.	2040.
1955	1061.	1042.	1070.	895.	1885.	2996.	4204.	3205.	1200.	1057.	3551.	2119.
1956	1113.	1125.	1151.	912.	1873.	2907.	3924.	3360.	1185.	1132.	3439.	2100.
1957	1175.	1172.	1192.	932.	1891.	2932.	4257.	3226.	1193.	1180.	3557.	2131.
1958	1237.	1212.	1235.	978.	1924.	2486.	3698.	2810.	1262.	1231.	3075.	2196.
1959	1263.	1287.	1283.	1001.	1935.	2993.	4555.	3475.	1246.	1261.	3773.	2235.
1960	1284.	1246.	1294.	1026.	1948.	3083.	4782.	3644.	1215.	1271.	3940.	2293.
1961	1314.	1252.	1297.	995.	1865.	3061.	4851.	3637.	1189.	1286.	3953.	2267.
1962	1412.	1408.	1435.	1094.	1959.	3266.	5206.	3926.	1244.	1419.	4241.	2412.
1963	1469.	1507.	1544.	1196.	2039.	3451.	5520.	4087.	1214.	1514.	4457.	2539.
1964	1528.	1629.	1646.	1251.	2114.	3657.	5872.	4197.	1228.	1603.	4670.	2653.
1965	1773.	1966.	1979.	1420.	2392.	4274.	6899.	4779.	1352.	1908.	5413.	3043.

DEFLATED VALUE OF LIVESTOCK PER FARM OPERATOR 1931-65

-DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PB.	CANADA
1931	558.	543.	746.	795.	1269.	977.	940.	1158.	1249.	615.	1019.	932.
1932	580.	581.	782.	816.	1226.	1005.	989.	1150.	1266.	647.	1045.	999.
1933	625.	577.	749.	747.	1336.	1045.	1037.	1264.	1276.	648.	1113.	1035.
1934	495.	405.	550.	606.	1031.	791.	830.	1065.	1009.	476.	894.	817.
1935	542.	390.	514.	621.	1130.	800.	867.	1037.	877.	466.	908.	845.
1936	569.	413.	512.	629.	1186.	861.	866.	1010.	892.	480.	912.	863.
1937	530.	410.	452.	617.	1056.	814.	682.	876.	758.	446.	775.	770.
1938	532.	382.	413.	593.	1014.	769.	573.	854.	798.	420.	708.	724.
1939	559.	394.	428.	619.	1152.	834.	656.	928.	787.	436.	785.	793.
1940	552.	401.	413.	655.	1153.	864.	702.	1016.	841.	429.	842.	825.
1941	446.	349.	339.	580.	1061.	749.	664.	969.	784.	362.	785.	751.
1942	611.	434.	400.	668.	1228.	909.	812.	1099.	849.	449.	930.	885.
1943	770.	590.	620.	997.	1615.	1103.	1023.	1388.	1075.	637.	1166.	1173.
1944	715.	581.	596.	874.	1380.	1035.	1009.	1348.	950.	611.	1132.	1070.
1945	704.	564.	560.	794.	1336.	920.	855.	1158.	867.	589.	975.	977.
1946	613.	551.	515.	739.	1235.	769.	704.	966.	851.	548.	811.	870.
1947	542.	534.	495.	716.	1167.	802.	735.	1017.	687.	520.	850.	858.
1948	438.	427.	413.	569.	983.	638.	584.	840.	539.	423.	687.	701.
1949	510.	440.	441.	620.	1078.	733.	666.	933.	537.	455.	777.	774.
1950	536.	531.	479.	631.	1150.	705.	688.	983.	573.	511.	799.	810.
1951	554.	562.	531.	708.	1434.	854.	841.	1272.	677.	571.	1002.	936.
1952	693.	765.	640.	864.	1484.	980.	1042.	1522.	736.	698.	1208.	1126.
1953	615.	691.	636.	785.	1351.	970.	1012.	1495.	752.	652.	1183.	1060.
1954	583.	643.	570.	706.	1243.	834.	892.	1362.	678.	601.	1055.	960.
1955	650.	750.	672.	754.	1383.	981.	1071.	1575.	747.	695.	1242.	1085.
1956	649.	766.	730.	808.	1341.	1000.	1090.	1692.	714.	722.	1286.	1104.
1957	638.	734.	658.	797.	1435.	1010.	1224.	1814.	690.	695.	1401.	1162.
1958	728.	814.	828.	947.	1766.	1071.	1295.	1810.	866.	798.	1443.	1418.
1959	815.	1008.	925.	1026.	1906.	1465.	1730.	2408.	965.	923.	1983.	1564.
1960	822.	1057.	941.	1065.	1932.	1494.	1759.	2404.	924.	948.	1951.	1554.
1961	858.	1138.	998.	1057.	1973.	1617.	1994.	2624.	978.	1005.	2156.	1671.
1962	866.	1211.	1000.	1130.	2098.	1616.	1987.	2587.	989.	1032.	2139.	1715.
1963	941.	1306.	1074.	1230.	2161.	1844.	2283.	2925.	1057.	1113.	2436.	1872.
1964	999.	1408.	1158.	1222.	2256.	2036.	2548.	3195.	1127.	1191.	2689.	1992.
1965	1091.	1511.	1221.	1270.	2281.	1902.	2422.	3013.	1094.	1275.	2539.	1960.

DEFLATED VALUE OF TOTAL ASSETS PER FARM OPERATOR 1931-65

-DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	P.R.	CANADA
1931	4830.	4265.	5391.	7086.	10191.	8567.	11835.	11382.	9557.	4655.	10979.	9115.
1932	4301.	4264.	5074.	6772.	9464.	7951.	11057.	10614.	9045.	4552.	10239.	8559.
1933	4327.	3966.	4682.	6219.	9158.	7298.	10375.	9872.	8471.	4296.	9542.	8050.
1934	4172.	3666.	4133.	5666.	8572.	6603.	9568.	9158.	7679.	3939.	8755.	7416.
1935	3829.	3431.	3635.	4966.	7924.	6164.	9352.	8524.	7143.	3585.	8391.	6879.
1936	3626.	3291.	3347.	4348.	7458.	5709.	8568.	7950.	6494.	3375.	7749.	6346.
1937	3543.	2950.	2881.	3951.	8019.	5424.	7547.	7361.	5994.	3020.	7029.	5792.
1938	3699.	2746.	2738.	3747.	6613.	5234.	6786.	6996.	6135.	2903.	6524.	5489.
1939	3508.	2681.	2549.	3518.	6466.	5173.	6225.	6666.	5767.	2759.	6148.	5278.
1940	3536.	2531.	2317.	3441.	6427.	5241.	6086.	6971.	5719.	2593.	6202.	5179.
1941	3816.	2841.	2493.	3699.	6636.	5788.	7767.	8311.	6495.	2854.	7327.	5933.
1942	4089.	3159.	2897.	4204.	7476.	6641.	8998.	8803.	7235.	3200.	8425.	6563.
1943	4128.	3398.	3233.	4775.	8357.	6740.	9062.	8867.	8299.	3455.	8494.	7040.
1944	3844.	3382.	3235.	4266.	7353.	6656.	9191.	8774.	7450.	3404.	8497.	6634.
1945	3765.	3362.	3226.	4128.	7076.	6584.	9116.	8512.	7244.	3381.	8355.	6477.
1946	3853.	3183.	2993.	3841.	6476.	6282.	8523.	7784.	7577.	3134.	7756.	5976.
1947	3253.	3248.	3089.	3881.	6470.	6467.	8951.	8116.	6764.	3184.	8110.	6124.
1948	3041.	3083.	2946.	3587.	6090.	6245.	8713.	7825.	6356.	3019.	7852.	5846.
1949	3095.	3169.	3033.	3591.	6213.	6518.	9032.	7985.	6335.	3097.	8098.	5971.
1950	3250.	3539.	3444.	3853.	6607.	7057.	9949.	8414.	6766.	3437.	8748.	6430.
1951	3428.	3693.	3607.	4137.	7294.	7598.	10609.	9088.	7119.	3599.	9380.	6933.
1952	3648.	4215.	4030.	4441.	7728.	8213.	11783.	9821.	7239.	4010.	10269.	7477.
1953	3716.	4389.	4174.	4473.	7985.	8763.	12794.	11077.	7583.	4144.	11247.	7990.
1954	3630.	4417.	4221.	4247.	7734.	8273.	12346.	10392.	7200.	4146.	10691.	7939.
1955	3804.	4707.	4521.	4431.	8321.	8727.	13613.	11085.	7681.	4406.	11545.	8128.
1956	3983.	4981.	4859.	4601.	8554.	8997.	13650.	12223.	7676.	4672.	12067.	8440.
1957	4089.	5148.	4969.	4658.	8907.	9356.	15064.	12022.	7853.	4798.	12588.	8734.
1958	4421.	5399.	5270.	5017.	9811.	8305.	13803.	11144.	8727.	5100.	11510.	9531.
1959	4653.	5635.	5547.	5221.	10484.	10290.	17641.	14083.	9120.	5525.	14554.	10031.
1960	4724.	5862.	5770.	5389.	10627.	10768.	18553.	14810.	8917.	5500.	15387.	10434.
1961	4929.	6134.	5955.	5424.	11018.	11115.	19789.	15280.	8897.	5714.	15983.	10775.
1962	5241.	6653.	6349.	5757.	11669.	11763.	21381.	16254.	9243.	6117.	17084.	11437.
1963	5464.	7007.	6680.	6071.	11871.	12391.	22843.	17023.	9012.	6410.	18045.	11902.
1964	5555.	7469.	7032.	6118.	12182.	12887.	23984.	17495.	9027.	6708.	18734.	12263.
1965	6251.	8773.	8296.	6870.	13419.	14673.	28272.	19734.	10177.	7787.	21568.	13877.

TABLE LVI

INDEX OF DEFLATED VALUE OF FARM CAPITAL PER OPERATOR - (1940=100)

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1931	122.4	168.5	232.8	205.9	158.6	163.5	194.5	163.3	167.1	179.5	177.0	176.0
1932	121.6	168.5	219.0	196.8	147.6	151.7	181.7	152.2	158.2	175.5	165.1	165.3
1933	122.3	156.7	202.0	180.7	142.5	139.3	170.5	141.6	148.1	165.7	153.9	155.4
1934	117.9	144.9	178.4	164.7	133.4	126.0	157.2	131.4	134.3	151.9	141.7	143.2
1935	108.2	135.6	156.9	144.3	123.5	117.6	153.7	122.3	124.9	138.3	135.3	133.2
1936	102.5	130.0	144.4	126.3	116.1	108.9	140.8	114.0	113.5	130.1	124.9	122.5
1937	100.1	115.8	124.4	114.6	107.7	103.5	124.0	105.6	104.8	116.5	113.3	111.8
1938	104.5	108.5	118.2	108.9	102.9	99.9	111.5	100.4	107.3	111.9	105.2	106.0
1939	99.1	105.9	110.0	102.2	100.6	98.7	102.3	95.6	100.8	106.4	99.1	100.5
1940	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1941	107.8	112.3	107.6	107.5	106.4	110.4	127.6	119.2	113.6	110.1	121.4	114.0
1942	115.0	124.8	125.0	122.2	116.4	126.7	147.8	126.3	126.5	123.4	135.8	127.1
1943	116.7	134.3	139.5	138.8	130.0	128.6	148.9	127.2	144.4	133.2	136.9	136.3
1944	108.6	133.6	139.6	124.0	114.4	127.0	151.0	125.9	130.3	131.2	137.0	128.1
1945	106.4	132.9	139.2	120.0	110.1	125.6	149.8	122.1	126.7	130.4	134.7	125.1
1946	94.2	125.8	129.2	111.6	100.8	118.3	140.0	111.7	132.5	120.9	125.1	115.8
1947	91.9	128.3	133.3	112.8	100.7	123.4	147.1	116.4	117.2	122.8	130.8	118.2
1948	85.9	121.8	127.1	104.2	94.8	119.2	143.2	112.2	111.1	116.4	126.6	112.8
1949	87.2	125.2	130.9	104.3	96.7	124.4	148.4	114.5	110.8	119.4	130.6	115.3
1950	91.8	139.9	148.6	112.0	102.8	134.7	163.5	120.7	118.3	132.5	141.0	124.2
1951	96.9	145.9	155.7	120.2	113.5	145.0	174.3	130.4	124.5	138.8	151.2	133.9
1952	103.1	166.6	173.9	129.0	120.2	156.7	193.6	140.9	126.6	154.6	165.6	144.4
1953	105.0	173.4	180.1	130.0	124.2	167.2	210.2	158.9	132.6	159.8	181.3	152.9
1954	102.6	174.5	182.2	123.4	120.3	157.8	202.8	149.1	125.9	159.9	172.4	146.5
1955	107.5	186.0	195.1	128.8	129.5	166.5	223.7	159.0	134.3	169.9	186.1	157.0
1956	112.6	196.8	209.7	133.7	133.1	171.7	223.9	175.3	134.2	180.2	194.6	163.0
1957	115.6	203.4	214.5	135.4	138.6	178.5	247.5	172.5	137.3	185.0	203.0	166.7
1958	124.9	213.4	227.4	145.8	152.7	158.5	226.8	159.9	152.6	196.7	185.6	164.0
1959	131.5	222.7	239.4	151.7	163.1	196.3	289.8	202.0	159.6	205.4	234.7	194.7
1960	133.5	231.7	249.0	156.6	165.3	205.5	309.8	212.4	155.9	212.1	248.1	201.5
1961	139.3	242.4	257.0	157.6	171.4	212.1	325.1	219.2	155.6	220.3	257.7	208.1
1962	148.1	262.9	274.0	167.3	181.6	224.4	351.3	233.2	161.6	235.9	275.5	221.3
1963	154.4	276.9	287.4	176.4	184.7	236.4	375.3	244.2	157.6	247.2	290.9	229.8
1964	156.9	295.1	303.5	177.8	189.6	245.9	394.1	250.9	157.8	258.7	302.1	236.8
1965	176.7	346.7	358.0	199.6	206.8	280.0	464.5	283.1	177.9	300.3	347.7	268.0

TABLE LVII

INDEX OF DEFLATED VALUE OF FARM CAPITAL PER OPERATOR -(CANADA=100)

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR
1931	47.5	46.8	59.1	77.7	111.8	94.0	129.8	124.9	104.8	51.1	120.4
1932	50.3	49.5	59.3	79.1	110.8	92.9	129.2	124.0	105.7	53.2	119.6
1933	53.8	49.3	58.2	77.3	113.8	90.7	128.9	122.6	105.2	53.4	118.5
1934	56.3	49.4	55.7	76.4	115.6	89.0	129.0	123.5	103.5	53.1	118.1
1935	55.5	49.7	52.7	72.0	115.0	89.3	135.6	123.6	103.5	52.0	121.6
1936	57.1	51.9	52.7	68.5	117.5	90.0	135.0	125.3	102.3	53.2	122.1
1937	61.2	50.6	49.7	68.2	119.4	93.6	130.3	127.1	103.5	52.1	121.4
1938	67.4	50.0	49.9	68.3	120.5	95.4	123.6	127.5	111.8	52.9	118.9
1939	67.4	51.5	49.0	67.8	124.2	99.4	119.6	128.1	110.8	53.0	118.1
1940	68.3	48.9	44.7	66.4	124.1	101.2	117.5	134.6	110.4	50.1	119.8
1941	64.6	48.1	42.2	62.7	115.8	98.1	131.6	140.8	110.0	48.4	127.5
1942	61.8	48.0	44.0	63.9	113.6	100.9	136.7	133.7	109.9	48.6	128.0
1943	58.5	48.1	45.8	67.6	118.4	95.5	128.3	125.6	117.0	48.9	120.3
1944	57.9	51.0	48.8	64.3	110.8	100.3	138.5	132.3	112.3	51.3	128.1
1945	58.1	51.9	49.8	63.7	109.2	101.6	140.7	131.4	111.8	52.2	129.0
1946	55.6	53.1	49.9	64.1	108.0	103.5	142.2	129.9	126.4	52.3	129.4
1947	53.1	53.0	50.4	63.4	105.7	105.6	146.2	132.5	109.5	52.0	132.4
1948	52.1	52.8	50.4	61.4	104.3	106.9	149.2	134.0	108.8	51.7	134.4
1949	51.7	53.1	50.8	60.1	104.1	109.2	151.3	133.7	106.1	51.9	135.6
1950	50.5	55.0	53.6	59.9	102.8	109.8	154.7	130.9	105.2	53.5	136.1
1951	49.5	53.3	52.0	59.7	105.2	109.6	153.0	131.1	102.7	51.9	135.3
1952	48.8	56.4	53.9	59.4	103.4	109.8	157.6	131.4	96.8	53.6	137.3
1953	46.9	55.4	52.7	56.5	100.8	110.6	161.5	139.9	95.7	52.3	142.0
1954	47.8	58.2	55.6	56.0	101.9	109.0	162.7	136.9	94.9	54.6	140.9
1955	46.8	57.9	55.6	54.5	102.4	107.4	167.5	136.4	94.5	54.2	142.0
1956	47.2	59.0	57.6	54.5	101.4	106.6	161.5	144.8	91.0	55.4	143.0
1957	46.8	58.9	56.9	53.3	102.0	107.1	172.5	137.6	89.9	54.9	144.1
1958	46.4	56.6	55.3	52.6	102.9	87.1	144.8	116.9	91.6	53.5	120.8
1959	46.2	55.9	56.0	51.8	104.0	102.1	175.0	139.7	90.5	52.8	144.4
1960	45.3	56.2	55.3	51.6	101.8	103.2	180.7	141.9	85.5	52.7	147.5
1961	45.7	56.9	55.3	50.3	102.3	103.2	183.7	141.8	82.6	53.0	148.3
1962	45.9	58.3	55.7	50.5	102.3	103.1	187.4	142.5	81.0	53.6	149.3
1963	45.9	58.9	56.0	51.0	99.7	104.1	191.9	143.0	75.7	53.9	151.6
1964	45.3	60.9	57.3	49.9	99.3	105.1	195.6	142.7	73.6	54.7	152.8
1965	45.0	63.2	59.8	49.5	98.7	105.7	203.7	142.2	73.3	56.1	155.4

QUANTITY COMPONENT A -AGGREGATE-

-THOUSANDS OF DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	P.R.	CANADA
1926	5450.	2735.	4822.	-4862.	27946.	47094.	-1737.	8158.	-4991.	13007.	63514.	84614.
1927	-1706.	3165.	-3248.	24822.	14802.	3170.	-30905.	4256.	1257.	-1791.	-23480.	15611.
1928	50.	-3570.	-6974.	986.	9596.	11314.	69975.	12747.	1148.	-10494.	94035.	95271.
1929	4017.	-3669.	-12167.	6387.	-35854.	-59266.	128891.	219222.	19964.	-11818.	288647.	267525.
1930	1754.	5555.	8125.	36269.	68744.	4063.	23948.	20851.	4524.	15483.	48862.	173833.
1931	51.	4217.	2350.	12528.	-37816.	-8568.	-14709.	-14832.	307.	6618.	-38110.	-56472.
1932	-114.	-4597.	-1923.	-21051.	-4236.	-8447.	-5224.	-7391.	-1662.	-6634.	-21061.	-54644.
1933	-1260.	-3520.	-4416.	-33509.	-20318.	-17031.	-28665.	-23620.	-5625.	-9196.	-69316.	-137964.
1934	-4752.	-3053.	-5086.	-55495.	-51207.	-7254.	23833.	-5968.	-3190.	-12891.	10611.	-112171.
1935	-2567.	-1077.	-1244.	-59679.	-30151.	-12001.	-44611.	-16014.	-484.	-4888.	-72626.	-167828.
1936	-1801.	-10209.	-8855.	-30716.	-56681.	-2664.	-82806.	-19452.	-5273.	-20865.	-104923.	-218458.
1937	1283.	-3201.	1829.	-9030.	-107.	2202.	-56146.	-1793.	3753.	-88.	-55738.	-61210.
1938	-2642.	342.	-998.	-10139.	-12512.	9223.	-38610.	2227.	-3038.	-3298.	-27161.	-56149.
1939	-4427.	-10820.	-10927.	-35002.	-55257.	-7094.	-47943.	8351.	-1365.	-26173.	-46687.	-164484.
1940	-2769.	-5669.	-8096.	-53939.	-105931.	-17221.	65252.	20691.	-7139.	-16534.	68723.	-114820.
1941	-1447.	-3855.	-686.	2826.	-32364.	2876.	3763.	-51076.	8598.	-5987.	-44437.	-71385.
1942	838.	3513.	7586.	68770.	92814.	23245.	38880.	48154.	15018.	11937.	110279.	298817.
1943	-711.	670.	1160.	-25010.	-57129.	-6963.	1840.	-7043.	7672.	1119.	-12167.	-85515.
1944	941.	-1578.	-2415.	-4600.	-2407.	5662.	5083.	1148.	12660.	-3052.	11893.	14494.
1945	-1286.	599.	-2671.	19851.	12281.	13968.	4365.	2016.	11711.	-3358.	20349.	60834.
1946	-473.	-550.	803.	-9301.	-15212.	1516.	1488.	7974.	7242.	-219.	10979.	-6511.
1947	-4653.	-12223.	-12681.	-77784.	-106380.	-15815.	-50313.	-38762.	-9455.	-29557.	-104839.	-328066.
1948	1136.	-2496.	-1060.	-3985.	36032.	17716.	11238.	21313.	9971.	-2420.	50266.	84864.
1949	1145.	4168.	4481.	36159.	55506.	18313.	65042.	19506.	7525.	9794.	102861.	211844.
1950	474.	-6634.	-6745.	5289.	95356.	4392.	-23221.	30234.	4495.	-12905.	11405.	103640.
1951	411.	7456.	3270.	52381.	20156.	24161.	88684.	57342.	8851.	11137.	170187.	262712.
1952	-536.	-2805.	-3775.	-23509.	42617.	30931.	66869.	171989.	21985.	-7117.	269790.	303766.
1953	317.	-1117.	99.	-9734.	26398.	-17760.	-20254.	-45863.	9733.	-701.	-83677.	-58180.
1954	279.	-1177.	-1531.	-3705.	80901.	4009.	71291.	36091.	18166.	-2429.	111390.	204224.
1955	-1851.	-8213.	-6903.	-13316.	-34980.	-14635.	-14418.	-20529.	808.	-16968.	-49582.	-114038.
1956	-1305.	-4387.	-5806.	-24517.	35385.	-997.	-20702.	15671.	14287.	-11497.	-6028.	7629.
1957	1566.	-6679.	-4250.	35269.	164097.	5876.	55782.	114009.	23965.	-9363.	175867.	389636.
1958	1717.	-3677.	-5802.	13141.	123673.	-4504.	30007.	46057.	30265.	-7562.	71559.	231076.
1959	316.	-17.	-1403.	12810.	-10486.	20530.	61430.	66069.	8527.	-1104.	148028.	157775.
1960	-776.	-5254.	-7137.	-15129.	77857.	19159.	56798.	54697.	531.	-13168.	130654.	180746.
1961	951.	-1749.	-4020.	7946.	50829.	-7158.	-3346.	-7310.	1718.	-4818.	-17814.	37862.
1962	1412.	254.	-311.	42867.	28862.	39721.	113780.	96050.	8507.	1355.	249551.	381142.
1963	63.	-346.	388.	-4150.	62592.	43306.	106580.	78957.	77.	85.	228843.	207447.
1964	-320.	-79.	1210.	27706.	63310.	64271.	266802.	135802.	32680.	811.	466876.	591384.

REAL WEALTH GAIN OR LOSS FROM TOTAL AGRICULTURAL ASSETS 1926-64

QUANTITY COMPONENT B -AGGREGATE-

-THOUSANDS OF DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1926	4627.	2187.	4557.	-21777.	8263.	42919.	-10295.	-8245.	-9649.	11370.	24379.	12587.
1927	-2533.	696.	-3503.	19660.	8958.	2032.	-37172.	-142.	633.	-5340.	-35283.	-11373.
1928	-26.	-4429.	-10149.	-1461.	7556.	9981.	59766.	10080.	924.	-14604.	79827.	72242.
1929	2860.	-3807.	-13585.	-2377.	-43218.	-68673.	108144.	138838.	16086.	-14533.	178309.	134267.
1930	878.	4775.	7397.	30381.	61445.	-2092.	17228.	15555.	3037.	13049.	30691.	138603.
1931	32.	3970.	2083.	11531.	-43525.	-9456.	-18065.	-15966.	174.	6084.	-43487.	-69221.
1932	-207.	-5610.	-2146.	-24576.	-8348.	-9461.	-7165.	-10347.	-1962.	-7963.	-26971.	-69820.
1933	-1631.	-4795.	-5276.	-39148.	-27706.	-19761.	-32968.	-25736.	-6373.	-11701.	-78465.	-163392.
1934	-5474.	-5178.	-6004.	-86998.	-62685.	-7727.	21456.	-6343.	-3365.	-16856.	7385.	-162317.
1935	-2894.	-1231.	-1374.	-71988.	-34498.	-14815.	-54198.	-17307.	-841.	-5499.	-86320.	-199147.
1936	-1886.	-12574.	-10505.	-33413.	-61322.	-2986.	-92990.	-21109.	-6040.	-24966.	-117085.	-242826.
1937	898.	-3307.	1332.	-10955.	-1700.	1953.	-61960.	-2104.	3210.	-1077.	-62111.	-72632.
1938	-3029.	248.	-1226.	-12078.	-19708.	7754.	-46360.	455.	-3307.	-4007.	-38151.	-77250.
1939	-5091.	-13596.	-13864.	-38313.	-59132.	-8173.	-52471.	5880.	-1779.	-32551.	-54763.	-186539.
1940	-3820.	-7219.	-10393.	-67706.	-125244.	-22307.	39777.	-3583.	-8589.	-21431.	13797.	-209174.
1941	-2000.	-4454.	-737.	1818.	-37923.	2331.	2813.	-69093.	7881.	-7190.	-63949.	-99362.
1942	230.	2409.	5092.	51311.	76677.	19226.	30390.	37972.	13456.	7731.	87589.	236764.
1943	-765.	594.	914.	-27820.	-61823.	-7520.	1198.	-7271.	7192.	743.	-13594.	-95302.
1944	819.	-1768.	-2732.	-6493.	-5514.	3293.	-2575.	-3646.	11570.	-3661.	-2928.	-7047.
1945	-1398.	494.	-2844.	18943.	10525.	7949.	-710.	-1520.	10304.	-3748.	5719.	41743.
1946	-789.	-744.	516.	-10148.	-17195.	851.	-577.	4922.	6592.	-1017.	5196.	-16572.
1947	-5395.	-14608.	-15136.	-91210.	-121762.	-20317.	-61792.	-46432.	-12057.	-35140.	-128541.	-388710.
1948	787.	-2575.	-1121.	-12078.	32506.	15015.	5992.	16786.	9587.	-2909.	37793.	64900.
1949	1665.	3793.	4077.	33727.	50677.	10381.	54933.	12142.	6228.	8935.	77456.	177023.
1950	-118.	-7539.	-7746.	1722.	77652.	267.	-32257.	16471.	2358.	-15404.	-15519.	50809.
1951	362.	5951.	2918.	43815.	18979.	22752.	81490.	51066.	8301.	9231.	155308.	235635.
1952	-1169.	-3759.	-4369.	-29491.	29092.	26796.	59392.	147712.	20459.	-9298.	233900.	244662.
1953	226.	-1398.	-352.	-13011.	23489.	-19690.	-25430.	-49812.	8989.	-1523.	-94932.	-76938.
1954	207.	-1483.	-1814.	-4445.	73859.	1806.	62224.	31911.	16936.	-3090.	95941.	179200.
1955	-1981.	-8790.	-7242.	-14502.	-39418.	-17146.	-19794.	-23779.	539.	-18013.	-60719.	-132112.
1956	-1383.	-4690.	-6164.	-25290.	33535.	-2153.	-21273.	13007.	13178.	-12237.	-10419.	-1232.
1957	1351.	-7359.	-4793.	30291.	142864.	403.	46984.	102143.	21384.	-10801.	149530.	383269.
1958	1586.	-4737.	-5964.	12243.	113953.	-6398.	27890.	43849.	27945.	-9115.	65341.	210368.
1959	314.	-83.	-1490.	12278.	-10555.	19352.	58255.	62293.	8361.	-1259.	139900.	148725.
1960	-799.	-5590.	-7657.	-16361.	68072.	17667.	52667.	51340.	139.	-14047.	121674.	159477.
1961	869.	-1853.	-4339.	7248.	49361.	-7858.	-7680.	-11312.	1613.	-5323.	-26849.	26050.
1962	1339.	195.	-407.	40604.	28018.	36799.	102086.	88428.	7563.	1127.	227313.	304625.
1963	-16.	-372.	341.	-4914.	60916.	40452.	99023.	74085.	-580.	-47.	213560.	268535.
1964	-370.	-369.	833.	24754.	56648.	52869.	229115.	109610.	28848.	94.	391595.	501939.

REAL WEALTH GAIN OR LOSS FROM TOTAL AGRICULTURAL ASSETS 1926-64

ESTIMATED QUANTITY COMPONENT-AGGREGATE-

-THOUSANDS OF DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	NUF.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1926	5038.	2461.	4669.	-13319.	18105.	45007.	-6016.	-44.	-7320.	12188.	38947.	48601.
1927	-2119.	1929.	-3375.	22241.	11880.	2601.	-34039.	2057.	945.	-3565.	-29381.	2119.
1928	12.	-3999.	-3562.	-238.	3578.	10647.	64870.	11413.	1036.	-12549.	86931.	83757.
1929	3438.	-3736.	-1287.	2005.	-39536.	-63970.	118518.	179030.	18025.	-13175.	233578.	200896.
1930	1310.	5165.	7761.	33325.	85095.	986.	20588.	18203.	3781.	14241.	39777.	156218.
1931	42.	4094.	2218.	12030.	-40670.	-9012.	-18387.	-15399.	241.	6351.	-40796.	-62847.
1932	-160.	-5104.	-2034.	-22813.	-6292.	-8954.	-6193.	-8869.	-1812.	-7298.	-24016.	-82232.
1933	-1445.	-4157.	-4846.	-36228.	-24012.	-18396.	-30817.	-24678.	-5999.	-10449.	-73891.	-150678.
1934	-5113.	-4116.	-5545.	-71246.	-56946.	-7491.	22644.	-6156.	-3277.	-14773.	8998.	-137244.
1935	-2730.	-1154.	-1309.	-65833.	-32325.	-13408.	-49404.	-16661.	-662.	-5194.	-79473.	-183487.
1936	-1844.	-11392.	-9680.	-32064.	-59002.	-2825.	-87898.	-20281.	-5657.	-22915.	-111004.	-230642.
1937	1091.	-3254.	1582.	-9993.	-904.	2077.	-59053.	-1948.	3482.	-582.	-58924.	-66921.
1938	-2835.	295.	-1112.	-11109.	-16110.	8488.	-42485.	1341.	-3173.	-3652.	-32656.	-66699.
1939	-4759.	-12208.	-12398.	-36657.	-57195.	-7633.	-50207.	7115.	-1572.	-29362.	-50725.	-175511.
1940	-3294.	-6444.	-9244.	-60823.	-115587.	-19809.	52515.	8554.	-7864.	-18983.	41260.	-161997.
1941	-1723.	-4154.	-711.	2322.	-35153.	2603.	3288.	-60085.	8239.	-6589.	-54193.	-85374.
1942	534.	2961.	6339.	60040.	84745.	21236.	34635.	43063.	14237.	9834.	98934.	267791.
1943	-738.	632.	1037.	-26415.	-59476.	-7242.	1519.	-7157.	7432.	931.	-12680.	-90408.
1944	880.	-1673.	-2573.	-5546.	-3961.	4478.	1254.	-1249.	12115.	-5367.	4482.	3724.
1945	-1342.	547.	-2757.	19397.	11403.	10959.	1827.	248.	11007.	-3553.	19034.	51259.
1946	-631.	-647.	660.	-9724.	-16204.	1183.	456.	6448.	6917.	-618.	8087.	-11542.
1947	-5024.	-13415.	-13910.	-84497.	-114071.	-18066.	-56052.	-42597.	-10756.	-32349.	-116715.	-358368.
1948	961.	-2536.	-1090.	-10531.	34269.	16365.	8615.	19049.	9779.	-2665.	44029.	74882.
1949	1105.	3981.	4279.	34943.	53091.	14347.	59987.	15824.	6876.	9365.	90158.	194434.
1950	178.	-7087.	-7246.	3505.	86504.	2329.	-27738.	23352.	3427.	-14154.	-2057.	77225.
1951	387.	6703.	3094.	48098.	19568.	23456.	85087.	54204.	8576.	10184.	162747.	249173.
1952	-853.	-3282.	-4072.	-26500.	35855.	28863.	63131.	159850.	21222.	-8207.	251845.	274214.
1953	272.	-1257.	-126.	-11372.	24944.	-18725.	-22842.	-47838.	9361.	-1112.	-89405.	-67584.
1954	243.	-1330.	-1672.	-4075.	77380.	2907.	66757.	34001.	17551.	-2759.	103665.	191762.
1955	-1916.	-8502.	-7073.	-13909.	-37199.	-15890.	-17106.	-22154.	673.	-17490.	-55150.	-123075.
1956	-1344.	-4538.	-5985.	-24903.	34460.	-1575.	-20988.	14339.	13732.	-11867.	-8223.	3198.
1957	1459.	-7019.	-4521.	32780.	158481.	3140.	51383.	108076.	22675.	-10082.	162599.	361452.
1958	1651.	-4207.	-5783.	12692.	118813.	-5451.	28948.	44953.	29105.	-8338.	68450.	220722.
1959	315.	-50.	-1446.	12544.	-10521.	19941.	59843.	64181.	8444.	-1181.	143964.	153250.
1960	-788.	-5422.	-7397.	-15745.	72965.	18413.	54732.	53019.	335.	-13607.	126164.	170112.
1961	910.	-1801.	-4179.	7597.	50095.	-7508.	-5513.	-9311.	1665.	-5070.	-22331.	31956.
1962	1370.	225.	-359.	41736.	28440.	38260.	107933.	92239.	8035.	1241.	238432.	517834.
1963	23.	-359.	354.	-4532.	61754.	41879.	102802.	76521.	-251.	19.	221202.	278191.
1964	-345.	-224.	1022.	26230.	59979.	58570.	247959.	122706.	30764.	453.	429235.	546601.

ESTIMATED PRICE COMPONENT-AGGREGATE-

-THOUSANDS OF DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1926	-4193.	-1867.	-4765.	24713.	9616.	-28379.	28875.	40546.	11884.	-10825.	41042.	76430.
1927	4221.	978.	5933.	851.	13816.	12292.	62920.	21360.	7093.	11132.	96572.	129485.
1928	587.	5228.	9873.	25264.	-1612.	-7851.	-55550.	10052.	2726.	15688.	-53350.	-11235.
1929	-4460.	-16198.	-16713.	-120404.	-190445.	-58387.	-153173.	-95313.	-26522.	-37372.	-306873.	-681615.
1930	-11280.	-15542.	-14875.	-164584.	-219148.	-77729.	-196503.	-164860.	-17697.	-39496.	-439091.	-880016.
1931	-5733.	-9179.	-10481.	-81926.	-188469.	-40762.	-166103.	-112297.	-21465.	-25392.	-319162.	-636414.
1932	1489.	-736.	1505.	-1091.	15629.	1625.	3729.	-25435.	-1661.	2208.	-20081.	-4995.
1933	3505.	5683.	4198.	3781.	91133.	22654.	25386.	19867.	554.	13487.	67907.	176861.
1934	-1004.	6742.	2056.	85077.	31920.	4403.	41918.	8596.	-1108.	8593.	54916.	180198.
1935	2006.	9798.	8221.	3330.	69715.	-3986.	-55223.	10330.	6306.	20026.	-48879.	50498.
1936	4472.	3453.	3184.	50364.	86341.	23148.	29610.	20429.	3216.	11109.	73187.	224217.
1937	-67.	-6279.	-1218.	-13457.	-39070.	-13066.	-1850.	-28743.	691.	-7564.	-43659.	-103059.
1938	730.	7087.	4928.	42010.	36141.	14670.	11661.	31941.	2381.	12745.	58272.	151548.
1939	169.	-627.	-1658.	23222.	39319.	-2839.	17589.	14796.	876.	-2117.	29545.	90845.
1940	4146.	9024.	7086.	84884.	62422.	27197.	461.	39914.	9960.	20257.	67572.	245096.
1941	5659.	9820.	12795.	89558.	124226.	31189.	80775.	71178.	12887.	28275.	183141.	438086.
1942	2338.	6397.	8649.	63250.	146332.	27872.	24564.	60547.	7074.	17384.	122983.	357023.
1943	4020.	10165.	12226.	31825.	70922.	21336.	99901.	45032.	9775.	26411.	166269.	305212.
1944	1218.	554.	629.	-2095.	-3134.	11978.	42534.	28791.	6680.	2402.	83304.	87156.
1945	864.	3217.	1388.	34244.	54297.	49325.	54575.	39444.	8776.	5470.	143344.	246130.
1946	5173.	9116.	10640.	58140.	121664.	42061.	118601.	137542.	20127.	24929.	298403.	523263.
1947	9540.	17442.	15598.	136658.	238752.	130971.	229946.	256756.	38231.	42580.	617673.	1073893.
1948	2772.	4804.	4976.	4954.	82580.	47641.	59684.	94782.	21033.	12552.	202106.	323225.
1949	3099.	5995.	9538.	73894.	88161.	64140.	100325.	106540.	22012.	18630.	271004.	473702.
1950	11157.	17918.	16160.	182453.	391738.	102664.	247271.	190188.	42820.	45234.	540125.	1202367.
1951	-1938.	-4129.	-4051.	-27521.	-54660.	-9515.	4553.	-58198.	-8466.	-10119.	-63160.	-163935.
1952	191.	293.	2958.	6046.	62412.	52432.	28180.	136676.	10585.	3442.	217288.	299773.
1953	-1149.	-552.	-2341.	18946.	18548.	-38000.	-34000.	-49778.	5467.	-4041.	-121778.	-82858.
1954	-354.	1065.	1468.	-718.	52694.	7681.	73264.	16742.	10239.	2179.	97667.	162063.
1955	3098.	6170.	5593.	55544.	103256.	35582.	74654.	53909.	10233.	14860.	164345.	348238.
1956	3071.	4726.	5564.	41866.	121849.	-5229.	54246.	50828.	23591.	13361.	99844.	300511.
1957	3407.	6576.	5904.	51274.	156450.	63741.	95907.	134161.	21175.	15888.	293809.	538602.
1958	2371.	5561.	4109.	31023.	140120.	5993.	73602.	53702.	28658.	12040.	133296.	345138.
1959	-80.	-929.	-932.	11456.	-19998.	42740.	91556.	82497.	12112.	-1941.	216793.	218423.
1960	1073.	3615.	4315.	30436.	128045.	27584.	61538.	46239.	6252.	9003.	135361.	309097.
1961	2698.	1295.	196.	20756.	115458.	32220.	168979.	133845.	17448.	4186.	335044.	492892.
1962	797.	546.	-113.	20473.	42863.	42207.	292800.	132455.	7027.	1231.	467462.	539555.
1963	2943.	4789.	4972.	53546.	213709.	85929.	367253.	213767.	23960.	12703.	666949.	970867.
1964	4047.	6056.	4108.	66573.	197308.	76758.	342430.	222243.	26497.	13211.	641431.	945020.

REAL WEALTH GAIN OR LOSS FROM TOTAL AGRICULTURAL ASSETS 1926-64

COMPOSITE FARM COST COMPENSATION-AGGREGATE-

-THOUSANDS OF DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1926	-770.	-1541.	-1622.	-12602.	-20241.	-10740.	-27522.	-16389.	-3581.	-3938.	-54651.	-95013.
1927	371.	731.	765.	6014.	9711.	-7994.	-20207.	-12414.	-2652.	1867.	-40615.	-25675.
1928	-1414.	-2759.	-2880.	-22690.	-36404.	-5385.	-13530.	-8365.	-1815.	-7053.	-27280.	-95242.
1929	-112.	-219.	-228.	-1822.	-2870.	496.	1248.	785.	170.	-559.	2529.	-2553.
1930	-4973.	-8406.	-8137.	-73527.	-112639.	-15679.	-48759.	-34257.	-6496.	-21516.	-98695.	-312873.
1931	-7076.	-12986.	-12716.	-106561.	-168945.	-34494.	-112907.	-77254.	-15897.	-32778.	-224655.	-548837.
1932	-4235.	-8202.	-7768.	-65043.	-93613.	-19080.	-61336.	-41805.	-8891.	-20204.	-122221.	-309972.
1933	-1224.	-2179.	-2178.	-17795.	-26602.	-6374.	-20901.	-13609.	-2969.	-5581.	-40883.	-93830.
1934	3225.	5608.	5480.	43217.	71251.	7278.	23440.	15235.	3227.	14313.	45953.	177961.
1935	52.	105.	97.	801.	1269.	672.	2316.	1424.	292.	254.	4412.	7027.
1936	1081.	2386.	2183.	15440.	27455.	1587.	5244.	3522.	757.	5650.	10353.	59654.
1937	4031.	7835.	7229.	56100.	99351.	15145.	44296.	31545.	6664.	19095.	90985.	272195.
1938	-1957.	-3379.	-3456.	-25851.	-45839.	-2469.	-7057.	-5124.	-1165.	-8793.	-14670.	-96316.
1939	-1351.	-2625.	-2586.	-19403.	-33482.	-8407.	-21468.	-16953.	-3651.	-6562.	-46828.	-109925.
1940	4210.	7823.	7576.	65220.	113028.	31419.	79668.	67414.	14006.	19609.	178497.	390359.
1941	3973.	7468.	6840.	62476.	100279.	18416.	48558.	41286.	8146.	18281.	108260.	297442.
1942	5367.	9905.	9796.	87534.	134366.	15951.	41843.	33000.	7319.	25068.	90794.	345081.
1943	3545.	6809.	7111.	62840.	99207.	7064.	17535.	14648.	3221.	17464.	39248.	221979.
1944	706.	1411.	1498.	11860.	18759.	2872.	7566.	6013.	1380.	3615.	16451.	52064.
1945	1275.	2435.	2569.	20510.	32549.	1851.	4877.	3846.	934.	6280.	10573.	70845.
1946	1858.	3695.	3730.	31810.	49870.	17121.	41704.	32728.	8286.	9283.	91554.	190803.
1947	5561.	11011.	11357.	92648.	147838.	47798.	117523.	96552.	23637.	27929.	261833.	553864.
1948	11845.	22598.	22876.	193318.	315704.	117458.	270812.	234989.	53152.	57318.	623258.	1242751.
1949	2288.	4210.	4313.	35222.	61542.	42073.	92459.	83358.	19145.	10812.	217890.	344611.
1950	1800.	3365.	3532.	28751.	49075.	18472.	40317.	35844.	8250.	8697.	94632.	189404.
1951	9181.	16874.	16616.	147179.	268155.	110345.	239682.	215299.	49206.	41871.	565326.	1071737.
1952	4841.	8774.	8865.	80166.	141958.	55447.	123971.	106327.	24362.	22479.	285744.	554709.
1953	-2168.	-3875.	-3964.	-35583.	-66433.	-33070.	-70985.	-68009.	-14402.	-10002.	-172064.	-298483.
1954	-670.	-1199.	-1221.	-11200.	-21144.	2847.	6304.	5911.	1357.	-3090.	15061.	-19016.
1955	637.	1139.	1161.	10625.	21115.	-1913.	-4468.	-4030.	-958.	2937.	-10412.	23308.
1956	2301.	3994.	4095.	38966.	76982.	1467.	3443.	3075.	736.	10390.	7985.	135059.
1957	3298.	5617.	5736.	55378.	114066.	41711.	99995.	90826.	22652.	14651.	232532.	439279.
1958	1144.	1839.	1901.	19235.	41325.	25843.	61631.	58659.	14220.	4884.	146132.	225796.
1959	3145.	4889.	4953.	52099.	117348.	16983.	42145.	40130.	10278.	12986.	99258.	291970.
1960	2022.	3116.	3127.	33924.	74629.	11134.	27588.	26295.	6564.	8264.	65017.	188398.
1961	1724.	2616.	2603.	29100.	67036.	12001.	29761.	28245.	6862.	6943.	70007.	179946.
1962	2783.	4064.	3947.	46159.	109131.	22156.	56861.	53390.	12761.	10799.	132407.	311256.
1963	3531.	5064.	4875.	59361.	137723.	45554.	123386.	110401.	24997.	13470.	279142.	514692.
1964	2681.	3850.	3733.	45053.	108656.	29401.	82577.	71128.	15215.	10264.	183106.	362234.

REAL WEALTH GAIN OR LOSS FROM TOTAL AGRICULTURAL ASSETS 1926-64

FARM LIVING COST COMPENSATION-AGGREGATE-

-THOUSANDS OF DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PE.	CANADA
1926	-1114.	-2212.	-2329.	-18098.	-29069.	-14033.	-35962.	-21415.	-4680.	-5656.	-71410.	-128912.
1927	-470.	-925.	-969.	-7612.	-12293.	-3710.	-9377.	-5760.	-1231.	-2363.	-18847.	-42347.
1928	-434.	-846.	-883.	-6959.	-11165.	-6707.	-16851.	-10418.	-2261.	-2163.	-33976.	-56523.
1929	-1320.	-2578.	-2692.	-21487.	-33843.	-12175.	-30638.	-19268.	-4163.	-6591.	-62081.	-128134.
1930	-3868.	-6538.	-6329.	-57187.	-87608.	-12576.	-39108.	-27476.	-5210.	-16735.	-79180.	-248899.
1931	-6655.	-12212.	-11959.	-100214.	-158883.	-32323.	-105800.	-72391.	-14897.	-30825.	-210514.	-515333.
1932	-3058.	-5923.	-5609.	-46968.	-67599.	-19839.	-63775.	-43468.	-9245.	-14590.	-127082.	-265483.
1933	-1941.	-3456.	-3455.	-28227.	-42198.	-6987.	-22912.	-14919.	-3255.	-8852.	-44819.	-127351.
1934	1915.	3330.	3254.	25660.	42306.	6888.	22185.	14419.	3054.	8499.	43491.	123010.
1935	-103.	-207.	-191.	-1581.	-2505.	0.	0.	0.	0.	-501.	0.	-4587.
1936	764.	1687.	1543.	10914.	19407.	633.	2091.	1404.	302.	3994.	4128.	38745.
1937	2483.	4826.	4452.	34552.	61190.	15818.	46265.	32947.	6960.	11760.	95030.	209493.
1938	-617.	-1065.	-1089.	-8147.	-14446.	-3416.	-9684.	-7032.	-1599.	-2771.	-20132.	-47096.
1939	-1099.	-2135.	-2103.	-15778.	-27228.	-8078.	-20629.	-16290.	-3508.	-5336.	-44998.	-96848.
1940	3390.	6301.	6102.	52529.	91034.	28741.	72887.	61677.	12814.	15793.	163305.	335475.
1941	2821.	5301.	4856.	44350.	71185.	16037.	42285.	35953.	7094.	12977.	94274.	229880.
1942	4641.	8565.	8471.	75692.	116188.	16837.	44167.	34832.	7726.	21677.	95035.	317118.
1943	3403.	6536.	6826.	60322.	95232.	11794.	29277.	24457.	5378.	16765.	65528.	243224.
1944	2046.	4091.	4343.	34385.	54389.	5746.	15143.	12034.	2763.	10480.	32925.	134941.
1945	1046.	1997.	2107.	16818.	26690.	1104.	2909.	2294.	557.	5150.	6307.	55521.
1946	1869.	3717.	3752.	32001.	50168.	14557.	35457.	27826.	7045.	9338.	77839.	176591.
1947	5321.	10537.	10867.	88655.	141466.	50866.	125170.	102834.	25175.	26725.	278869.	560891.
1948	10780.	20567.	20821.	175951.	287343.	120332.	277438.	240738.	54452.	52169.	638508.	1208423.
1949	3950.	7266.	7446.	60803.	106240.	51164.	112437.	101368.	23281.	18664.	264969.	473957.
1950	2642.	4940.	5186.	42208.	72045.	22292.	48655.	43257.	9957.	12768.	114205.	251183.
1951	8671.	15181.	15492.	139001.	253254.	107195.	232839.	209153.	47801.	39544.	549187.	1028788.
1952	4886.	8856.	8948.	80921.	143294.	51502.	115150.	98762.	22628.	22691.	265414.	534949.
1953	-1193.	-2138.	-2187.	-19629.	-36648.	-28683.	-61569.	-58988.	-12492.	-5518.	-149240.	-223526.
1954	-187.	-335.	-341.	-3128.	-5903.	5573.	12341.	11572.	2658.	-863.	29486.	22248.
1955	-375.	-670.	-683.	-6248.	-12416.	-4202.	-9811.	-8850.	-2103.	-1727.	-22862.	-45356.
1956	2137.	3709.	3803.	36188.	71495.	4305.	10104.	9025.	2159.	9650.	23434.	142926.
1957	2963.	5046.	5153.	49749.	102473.	37371.	89591.	81377.	20295.	13162.	208339.	394019.
1958	2056.	3306.	3417.	34574.	74279.	16551.	39472.	37569.	9108.	8779.	93593.	220332.
1959	2336.	3633.	3680.	38710.	87190.	12465.	30934.	29455.	7544.	9649.	72854.	215947.
1960	1860.	2866.	2876.	31207.	68853.	6026.	14932.	14232.	3552.	7603.	35190.	146205.
1961	1487.	2257.	2245.	25101.	57824.	13525.	33540.	31831.	7733.	5989.	78896.	175542.
1962	2454.	3577.	3474.	40628.	96054.	23107.	59302.	55682.	13309.	9505.	138090.	297586.
1963	2603.	3733.	3594.	43758.	101523.	44567.	121244.	108485.	24563.	9929.	274296.	454870.
1964	3274.	4702.	4559.	55024.	132701.	21071.	59179.	50974.	10904.	12536.	131224.	342348.

REAL WEALTH GAIN OR LOSS FROM TOTAL AGRICULTURAL ASSETS 1926-64

URBAN LIVING COST COMPENSATION-AGGREGATE-

-THOUSANDS OF DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	P.R.	CANADA
1926	702.	1394.	1468.	11407.	18321.	5852.	14995.	8929.	1951.	3565.	29778.	65020.
1927	-1144.	-2252.	-2359.	-18587.	-29936.	-9694.	-24504.	-15053.	-3216.	-5755.	-49251.	-106695.
1928	277.	540.	564.	4445.	7131.	2338.	5869.	3628.	787.	1382.	11633.	25579.
1929	835.	1630.	1702.	13583.	21394.	7014.	17650.	11100.	2398.	4166.	35763.	77305.
1930	-451.	-763.	-739.	-6675.	-10226.	-3042.	-9460.	-6647.	-1260.	-1953.	-19149.	-39263.
1931	-5746.	-10544.	-10325.	-86529.	-137106.	-37771.	-123633.	-84592.	-17408.	-26616.	-245997.	-513735.
1932	-4819.	-9334.	-8839.	-74018.	-106531.	-30549.	-98202.	-66933.	-14236.	-22992.	-195684.	-413461.
1933	-2544.	-4528.	-4526.	-36981.	-55284.	-15362.	-50441.	-32844.	-7165.	-11597.	-98666.	-209693.
1934	766.	1332.	1301.	10262.	16918.	4511.	14527.	9442.	2000.	3399.	28480.	61058.
1935	337.	674.	624.	5160.	8177.	2204.	7600.	4674.	957.	1635.	14478.	30408.
1936	989.	2183.	1997.	14125.	25117.	6220.	20552.	13801.	2965.	5169.	40574.	87951.
1937	1616.	3142.	2899.	22495.	39838.	10288.	30090.	21428.	4527.	7657.	61806.	136323.
1938	589.	1017.	1040.	7777.	13790.	3554.	10074.	7315.	1664.	2645.	20943.	46818.
1939	-399.	-776.	-764.	-5737.	-9899.	-2692.	-6875.	-5429.	-1169.	-1940.	-14997.	-33742.
1940	1832.	3404.	3297.	28379.	49181.	13154.	33358.	28227.	5865.	8532.	74739.	166695.
1941	2799.	5261.	4819.	44015.	70647.	20178.	53203.	45236.	8925.	12879.	118617.	255083.
1942	2422.	4471.	4422.	39512.	60651.	17719.	46481.	36657.	8130.	11315.	100856.	220465.
1943	962.	1848.	1930.	17059.	26931.	7540.	18715.	15634.	3438.	4741.	41889.	94058.
1944	309.	617.	655.	5186.	8202.	2355.	6204.	4930.	1132.	1580.	13489.	29569.
1945	318.	608.	641.	5117.	8121.	2431.	6406.	5052.	1227.	1567.	13888.	29920.
1946	1962.	3903.	3940.	33602.	52678.	17121.	41704.	32728.	8286.	9805.	91554.	195924.
1947	5973.	11827.	12198.	99518.	158793.	52456.	129083.	106048.	25962.	29099.	287587.	601853.
1948	9772.	18044.	18874.	159497.	260471.	96362.	222174.	192785.	43606.	47291.	511821.	1022186.
1949	2216.	4078.	4178.	34115.	59608.	22695.	49874.	44964.	10327.	10472.	117533.	232055.
1950	1517.	2637.	2978.	24237.	41371.	16245.	35457.	31523.	7256.	7332.	83226.	163422.
1951	10002.	17511.	18101.	160341.	292135.	105217.	228543.	205294.	46919.	45615.	539054.	1084064.
1952	2109.	3825.	3863.	34931.	61856.	22933.	51275.	43977.	10076.	9795.	118185.	234843.
1953	-730.	-1307.	-1337.	-12000.	-22404.	-8691.	-18656.	-17874.	-3785.	-3373.	-45222.	-86784.
1954	510.	912.	929.	8517.	16079.	5792.	12826.	12026.	2762.	2350.	30644.	60352.
1955	145.	258.	263.	2410.	4789.	1663.	3882.	3502.	832.	666.	9047.	17744.
1956	1244.	2159.	2214.	21065.	41618.	14401.	33800.	30190.	7222.	5617.	78391.	153912.
1957	2796.	4763.	4864.	46956.	96719.	31508.	75535.	68610.	17111.	12423.	175654.	348864.
1958	2409.	3874.	4004.	40514.	87041.	27461.	65490.	62332.	15111.	10288.	155283.	308237.
1959	1072.	1667.	1688.	17761.	40004.	11713.	29066.	27676.	7088.	4427.	68455.	137735.
1960	1139.	1754.	1761.	19103.	42025.	13154.	32593.	31064.	7754.	4654.	70811.	150347.
1961	903.	1370.	1363.	15241.	35111.	10831.	26659.	25491.	6193.	3636.	63181.	127383.
1962	1160.	1691.	1642.	19283.	45401.	13699.	35159.	33013.	7890.	4493.	81871.	159003.
1963	1797.	2577.	2480.	30203.	70075.	22182.	60346.	53995.	12225.	6854.	136523.	259860.
1964	1806.	2722.	2640.	31655.	76827.	25052.	70261.	60606.	12964.	7257.	156019.	294932.

REAL WEALTH GAIN OR LOSS FROM TOTAL AGRICULTURAL ASSETS 1926-64

REAL GAIN (FARM COSTS)-AGGREGATE-

-THOUSANDS OF DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1926	-3418.	-320.	-3143.	37315.	29858.	-17639.	56397.	56935.	15465.	-6887.	95693.	171444.
1927	3850.	247.	5168.	-5163.	4105.	20287.	83127.	33774.	9745.	9265.	137188.	155140.
1928	2001.	7987.	12753.	47954.	34791.	-2466.	-42020.	18416.	4541.	22740.	-26070.	83957.
1929	-4348.	-15979.	-16485.	-118582.	-187575.	-58883.	-154421.	-96098.	-26691.	-36813.	-309401.	-679062.
1930	-6306.	-5136.	-6537.	-91057.	-106509.	-62049.	-147744.	-130602.	-11201.	-17980.	-340396.	-567148.
1931	1344.	3807.	2235.	24635.	-19523.	-6268.	-53195.	-35044.	-5567.	7385.	-94507.	-87577.
1932	5724.	7416.	9273.	63952.	109242.	20705.	65065.	16370.	7230.	22413.	102140.	304977.
1933	4829.	7862.	6376.	21576.	117735.	29028.	46286.	33476.	3523.	19067.	108790.	270692.
1934	-4229.	1134.	-2624.	42660.	-39332.	-2875.	18478.	-6639.	-4335.	-5720.	8963.	2237.
1935	1954.	9694.	8124.	2529.	68446.	-4658.	-57539.	8906.	6015.	19772.	-53291.	43471.
1936	3892.	1066.	1001.	54925.	58886.	21561.	243e6.	16907.	2459.	5459.	62834.	164563.
1937	-4097.	-14115.	-8446.	-59557.	-138421.	-28211.	-46146.	-60287.	-5973.	-26858.	-134644.	-375254.
1938	2688.	10465.	8384.	67860.	61980.	17159.	18718.	37065.	3546.	21538.	72942.	247866.
1939	1520.	1998.	927.	42625.	72800.	5567.	39057.	31748.	4527.	4445.	76373.	200770.
1940	-63.	1201.	-490.	19685.	-50605.	-4218.	-79207.	-27500.	-4046.	648.	-110924.	-145263.
1941	1686.	2352.	5955.	27082.	23947.	12773.	32217.	29892.	4741.	9993.	74881.	140645.
1942	-3029.	-3507.	-1147.	-24285.	11967.	11921.	-7279.	27547.	-246.	-7684.	32189.	11942.
1943	475.	3356.	5115.	-31015.	-28275.	14272.	82366.	30384.	6554.	8947.	127021.	83232.
1944	512.	-857.	-869.	-13954.	-21893.	9106.	34968.	22779.	5299.	-1213.	66853.	36002.
1945	-411.	782.	-1181.	13734.	21748.	47475.	49698.	35598.	7842.	-810.	132771.	175285.
1946	3315.	5421.	6910.	26330.	71794.	24939.	77097.	104813.	11841.	15646.	206849.	332460.
1947	3979.	6431.	4241.	44010.	90914.	83213.	112423.	160204.	14594.	14651.	355340.	520009.
1948	-9073.	-17794.	-17900.	-188364.	-233124.	-69817.	-211128.	-140207.	-32119.	-44767.	-421152.	-919526.
1949	811.	1782.	5225.	38672.	26620.	22067.	7866.	23182.	2857.	7819.	53114.	129091.
1950	9357.	14553.	12627.	153702.	342663.	84192.	206955.	154344.	34570.	36537.	445491.	1012963.
1951	-11119.	-20203.	-20667.	-174711.	-322815.	-119861.	-235128.	-273497.	-57672.	-51989.	-626486.	-1235672.
1952	-4650.	-8480.	-5907.	-74120.	-79546.	-3015.	-95790.	30349.	-13777.	-19037.	-68456.	-254596.
1953	1013.	3323.	1623.	54529.	84981.	-4930.	36985.	18231.	19869.	5961.	50288.	215626.
1954	310.	2264.	2689.	10484.	73838.	4814.	66960.	10831.	8882.	5270.	82605.	181078.
1955	2461.	5030.	4432.	44919.	82141.	37496.	79322.	57939.	11190.	11923.	174757.	324930.
1956	770.	732.	1469.	2901.	44867.	-6696.	50803.	47752.	22855.	2971.	91859.	165452.
1957	109.	959.	108.	-4103.	42391.	22030.	-40879	43334.	-1477.	1236.	61277.	99323.
1958	1227.	3721.	2206.	11788.	98795.	-19850.	11971.	-4957.	14438.	7156.	-12836.	119341.
1959	-3224.	-5819.	-5884.	-40643.	-137346.	25757.	49411.	42367.	1834.	-14927.	117535.	-73547.
1960	-949.	500.	1189.	-3488.	53416.	16450.	33949.	19945.	-312.	739.	70344.	120699.
1961	972.	-1321.	-2407.	-8344.	48423.	20218.	139319.	105600.	10586.	-2756.	265037.	312945.
1962	-1991.	-3518.	-4060.	-25685.	-66268.	20051.	235939.	79064.	-5734.	-9568.	335054.	227736.
1963	-585.	-275.	97.	-6814.	75986.	40575.	343867.	103365.	-1037.	-767.	367807.	456174.
1964	1366.	1206.	375.	21320.	86652.	47357.	259852.	151115.	11282.	2947.	458325.	562725.

GAIN OR LOSS FROM TOTAL AGRICULTURAL ASSETS 1926-64

REAL GAIN (FARM LIVING)-AGGREGATE-

-THOUSANDS OF DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1926	-3079.	345.	-2436.	42812.	38685.	-14345.	64837.	61961.	16564.	-5170.	112452.	205343.
1927	4691.	1903.	6902.	8463.	26109.	16002.	72297.	27121.	8324.	13496.	115419.	171811.
1928	1020.	6075.	10756.	32223.	9553.	-1145.	-38699.	20469.	4987.	17851.	-19375.	45239.
1929	-3140.	-13620.	-14021.	-98916.	-156602.	-46213.	-122535.	-76044.	-22359.	-30781.	-244792.	-553450.
1930	-7411.	-7004.	-8346.	-107397.	-131540.	-65153.	-157395.	-137383.	-12487.	-22761.	-359981.	-634116.
1931	922.	3034.	1477.	18268.	-29586.	-8439.	-60303.	-39907.	-6568.	5433.	-108649.	-121081.
1932	4547.	5136.	7114.	45877.	83228.	21464.	67504.	18053.	7584.	16798.	107001.	280408.
1933	5547.	9140.	7653.	32009.	133331.	29641.	48298.	34786.	3809.	22339.	112725.	304212.
1934	-2919.	3412.	-398.	60217.	-10366.	-2486.	19733.	-5823.	-4162.	95.	11425.	57168.
1935	2109.	10005.	8412.	4911.	72220.	-3986.	-55223.	10330.	6306.	20527.	-48879.	55086.
1936	3709.	1766.	1641.	39450.	66933.	22515.	27519.	19025.	2914.	7115.	69059.	185472.
1937	-2549.	-11105.	-5670.	-48009.	-100261.	-28884.	-48115.	-61690.	-6269.	-19324.	-138689.	-312552.
1938	1347.	8152.	6017.	50156.	50587.	18086.	21345.	38973.	3980.	15517.	78404.	198644.
1939	1268.	1508.	444.	39001.	66546.	5239.	38218.	31086.	4304.	3219.	74543.	187693.
1940	756.	2724.	984.	32356.	-28612.	-1544.	-72426.	-21763.	-2854.	4464.	-95733.	-90379.
1941	2839.	4519.	7940.	45208.	53041.	15152.	38490.	35225.	5793.	15297.	88867.	208206.
1942	-2303.	-2167.	178.	-12443.	30144.	11036.	-9603.	25715.	-652.	-4292.	27148.	39006.
1943	618.	3629.	5400.	-28497.	-24300.	9541.	70624.	20575.	4397.	9646.	100741.	61988.
1944	-828.	-3536.	-3714.	-36479.	-57523.	6230.	27391.	16758.	3917.	-8078.	50379.	-47785.
1945	-182.	1220.	-719.	17426.	27607.	48222.	51666.	37150.	8219.	320.	137037.	190609.
1946	3304.	5398.	6888.	26139.	71495.	27504.	83344.	109716.	13082.	15591.	220565.	346872.
1947	4219.	8905.	4730.	48003.	97286.	80105.	104776.	153922.	13056.	15854.	338803.	513002.
1948	-8009.	-15764.	-15845.	-170997.	-204762.	-72691.	-217754.	-145957.	-33419.	-39618.	-436401.	-885197.
1949	-851.	-1275.	2093.	13091.	-18078.	12976.	-12112.	5171.	-1270.	-34.	6036.	-256.
1950	8515.	12978.	10974.	140244.	319692.	80371.	198616.	146930.	32864.	32466.	425917.	951104.
1951	-10609.	-19310.	-19743.	-166532.	-307914.	-116710.	-228286.	-267351.	-56267.	-49662.	-612347.	-1192722.
1952	-4695.	-8563.	-5990.	-74874.	-80882.	930.	-86970.	37914.	-12044.	-19249.	-48126.	-235175.
1953	45.	1586.	-154.	38579.	55196.	-9317.	27568.	9210.	17959.	1477.	27461.	140668.
1954	-167.	1400.	1809.	2412.	58599.	2088.	60923.	5170.	7581.	3042.	68160.	139814.
1955	3473.	6839.	6275.	61792.	115672.	39784.	84665.	62758.	12335.	16588.	187207.	393594.
1956	934.	1017.	1761.	5678.	50354.	-9534.	44142.	41803.	21432.	3712.	76410.	157585.
1957	445.	1530.	751.	1525.	53983.	26370.	6316.	52784.	880.	2725.	85470.	144983.
1958	315.	2255.	692.	-3551.	65841.	-10558.	34129.	16133.	19550.	3261.	39704.	124805.
1959	-2416.	-4562.	-4611.	-27254.	-107189.	30275.	60622.	53042.	4569.	-11590.	143939.	2475.
1960	-787.	749.	1439.	-771.	59392.	21558.	46606.	32008.	2699.	1401.	100171.	162891.
1961	1209.	-962.	-2050.	-4345.	57634.	18695.	135440.	102014.	9715.	-1802.	256149.	317349.
1962	-1657.	-3031.	-3587.	-20154.	-53191.	19100.	233498.	76773.	-6282.	-8274.	329371.	241470.
1963	340.	1056.	1378.	9788.	112185.	41362.	246009.	105282.	-603.	2774.	392653.	515797.
1964	773.	354.	-451.	11549.	64606.	55688.	283250.	171269.	15593.	676.	510207.	602632.

REAL WEALTH GAIN OR LOSS FROM TOTAL AGRICULTURAL ASSETS 1926-64

REAL GAIN (URBAN LIVING)-AGGREGATE-

-THOUSANDS OF DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1926	-4895.	-3261.	-6233.	13306.	-8705.	-34230.	13880.	31616.	9933.	-14390.	11266.	11410.
1927	5365.	3230.	8292.	19388.	43752.	21986.	87424.	36413.	10309.	16888.	145823.	236160.
1928	310.	4688.	9308.	20819.	-8744.	-10187.	-61419.	6423.	1939.	14306.	-65183.	-36883.
1929	-5295.	-17828.	-18415.	-133987.	-211838.	-65401.	-170822.	-106413.	-28920.	-41538.	-342636.	-758920.
1930	-10828.	-12779.	-13936.	-157909.	-208922.	-74686.	-187043.	-158213.	-16437.	-37543.	-419942.	-840752.
1931	13.	1366.	-156.	4603.	-51283.	-2991.	-42470.	-27705.	-4057.	1223.	-73166.	-122680.
1932	6309.	8547.	10345.	72927.	122160.	32173.	101932.	41498.	12575.	25201.	178603.	408466.
1933	6149.	10211.	8724.	40762.	146417.	38036.	75826.	52711.	7719.	25084.	166573.	386555.
1934	-1770.	5410.	1555.	78616.	15002.	-108.	27390.	-846.	-3108.	5195.	26436.	119140.
1935	1670.	9124.	7597.	-1830.	61538.	-6190.	-62823.	5656.	5349.	18391.	-63357.	20091.
1936	3484.	1269.	1187.	36239.	61224.	16927.	9058.	6627.	251.	5940.	32612.	136266.
1937	-1683.	-9421.	-4116.	-35953.	-78909.	-23354.	-31940.	-50171.	-3836.	-15220.	-105465.	-239382.
1938	142.	6070.	3888.	34233.	22851.	11116.	1587.	24626.	717.	10100.	37329.	104730.
1939	568.	149.	-894.	28959.	49218.	-147.	24464.	20225.	2045.	-177.	44542.	124588.
1940	2315.	5620.	3789.	56506.	13242.	14043.	-32897.	11687.	4096.	11724.	-7167.	78401.
1941	2860.	4559.	7976.	45543.	53579.	11011.	27572.	25942.	3962.	15395.	64524.	183033.
1942	-85.	1927.	4227.	23738.	85681.	10153.	-11917.	23890.	-1057.	6069.	22127.	136568.
1943	3058.	8316.	10296.	14766.	44001.	13796.	81186.	29398.	6337.	21670.	124380.	211354.
1944	910.	-63.	-26.	-7280.	-11337.	9623.	36330.	23861.	5548.	821.	69815.	57567.
1945	546.	2610.	747.	29127.	46176.	46895.	48169.	34392.	7549.	3903.	129456.	216211.
1946	3211.	5212.	6700.	24539.	68986.	24939.	77097.	104813.	11641.	15124.	206849.	327339.
1947	3567.	5615.	3399.	37145.	79959.	78515.	100863.	150707.	12269.	12581.	330086.	472040.
1948	-7001.	-13841.	-13898.	-154543.	-177891.	-48722.	-162490.	-98003.	-22573.	-34739.	-309215.	-698960.
1949	882.	1915.	5361.	39779.	28553.	41445.	50451.	61576.	11685.	8158.	153472.	241647.
1950	9640.	15081.	18182.	158215.	350367.	86418.	211814.	158664.	35565.	37902.	456897.	1038945.
1951	-11940.	-21641.	-22152.	-187872.	-346795.	-114733.	-223990.	-263492.	-55385.	-55733.	-602214.	-1247999.
1952	-1919.	-3530.	-905.	-28685.	556.	29498.	-23095.	92699.	509.	-6353.	99103.	64930.
1953	-419.	755.	-1004.	30946.	40952.	-29308.	-15344.	-31904.	9252.	-668.	-76557.	3926.
1954	-864.	153.	539.	-9233.	36615.	1869.	60438.	4716.	7477.	-171.	67023.	101711.
1955	2954.	5911.	5329.	53134.	98467.	33920.	70972.	50407.	9401.	14194.	155299.	330494.
1956	1827.	2567.	3350.	20801.	80231.	-19630.	20446.	20638.	16369.	7744.	21454.	146599.
1957	611.	1813.	1040.	4318.	59737.	32233.	20372.	65551.	4064.	3464.	116155.	189768.
1958	-38.	1687.	104.	-9491.	53079.	-21468.	8112.	-8630.	13547.	1753.	-21987.	36900.
1959	-1152.	-2596.	-2620.	-o304.	-60002.	31028.	62490.	54821.	5024.	-6368.	148338.	80688.
1960	-66.	1861.	2555.	11333.	86029.	14430.	28945.	15175.	-1502.	4349.	58550.	158750.
1961	1793.	-75.	-1168.	5514.	80347.	21389.	142120.	108354.	11255.	550.	271863.	369529.
1962	-362.	-1144.	-1755.	1270.	-2538.	28507.	257641.	99442.	-864.	-3262.	385591.	380197.
1963	1146.	2212.	2491.	23343.	143634.	63747.	306907.	159772.	11735.	5849.	530426.	714987.
1964	2151.	2334.	1469.	34717.	120481.	51707.	272068.	161637.	13533.	5954.	485412.	660097.

TABLE IXVIII

REAL WEALTH GAIN OR LOSS FROM TOTAL AGRICULTURAL ASSETS 1931-64

QUANTITY COMPONENT A -PER OPERATOR-

-DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1931	4.	152.	112.	95.	-264.	-190.	-155.	-218.	18.	105.	-183.	-100.
1932	-8.	-159.	-84.	-150.	-28.	-178.	-52.	-104.	-92.	-101.	-96.	-92.
1933	-89.	-119.	-182.	-226.	-132.	-337.	-270.	-310.	-296.	-135.	-297.	-222.
1934	-332.	-99.	-196.	-358.	-318.	-138.	214.	-76.	-159.	-182.	43.	-172.
1935	-180.	-34.	-44.	-366.	-181.	-217.	-383.	-190.	-23.	-66.	-284.	-246.
1936	-126.	-312.	-295.	-180.	-328.	-46.	-682.	-221.	-229.	-271.	-593.	-307.
1937	91.	-96.	58.	-50.	-1.	37.	-443.	-19.	156.	-1.	-200.	-83.
1938	-191.	10.	-29.	-54.	-67.	148.	-291.	23.	-127.	-40.	-93.	-73.
1939	-321.	-307.	-304.	-179.	-294.	-109.	-347.	82.	-55.	-308.	-153.	-208.
1940	-222.	-170.	-230.	-282.	-585.	-274.	488.	210.	-286.	-204.	263.	-149.
1941	-133.	-139.	-23.	17.	-208.	53.	33.	-599.	409.	-88.	-176.	-108.
1942	85.	147.	301.	474.	668.	489.	396.	640.	751.	702.	499.	512.
1943	-72.	29.	48.	-181.	-433.	-142.	18.	-90.	404.	20.	-53.	-149.
1944	90.	-68.	-99.	-30.	-17.	115.	51.	15.	575.	-53.	52.	24.
1945	-118.	26.	-111.	127.	81.	276.	43.	25.	488.	-58.	87.	98.
1946	-39.	-23.	32.	-54.	-92.	28.	14.	89.	302.	-4.	43.	-10.
1947	-378.	-514.	-509.	-463.	-645.	-297.	-486.	-449.	-338.	-485.	-432.	-493.
1948	92.	-109.	-45.	-53.	217.	327.	108.	244.	344.	-41.	205.	147.
1949	94.	190.	196.	215.	336.	344.	646.	224.	251.	172.	427.	320.
1950	40.	-328.	-321.	23.	596.	85.	-242.	358.	155.	-243.	49.	164.
1951	37.	401.	170.	345.	133.	502.	1001.	723.	316.	227.	788.	441.
1952	-51.	-166.	-216.	-162.	296.	680.	810.	2290.	785.	-158.	1329.	538.
1953	30.	-69.	6.	-69.	186.	-403.	-257.	-627.	348.	-16.	-428.	-106.
1954	26.	-74.	-93.	-25.	547.	87.	878.	471.	606.	-56.	546.	357.
1955	-181.	-559.	-457.	-94.	-246.	-336.	-191.	-282.	28.	-424.	-258.	-210.
1956	-137.	-335.	-433.	-183.	262.	-24.	-277.	241.	493.	-319.	-33.	15.
1957	172.	-543.	-337.	271.	1253.	148.	834.	1714.	826.	-275.	1015.	794.
1958	202.	-331.	-487.	107.	989.	-101.	404.	613.	1121.	-244.	369.	493.
1959	39.	-2.	-134.	108.	-87.	573.	1047.	1092.	316.	-38.	955.	350.
1960	-96.	-531.	-714.	-130.	654.	551.	1011.	927.	19.	-470.	871.	410.
1961	124.	-192.	-437.	70.	434.	-209.	-61.	-125.	61.	-185.	-121.	58.
1962	193.	31.	-37.	397.	298.	1237.	2262.	1759.	315.	56.	1822.	810.
1963	9.	-44.	46.	-40.	564.	1375.	2193.	1465.	3.	4.	1708.	717.
1964	-46.	-11.	159.	266.	576.	2047.	5593.	2520.	1167.	37.	3510.	1498.

TABLE LXIX

REAL WEALTH GAIN OR LOSS FROM TOTAL AGRICULTURAL ASSETS 1931-64

QUANTITY COMPONENT B -PER OPERATOR-

-DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1931	2.	143.	99.	87.	-304.	-210.	-190.	-235.	10.	97.	-209.	-123.
1932	-14.	-194.	-94.	-176.	-56.	-199.	-72.	-145.	-109.	-121.	-123.	-118.
1933	-115.	-162.	-218.	-265.	-180.	-391.	-310.	-338.	-335.	-172.	-337.	-243.
1934	-383.	-169.	-231.	-561.	-389.	-147.	193.	-80.	-168.	-235.	30.	-249.
1935	-202.	-39.	-49.	-442.	-207.	-268.	-465.	-206.	-40.	-74.	-337.	-292.
1936	-132.	-385.	-350.	-195.	-354.	-52.	-765.	-240.	-263.	-324.	-439.	-342.
1937	64.	-100.	42.	-61.	-10.	33.	-489.	-23.	134.	-14.	-223.	-98.
1938	-220.	7.	-36.	-65.	-106.	124.	-350.	5.	-138.	-49.	-131.	-100.
1939	-369.	-386.	-385.	-195.	-315.	-126.	-380.	58.	-71.	-383.	-180.	-233.
1940	-306.	-217.	-295.	-354.	-692.	-357.	298.	-36.	-344.	-265.	47.	-271.
1941	-183.	-161.	-25.	11.	-243.	43.	25.	-810.	375.	-106.	-253.	-150.
1942	23.	101.	202.	354.	552.	405.	309.	505.	673.	131.	396.	405.
1943	-77.	26.	38.	-202.	-468.	-153.	12.	-93.	379.	13.	-60.	-166.
1944	78.	-77.	-112.	-43.	-38.	67.	-26.	-46.	526.	-63.	-13.	-12.
1945	-128.	21.	-118.	121.	70.	157.	-7.	-19.	429.	-65.	25.	67.
1946	-55.	-30.	20.	-59.	-104.	15.	-5.	55.	275.	-16.	21.	-24.
1947	-439.	-614.	-608.	-543.	-738.	-382.	-597.	-538.	-431.	-576.	-529.	-585.
1948	64.	-112.	-47.	-71.	196.	278.	58.	192.	331.	-49.	154.	97.
1949	87.	173.	178.	201.	307.	195.	546.	140.	208.	157.	321.	268.
1950	-10.	-373.	-369.	11.	485.	5.	-336.	195.	81.	-291.	-67.	80.
1951	32.	320.	152.	288.	126.	473.	920.	644.	296.	188.	719.	395.
1952	-110.	-222.	-250.	-203.	202.	589.	719.	1967.	731.	-207.	1152.	433.
1953	22.	-87.	-21.	-92.	165.	-446.	-323.	-681.	321.	-35.	-464.	-140.
1954	19.	-93.	-111.	-30.	499.	39.	766.	416.	565.	-72.	470.	313.
1955	-194.	-598.	-480.	-103.	-280.	-393.	-262.	-327.	19.	-450.	-316.	-243.
1956	-148.	-358.	-460.	-189.	248.	-52.	-285.	200.	454.	-340.	-58.	-2.
1957	148.	-598.	-380.	233.	1091.	10.	702.	1536.	737.	-318.	864.	671.
1958	187.	-427.	-519.	100.	912.	-143.	375.	584.	1035.	-294.	337.	449.
1959	38.	-8.	-142.	103.	-87.	541.	992.	1030.	310.	-43.	903.	330.
1960	-99.	-565.	-768.	-141.	572.	508.	937.	870.	5.	-502.	811.	362.
1961	113.	-204.	-472.	64.	422.	-230.	-141.	-194.	58.	-205.	-183.	60.
1962	183.	24.	-48.	376.	250.	1146.	2030.	1620.	280.	47.	1659.	745.
1963	-2.	-47.	43.	-47.	549.	1284.	2038.	1374.	-21.	-2.	1594.	671.
1964	-53.	-50.	110.	238.	515.	1684.	4803.	2034.	1030.	4.	2944.	1264.

TABLE LXX

REAL WEALTH GAIN OR LOSS FROM TOTAL AGRICULTURAL ASSETS 1931-64

ESTIMATED QUANTITY COMPONENT-PER OPERATOR-

-DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1931	3.	147.	106.	91.	-284.	-200.	-172.	-227.	14.	101.	-196.	-112.
1932	-11.	-177.	-89.	-163.	-42.	-188.	-62.	-124.	-101.	-111.	-110.	-105.
1933	-102.	-140.	-200.	-245.	-156.	-364.	-290.	-324.	-316.	-154.	-317.	-242.
1934	-358.	-134.	-213.	-460.	-354.	-142.	203.	-78.	-164.	-208.	37.	-211.
1935	-191.	-36.	-47.	-404.	-194.	-242.	-424.	-198.	-32.	-70.	-310.	-269.
1936	-129.	-348.	-323.	-188.	-341.	-49.	-723.	-230.	-246.	-298.	-416.	-324.
1937	77.	-98.	50.	-56.	-5.	35.	-466.	-21.	145.	-7.	-211.	-90.
1938	-205.	9.	-33.	-59.	-87.	136.	-320.	14.	-132.	-45.	-112.	-87.
1939	-345.	-347.	-344.	-187.	-304.	-118.	-363.	70.	-63.	-345.	-166.	-220.
1940	-264.	-194.	-263.	-318.	-639.	-315.	393.	87.	-315.	-234.	140.	-210.
1941	-158.	-150.	-24.	14.	-225.	48.	29.	-704.	392.	-97.	-214.	-129.
1942	54.	124.	252.	414.	610.	447.	352.	573.	712.	167.	448.	459.
1943	-75.	28.	43.	-191.	-461.	-147.	15.	-91.	301.	16.	-56.	-158.
1944	84.	-72.	-105.	-37.	-27.	91.	13.	-16.	551.	-58.	20.	6.
1945	-123.	24.	-114.	124.	76.	217.	18.	3.	459.	-61.	56.	82.
1946	-52.	-27.	26.	-57.	-98.	21.	4.	72.	288.	-10.	32.	-17.
1947	-408.	-564.	-559.	-503.	-691.	-340.	-542.	-494.	-384.	-530.	-480.	-539.
1948	78.	-111.	-46.	-62.	206.	302.	83.	218.	337.	-45.	180.	112.
1949	91.	182.	187.	208.	322.	269.	596.	182.	229.	164.	374.	294.
1950	15.	-351.	-345.	22.	541.	45.	-289.	276.	118.	-267.	-9.	121.
1951	55.	360.	161.	316.	130.	488.	960.	684.	306.	208.	753.	418.
1952	-80.	-194.	-238.	-183.	249.	634.	764.	2129.	758.	-182.	1241.	495.
1953	26.	-78.	-8.	-80.	176.	-425.	-290.	-654.	334.	-26.	-456.	-123.
1954	23.	-84.	-102.	-28.	523.	83.	322.	443.	585.	-64.	508.	335.
1955	-188.	-578.	-468.	-99.	-264.	-364.	-226.	-304.	23.	-437.	-287.	-227.
1956	-141.	-340.	-447.	-186.	255.	-38.	-281.	221.	474.	-330.	-45.	6.
1957	160.	-571.	-359.	252.	1172.	79.	768.	1625.	782.	-297.	940.	727.
1958	194.	-379.	-503.	103.	951.	-122.	390.	599.	1078.	-269.	353.	471.
1959	38.	-5.	-138.	105.	-87.	557.	1019.	1061.	313.	-41.	929.	840.
1960	-97.	-548.	-740.	-136.	613.	529.	974.	899.	12.	-486.	841.	336.
1961	118.	-198.	-454.	67.	428.	-220.	-101.	-160.	59.	-195.	-152.	74.
1962	168.	27.	-43.	386.	254.	1192.	2146.	1689.	298.	52.	1740.	777.
1963	3.	-45.	44.	-43.	556.	1329.	2119.	1420.	-9.	1.	1651.	634.
1964	-49.	-30.	134.	252.	545.	1865.	5198.	2277.	1099.	21.	3227.	1377.

TABLE LXXI

REAL WEALTH GAIN OR LOSS FROM TOTAL AGRICULTURAL ASSETS 1931-64

ESTIMATED PRICE COMPONENT-PER OPERATOR-

-DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1931	-404.	-330.	-499.	-621.	-1318.	-904.	-1748.	-1654.	-1263.	-403.	-1534.	-1130.
1932	104.	-27.	66.	-8.	105.	34.	37.	-356.	-92.	33.	-92.	-8.
1933	254.	192.	173.	26.	592.	448.	239.	261.	29.	198.	291.	284.
1934	-70.	220.	110.	554.	198.	84.	377.	109.	-55.	121.	225.	277.
1935	140.	309.	294.	20.	417.	-72.	-474.	123.	300.	271.	-191.	74.
1936	313.	106.	106.	295.	499.	403.	244.	232.	140.	144.	274.	315.
1937	-5.	-189.	-38.	-75.	-219.	-218.	-15.	-311.	29.	-96.	-156.	-139.
1938	53.	207.	145.	225.	194.	235.	88.	330.	99.	155.	200.	197.
1939	12.	-18.	-46.	118.	209.	-44.	127.	145.	35.	-25.	97.	114.
1940	332.	271.	201.	444.	345.	433.	3.	405.	398.	250.	229.	317.
1941	519.	355.	432.	546.	796.	576.	711.	834.	614.	416.	724.	662.
1942	236.	268.	343.	436.	1053.	587.	352.	805.	354.	295.	556.	611.
1943	406.	444.	505.	231.	537.	434.	994.	575.	514.	463.	729.	532.
1944	116.	24.	26.	-14.	-22.	243.	429.	366.	304.	41.	367.	145.
1945	79.	140.	58.	220.	360.	975.	541.	484.	366.	94.	615.	396.
1946	428.	374.	417.	340.	733.	763.	1095.	1538.	839.	402.	1179.	771.
1947	776.	733.	626.	813.	1447.	2462.	2222.	2975.	1365.	698.	2542.	1615.
1948	225.	210.	209.	29.	497.	881.	576.	1086.	725.	213.	825.	483.
1949	254.	274.	417.	440.	534.	1203.	996.	1225.	734.	327.	1124.	717.
1950	946.	887.	770.	1126.	2448.	1993.	2576.	2251.	1477.	853.	2328.	1891.
1951	-173.	-222.	-211.	-181.	-362.	-198.	51.	-734.	-302.	-206.	-292.	-275.
1952	18.	17.	169.	42.	433.	1152.	341.	1820.	378.	76.	1070.	531.
1953	-110.	-34.	-142.	133.	131.	-862.	-431.	-681.	195.	-94.	-621.	-150.
1954	-33.	67.	90.	-5.	356.	166.	902.	218.	341.	51.	479.	255.
1955	304.	420.	370.	394.	732.	816.	900.	741.	353.	372.	856.	641.
1956	323.	361.	415.	312.	903.	-127.	726.	782.	813.	371.	852.	584.
1957	374.	535.	469.	394.	1194.	1610.	1434.	2017.	730.	467.	1698.	1064.
1958	279.	501.	357.	252.	1121.	134.	991.	715.	1061.	388.	687.	736.
1959	-10.	-90.	-89.	96.	-165.	1194.	1560.	1364.	449.	-67.	1399.	484.
1960	132.	365.	432.	262.	1076.	793.	1095.	784.	223.	322.	902.	701.
1961	350.	142.	21.	182.	987.	942.	3101.	2296.	623.	161.	2279.	1141.
1962	109.	66.	-13.	190.	383.	1315.	5821.	2426.	260.	51.	3412.	1318.
1963	414.	606.	621.	510.	1925.	2728.	7557.	3966.	856.	552.	4977.	2421.
1964	578.	683.	541.	640.	1794.	2445.	7179.	4123.	946.	601.	4823.	2380.

TABLE LXXII

REAL WEALTH GAIN OR LOSS FROM TOTAL AGRICULTURAL ASSETS 1931-64

COMPOSITE FARM COST COMPENSATION-PER OPERATOR-

-DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	NFLD.	PR.	CANADA
1931	-496.	-467.	-606.	-807.	-1181.	-765.	-1188.	-1138.	-935.	-520.	-1080.	-975.
1932	-290.	-284.	-341.	-466.	-628.	-402.	-613.	-586.	-494.	-306.	-558.	-524.
1933	-86.	-74.	-90.	-120.	-173.	-126.	-197.	-179.	-156.	-82.	-175.	-151.
1934	226.	183.	211.	279.	443.	138.	211.	193.	161.	202.	188.	273.
1935	4.	3.	3.	5.	8.	12.	20.	17.	14.	3.	17.	10.
1936	76.	73.	73.	90.	159.	28.	43.	40.	33.	73.	39.	84.
1937	286.	236.	228.	312.	558.	253.	350.	341.	278.	242.	326.	368.
1938	-142.	-99.	-102.	-138.	-246.	-40.	-53.	-53.	-49.	-107.	-50.	-125.
1939	-98.	-75.	-72.	-99.	-178.	-130.	-155.	-166.	-146.	-77.	-154.	-138.
1940	337.	235.	215.	341.	624.	500.	596.	684.	560.	242.	605.	505.
1941	365.	270.	231.	381.	643.	340.	427.	484.	388.	269.	428.	449.
1942	542.	414.	389.	604.	967.	336.	426.	439.	366.	425.	411.	591.
1943	358.	297.	294.	455.	752.	144.	174.	187.	170.	306.	172.	387.
1944	67.	61.	61.	79.	129.	56.	76.	76.	63.	62.	72.	86.
1945	117.	106.	107.	131.	216.	37.	48.	47.	39.	108.	45.	114.
1946	154.	151.	146.	186.	300.	311.	384.	366.	345.	150.	362.	281.
1947	452.	463.	456.	591.	896.	898.	1135.	1119.	944.	458.	1078.	833.
1948	963.	987.	961.	1137.	1902.	2171.	2614.	2692.	1833.	971.	2544.	1858.
1949	188.	192.	188.	210.	373.	769.	918.	958.	638.	190.	804.	521.
1950	152.	167.	168.	177.	307.	359.	420.	424.	284.	164.	408.	298.
1951	820.	864.	865.	968.	1776.	2294.	2705.	2715.	1757.	955.	2617.	1798.
1952	457.	519.	507.	553.	986.	1219.	1501.	1416.	870.	500.	1408.	972.
1953	-208.	-241.	-240.	-251.	-468.	-750.	-901.	-930.	-514.	-233.	-878.	-542.
1954	-63.	-75.	-74.	-76.	-143.	62.	78.	77.	45.	-72.	74.	-33.
1955	62.	77.	77.	75.	150.	-44.	-59.	-55.	-33.	73.	-54.	43.
1956	242.	305.	306.	291.	570.	36.	46.	47.	25.	289.	44.	262.
1957	362.	457.	455.	426.	871.	1053.	1495.	1366.	781.	431.	1344.	864.
1958	135.	166.	165.	156.	331.	579.	829.	781.	527.	158.	753.	481.
1959	383.	475.	472.	438.	970.	474.	718.	663.	381.	448.	640.	647.
1960	250.	315.	313.	292.	627.	320.	491.	446.	234.	295.	433.	427.
1961	224.	287.	283.	255.	573.	351.	546.	484.	245.	267.	476.	417.
1962	382.	490.	470.	427.	974.	696.	1130.	978.	473.	450.	966.	761.
1963	497.	641.	609.	565.	1241.	1440.	2539.	2048.	893.	586.	2083.	1284.
1964	383.	520.	491.	433.	988.	936.	1731.	1320.	543.	467.	1377.	913.

TABLE LXXIII

REAL WEALTH GAIN OR LOSS FROM TOTAL AGRICULTURAL ASSETS 1931-64

FARM LIVING COST COMPENSATION-PER OPERATOR-

-DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1931	-469.	-439.	-569.	-759.	-1111.	-717.	-1114.	-1066.	-876.	-489.	-1012.	-915.
1932	-214.	-205.	-246.	-335.	-454.	-418.	-637.	-609.	-514.	-221.	-580.	-448.
1933	-137.	-117.	-143.	-191.	-274.	-138.	-216.	-196.	-171.	-130.	-192.	-205.
1934	134.	108.	125.	166.	263.	131.	199.	183.	153.	120.	178.	189.
1935	-7.	-7.	-7.	-10.	-15.	0.	0.	0.	0.	-7.	0.	-7.
1936	53.	52.	51.	64.	112.	11.	17.	16.	13.	52.	15.	54.
1937	176.	145.	140.	192.	344.	264.	365.	357.	290.	149.	341.	283.
1938	-45.	-31.	-32.	-44.	-78.	-55.	-73.	-73.	-67.	-34.	-69.	-61.
1939	-80.	-61.	-58.	-81.	-145.	-124.	-149.	-160.	-140.	-63.	-148.	-121.
1940	271.	189.	173.	275.	503.	458.	546.	626.	513.	196.	554.	434.
1941	259.	191.	164.	270.	456.	296.	372.	421.	338.	191.	373.	347.
1942	469.	358.	336.	522.	836.	354.	449.	463.	386.	367.	434.	543.
1943	344.	285.	282.	437.	721.	240.	291.	312.	283.	294.	287.	424.
1944	195.	177.	178.	228.	375.	117.	153.	155.	126.	181.	145.	224.
1945	96.	87.	87.	108.	177.	22.	29.	28.	23.	89.	27.	89.
1946	154.	152.	147.	187.	302.	264.	327.	311.	294.	151.	308.	260.
1947	433.	443.	436.	528.	857.	956.	1209.	1192.	899.	438.	1148.	843.
1948	876.	898.	875.	1035.	1731.	2224.	2678.	2758.	1878.	884.	2606.	1806.
1949	324.	332.	325.	362.	644.	960.	1117.	1165.	776.	327.	1099.	717.
1950	224.	245.	247.	261.	430.	433.	507.	512.	343.	241.	492.	395.
1951	774.	816.	817.	914.	1677.	2229.	2628.	2637.	1707.	807.	2543.	1726.
1952	461.	524.	511.	568.	995.	1132.	1394.	1315.	808.	504.	1307.	947.
1953	-115.	-133.	-133.	-138.	-258.	-650.	-781.	-807.	-446.	-128.	-761.	-406.
1954	-17.	-21.	-21.	-21.	-40.	121.	152.	151.	89.	-20.	145.	39.
1955	-37.	-46.	-45.	-44.	-80.	-96.	-130.	-122.	-73.	-43.	-119.	-84.
1956	225.	283.	284.	270.	530.	104.	135.	139.	74.	268.	129.	278.
1957	326.	410.	409.	388.	782.	944.	1339.	1224.	700.	387.	1204.	793.
1958	242.	298.	297.	281.	594.	371.	531.	500.	337.	283.	482.	470.
1959	265.	353.	350.	325.	721.	348.	527.	487.	279.	333.	470.	479.
1960	230.	290.	288.	269.	577.	173.	266.	241.	127.	272.	235.	332.
1961	192.	248.	244.	220.	494.	395.	615.	546.	276.	230.	537.	406.
1962	336.	431.	414.	376.	858.	720.	1179.	1020.	493.	396.	1008.	728.
1963	367.	473.	449.	417.	915.	1415.	2495.	2013.	877.	432.	2047.	1132.
1964	466.	635.	600.	529.	1206.	671.	1241.	946.	389.	570.	987.	862.

TABLE LXXIV

REAL WEALTH GAIN OR LOSS FROM TOTAL AGRICULTURAL ASSETS 1931-64

URBAN LIVING COST COMPENSATION-PER OPERATOR-

-DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1931	-405.	-379.	-492.	-656.	-959.	-837.	-1301.	-1246.	-1024.	-422.	-1183.	-913.
1932	-337.	-323.	-388.	-529.	-715.	-648.	-981.	-937.	-791.	-348.	-894.	-698.
1933	-179.	-153.	-187.	-250.	-359.	-304.	-475.	-431.	-377.	-171.	-423.	-337.
1934	54.	43.	50.	66.	105.	86.	131.	120.	100.	48.	117.	94.
1935	24.	21.	22.	32.	49.	40.	65.	56.	46.	22.	57.	45.
1936	69.	67.	67.	83.	145.	108.	169.	157.	129.	67.	152.	124.
1937	115.	95.	91.	125.	224.	172.	237.	232.	189.	97.	222.	184.
1938	43.	30.	31.	42.	74.	57.	76.	75.	69.	32.	72.	61.
1939	-29.	-22.	-21.	-29.	-53.	-41.	-50.	-53.	-47.	-23.	-49.	-42.
1940	147.	102.	94.	149.	272.	209.	250.	286.	235.	105.	253.	216.
1941	257.	190.	163.	268.	453.	373.	468.	530.	425.	189.	469.	385.
1942	245.	187.	175.	272.	436.	373.	473.	487.	407.	192.	456.	378.
1943	97.	81.	80.	124.	204.	153.	186.	200.	181.	83.	184.	164.
1944	29.	27.	27.	34.	57.	48.	63.	63.	51.	27.	59.	49.
1945	29.	26.	27.	33.	54.	48.	63.	62.	51.	27.	60.	48.
1946	162.	160.	155.	197.	317.	311.	384.	366.	345.	158.	362.	289.
1947	486.	497.	490.	592.	962.	986.	1247.	1229.	927.	492.	1163.	905.
1948	794.	814.	793.	938.	1569.	1781.	2145.	2208.	1504.	802.	2087.	1528.
1949	182.	186.	182.	203.	361.	426.	495.	517.	344.	184.	488.	351.
1950	129.	140.	142.	150.	259.	315.	369.	373.	250.	138.	359.	257.
1951	893.	941.	943.	1055.	1935.	2187.	2579.	2589.	1676.	931.	2496.	1819.
1952	199.	226.	221.	241.	430.	504.	621.	586.	360.	218.	582.	416.
1953	-70.	-81.	-81.	-85.	-158.	-197.	-237.	-245.	-135.	-78.	-231.	-158.
1954	48.	57.	57.	58.	109.	126.	158.	157.	92.	55.	150.	105.
1955	14.	18.	17.	17.	34.	38.	51.	48.	29.	17.	47.	33.
1956	131.	165.	165.	157.	308.	349.	452.	464.	249.	156.	433.	299.
1957	307.	387.	386.	361.	738.	796.	1129.	1032.	590.	365.	1015.	702.
1958	283.	349.	348.	329.	696.	616.	881.	830.	560.	332.	800.	657.
1959	131.	162.	161.	149.	331.	327.	495.	457.	263.	153.	442.	305.
1960	141.	177.	176.	165.	353.	378.	580.	527.	277.	166.	512.	341.
1961	117.	151.	148.	134.	300.	317.	493.	437.	221.	140.	430.	286.
1962	159.	204.	195.	178.	405.	427.	699.	605.	292.	187.	598.	388.
1963	253.	326.	310.	288.	651.	704.	1242.	1002.	437.	298.	1019.	638.
1964	271.	368.	347.	306.	698.	798.	1475.	1124.	463.	330.	1173.	718.

REAL WEALTH GAIN OR LOSS FROM TOTAL AGRICULTURAL ASSETS 1931-64

REAL GAIN (FARM COSTS)-PER OPERATOR-

-DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1931	95.	137.	106.	187.	-137.	-139.	-560.	-516.	-327.	117.	-454.	-156.
1932	400.	257.	407.	457.	733.	436.	650.	229.	402.	340.	466.	515.
1933	340.	266.	263.	146.	765.	574.	436.	439.	185.	280.	467.	435.
1934	-296.	37.	-101.	275.	-244.	-55.	166.	-84.	-217.	-81.	37.	3.
1935	137.	306.	290.	16.	410.	-84.	-494.	106.	286.	267.	-208.	64.
1936	237.	33.	33.	204.	340.	376.	201.	192.	107.	71.	235.	231.
1937	-291.	-425.	-266.	-386.	-778.	-471.	-364.	-652.	-249.	-337.	-483.	-507.
1938	195.	305.	247.	363.	441.	275.	141.	383.	148.	263.	250.	322.
1939	110.	57.	26.	217.	287.	86.	283.	312.	181.	52.	250.	251.
1940	-5.	36.	-14.	103.	-280.	-67.	-593.	-279.	-162.	8.	-376.	-188.
1941	155.	85.	201.	165.	154.	238.	284.	350.	226.	147.	296.	212.
1942	-306.	-147.	-45.	-167.	86.	251.	-74.	366.	-12.	-130.	146.	20.
1943	48.	147.	211.	-225.	-214.	290.	820.	388.	345.	157.	557.	145.
1944	49.	-37.	-36.	-92.	-151.	185.	352.	290.	241.	-21.	295.	58.
1945	-38.	34.	-49.	88.	144.	938.	493.	437.	327.	-14.	570.	282.
1946	274.	222.	271.	154.	432.	453.	711.	1172.	493.	252.	818.	490.
1947	323.	270.	170.	262.	551.	1564.	1086.	1856.	521.	240.	1464.	782.
1948	-738.	-777.	-752.	-1108.	-1404.	-1291.	-2038.	-1606.	-1108.	-759.	-1719.	-1374.
1949	66.	81.	228.	230.	161.	414.	78.	266.	96.	137.	220.	195.
1950	793.	720.	601.	949.	2142.	1635.	2156.	1827.	1192.	689.	1920.	1593.
1951	-993.	-1086.	-1076.	-1149.	-2138.	-2492.	-2654.	-3449.	-2060.	-1061.	-2910.	-2073.
1952	-439.	-502.	-338.	-511.	-552.	-66.	-1160.	404.	-492.	-423.	-337.	-451.
1953	98.	206.	98.	384.	598.	-112.	469.	249.	710.	139.	257.	391.
1954	30.	142.	164.	71.	499.	104.	825.	141.	296.	123.	405.	316.
1955	241.	342.	293.	319.	583.	860.	1049.	796.	386.	298.	910.	598.
1956	81.	56.	110.	22.	332.	-162.	680.	735.	788.	83.	508.	321.
1957	12.	78.	13.	-32.	324.	556.	-61.	652.	-51.	36.	354.	200.
1958	144.	335.	192.	96.	790.	-445.	161.	-66.	535.	231.	-66.	254.
1959	-393.	-565.	-560.	-242.	-1135.	719.	842.	700.	68.	-515.	758.	-163.
1960	-117.	50.	119.	-30.	449.	473.	604.	338.	-11.	26.	469.	274.
1961	126.	-145.	-262.	-73.	414.	591.	2554.	1811.	378.	-106.	1803.	724.
1962	-273.	-424.	-483.	-238.	-592.	625.	4691..	1448.	-212.	-399.	2446.	557.
1963	-83.	-35.	12.	-55.	665.	1288.	5018.	1918.	-37.	-33.	2894.	1138.
1964	195.	163.	49.	207.	806.	1508.	5448.	2804.	403.	134.	3446.	1468.

TABLE LXXVI

REAL WEALTH GAIN OR LOSS FROM TOTAL AGRICULTURAL ASSETS 1931-64

REAL GAIN (FARM LIVING)-PER OPERATOR-

-DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1931	65.	109.	70.	139.	-207.	-187.	-635.	-588.	-386.	86.	-522.	-215.
1932	318.	178.	312.	328.	559.	452.	674.	253.	421.	255.	489.	440.
1933	391.	309.	316.	216.	866.	586.	455.	457.	200.	329.	484.	489.
1934	-204.	111.	-15.	388.	-65.	-47.	177.	-74.	-208.	1.	47.	88.
1935	148.	316.	300.	30.	432.	-72.	-474.	123.	300.	277.	-191.	81.
1936	259.	54.	55.	231.	387.	392.	226.	216.	127.	92.	259.	261.
1937	-181.	-334.	-179.	-267.	-563.	-482.	-380.	-668.	-261.	-245.	-497.	-422.
1938	98.	236.	178.	268.	272.	289.	161.	402.	166.	189.	269.	258.
1939	92.	43.	12.	199.	354.	81.	277.	305.	175.	38.	244.	235.
1940	60.	82.	28.	169.	-158.	-25.	-542.	-221.	-114.	55.	-325.	-117.
1941	260.	163.	268.	276.	340.	260.	339.	413.	276.	225.	351.	315.
1942	-233.	-91.	7.	-86.	217.	232.	-98.	342.	-33.	-73.	123.	68.
1943	62.	158.	223.	-206.	-184.	194.	703.	263.	231.	169.	442.	108.
1944	-79.	-153.	-152.	-242.	-397.	127.	276.	213.	178.	-139.	222.	-79.
1945	-17.	53.	-30.	112.	183.	953.	512.	456.	342.	6.	588.	306.
1946	273.	221.	270.	153.	431.	499.	768.	1227.	545.	251.	872.	511.
1947	343.	290.	190.	286.	590.	1506.	1012.	1784.	466.	260.	1394.	771.
1948	-651.	-688.	-666.	-1006.	-1234.	-1344.	-2102.	-1672.	-1152.	-671.	-1781.	-1323.
1949	-70.	-58.	91.	78.	-110.	243.	-120.	59.	-42.	-1.	25.	-0.
1950	722.	642.	523.	866.	1998.	1561.	2069.	1739.	1133.	813.	1836.	1496.
1951	-947.	-1038.	-1028.	-1096.	-2039.	-2426.	-2577.	-3371.	-2010.	-1014.	-2835.	-2001.
1952	-443.	-507.	-342.	-516.	-562.	20.	-1053.	505.	-430.	-428.	-237.	-416.
1953	4.	99.	-9.	272.	369.	-211.	350.	126.	641.	34.	140.	255.
1954	-16.	88.	110.	16.	396.	45.	750.	67.	253.	71.	334.	244.
1955	340.	465.	416.	438.	820.	912.	1120.	862.	425.	415.	975.	725.
1956	98.	78.	131.	42.	373.	-231.	591.	643.	739.	103.	422.	306.
1957	49.	124.	60.	12.	412.	666.	94.	794.	30.	80.	494.	291.
1958	37.	203.	60.	-29.	527.	-237.	459.	215.	724.	105.	205.	266.
1959	-295.	-443.	-439.	-229.	-886.	846.	1033.	877.	169.	-400.	929.	5.
1960	-97.	76.	144.	-7.	499.	619.	829.	543.	96.	50.	668.	369.
1961	157.	-106.	-223.	-38.	493.	547.	2485.	1750.	347.	-69.	1743.	735.
1962	-427.	-365.	-427.	-187.	-475.	595.	4642.	1406.	-233.	-345.	2404.	590.
1963	48.	134.	172.	93.	1011.	1313.	5062.	1953.	-22.	121.	2930.	1289.
1964	110.	48.	-59.	111.	587.	1774.	5938.	3178.	557.	81.	3836.	1518.

TABLE LXXVII

REAL WEALTH GAIN OR LOSS FROM TOTAL AGRICULTURAL ASSETS 1931-64

REAL GAIN (URBAN LIVING)-PER OPERATOR-

-DOLLARS-

YEAR	P.E.I.	N.S.	N.B.	QUE.	ONT.	MAN.	SASK.	ALTA.	B.C.	MAR.	PR.	CANADA
1931	1.	49.	-7.	35.	-359.	-66.	-447.	-408.	-239.	19.	-352.	-218.
1932	441.	296.	454.	521.	320.	677.	1018.	581.	699.	387.	802.	690.
1933	433.	345.	360.	275.	951.	752.	714.	692.	406.	369.	715.	621.
1934	-124.	176.	60.	488.	93.	-2.	246.	-11.	-155.	73.	108.	193.
1935	117.	288.	271.	-11.	368.	-112.	-539.	67.	255.	249.	-247.	30.
1936	244.	39.	40.	212.	354.	295.	75.	75.	11.	77.	122.	192.
1937	-119.	-284.	-130.	-200.	-443.	-390.	-252.	-543.	-160.	-193.	-378.	-323.
1938	10.	177.	115.	183.	120.	178.	12.	254.	30.	125.	128.	136.
1939	41.	4.	-25.	148.	262.	-2.	177.	198.	82.	-2.	146.	156.
1940	185.	169.	168.	296.	73.	224.	-246.	119.	164.	145.	-24.	101.
1941	262.	165.	269.	278.	343.	204.	243.	304.	189.	226.	255.	276.
1942	-9.	61.	166.	164.	616.	214.	-121.	318.	-53.	103.	100.	234.
1943	309.	363.	425.	107.	333.	280.	308.	375.	334.	380.	546.	368.
1944	87.	-3.	-1.	-48.	-78.	196.	366.	304.	252.	14.	308.	95.
1945	50.	113.	31.	187.	306.	927.	477.	422.	315.	67.	556.	348.
1946	265.	214.	263.	144.	416.	453.	711.	1172.	493.	244.	818.	482.
1947	290.	236.	137.	221.	485.	1476.	975.	1746.	438.	206.	1358.	710.
1948	-569.	-604.	-584.	-909.	-1072.	-901.	-1568.	-1123.	-778.	-589.	-1262.	-1045.
1949	72.	87.	234.	237.	173.	778.	501.	708.	389.	143.	837.	366.
1950	817.	747.	628.	977.	2190.	1678.	2206.	1878.	1226.	715.	1969.	1634.
1951	-1066.	-1163.	-1154.	-1236.	-2297.	-2385.	-2528.	-3323.	-1978.	-1137.	-2788.	-2094.
1952	-181.	-209.	-52.	-199.	4.	648.	-280.	1234.	18.	-141.	488.	115.
1953	-40.	47.	-61.	218.	288.	-605.	-195.	-436.	330.	-16.	-391.	7.
1954	-81.	10.	33.	-62.	247.	41.	744.	61.	249.	-4.	329.	178.
1955	290.	402.	353.	377.	698.	778.	939.	692.	324.	355.	809.	609.
1956	192.	196.	250.	155.	594.	-475.	274.	318.	564.	215.	119.	285.
1957	67.	147.	83.	33.	456.	814.	305.	986.	140.	102.	683.	382.
1958	-5.	152.	9.	-77.	425.	-481.	109.	-115.	502.	57.	-113.	79.
1959	-140.	-252.	-250.	-53.	-496.	867.	1065.	906.	186.	-220.	957.	179.
1960	-8.	188.	255.	98.	723.	415.	515.	257.	-54.	155.	390.	360.
1961	233.	-6.	-127.	48.	687.	625.	2608.	1859.	402.	21.	1849.	855.
1962	-50.	-138.	-209.	12.	-23.	888.	5122.	1821.	-32.	-136.	2815.	930.
1963	161.	280.	311.	222.	1294.	2024.	6315.	2964.	419.	254.	3958.	1783.
1964	307.	315.	193.	334.	1095.	1647.	5704.	2999.	483.	271.	3650.	1663.

APPENDIX 2

This section presents some of the technical details relating to the recursive programming model discussed in Chapter VI. It contains five parts dealing with the following subjects:

A. Resource constraints

B. Economies of size and their incorporation into production activities

C. Real activities available to the farmers including production, sale of products, purchase of durable and nondurable resources, building construction, and building improvement, borrowing

D. The technique employed for the arithmetic recursive generation of the constraint vector for each year

E. Prices and price indexes used to calculate actual and expected prices for products and resources

F. Actual annual solutions of the five models examined, showing development of physical assets, utilization of production capacity, enterprise mix, expected net income (based on expected prices) and actual net income (based on realized prices).

A. RESOURCE CONSTRAINTS

1. Land

Available land was set initially at 320 acres. Only 80 percent, or 256 acres of the half section were improved; the ramainder served as natural pasture. It was assumed that any land purchased would have the same proportion of improved to total acres.

Pasture was measured in cow-calf grazing units under the assumption that approximately 3.5 acres would be required to support a cow and a calf during the grazing season. Initial pasture capacity was 18 units and each additional quarter section purchased would provide an additional nine units.

2. Machinery

Machinery purchases constitute an important portion of capital investment in the farm. It would have been extremely difficult, however, to include an individual constraint for each tractor size and each set of implements. In lieu of this, consultations were held with agricultural engineers to ascertain the type and quantity of machines and implements a farmer would need to have at his disposal to cultivate efficiently 256 acres of land under the crop rotations included in this program. Value of machinery owned at the beginning of the period was calculated accordingly. It was then necessary to calculate the additional machinery requirements to be satisfied in the event that the farmer purchased more land. These were calculated on the basis of half-section increments. Each land purchase activity included in it the added cost of acquiring the machinery necessary to cultivate efficiently the total land area at the farmer's disposal. Any equipment thus purchased could be used only on the farm. No possibility for custom work by the farmer was included in the program.

3. Buildings

Grain and machinery storage capacity was considered adequate and capable of handling relatively large expansions in the future.

"The livestock buildings consisted of (1) a fairly new loose housing shed (24' x 43') which provided 1,032 square feet of space, (2) an old horse barn converted to a hog barn. This barn (36' x 64') provided, according to the agricultural engineer, 1,920 square feet of usable space.

The loose housing barn could be used by a cow-calf enterprise or a feeder enterprise. The older barn could be used in its present condition for hogs; it could be remodeled for handling a larger number of hogs or dry sows. The barn could also be used as a loose housing barn for beef. . ." (28, pp. 55-56).

4. Labour

The operator was considered capable of supplying seasonal labour as stated on page 140. His management ability limited him to hiring an equal amount, by season, of outside workers. Additional family labour could be supplied by the wife and children. It was assumed that the wife's labour would be confined to bearing children and taking care of the house; she would contribute nothing directly to the farm business. An assumption had to be made with respect to number, sex, and age of the children in the family.

It had already been determined that the period studied would range between the operator's ages of 35 and 55; there remained the need for making an arbitrary decision as to his fertility. With little attempt to approximate any statistical averages it was decided that the farmer would be presented with three bouncing baby boys at three year intervals beginning in 1943.

The labour contributions of the sons as they matured were assumed to be as presented in table LXXVIII.

TABLE LXXVIII

SEASONAL LABOUR CONTRIBUTIONS* BY OPERATOR'S SONS ACCORDING TO AGE

Ages in Years	Spring	Summer	Autumn	Winter
	hours per day			
10 - 13	1	2	1	1
14 - 15	2	4	2	2
16 - 18	3	8	3	3
Above 18	Sons leave home			

*Measured in units of adult labour. Seasonal differences in labour input recognize time requirements of school and homework.

Total available seasonal family labour was then calculated and is summarized in table LXXIX. The amounts take into account the reduction in operator's input as explained in the text.

5. Credit

Maximum available credit was calculated on the basis of 1964 levels but was deflated to levels which would provide the same purchasing power in any given year. Thus, for example, land purchase loans in 1945 were limited to a maximum of $14,000 while in 1964 maximum credit for land was $40,000. However, the 1945 loan would have allowed the farmer to buy the same area as that of 1964. The same is true of loans for livestock, machinery, and buildings. Table LXXX shows the nominal growth in credit available to the farmer by loan categories.

TABLE LXXIX

HOURS OF UNPAID FAMILY LABOUR AVAILABLE TO FARM ENTERPRISES (BY SEASONS)*

Years	Spring			Summer			Autumn			Winter		
	Operator	Sons	Total	Operator	Sons	Total	Operator	Sons	Total	Operator	Sons	Total
1-8	490	--	490	540	---	540	675	--	675	975	---	975
9-10	490	50	540	540	100	640	675	50	725	975	150	1125
11	465	50	515	513	100	613	641	50	691	926	150	1076
12	465	100	565	513	200	713	641	100	741	926	300	1226
13-14	465	150	615	513	300	813	641	150	791	926	450	1376
15	465	250	715	513	600	1113	641	250	891	926	750	1676
16-17	442	300	742	487	900	1387	609	300	909	880	900	1780
18	442	200	642	487	500	987	609	200	809	880	600	1480
19-20	442	250	692	487	600	1087	609	250	859	880	750	1630

*Calculated in adult equivalents.

TABLE LXXX

MAXIMUM CREDIT AVAILABLE FOR FARM INVESTMENT ACTIVITIES

Year	Land Purchase	Farm Improvement	Cattle		Total Credit
			Feeder	Breeder	
	Dollars				
1945	14000.	7500.	5000.	3100.	29600.
1946	17000.	7700.	4700.	3300.	32700.
1947	18000.	8300.	5300.	3700.	35300.
1948	23000.	9600.	8600.	5000.	46200.
1949	24000.	9900.	8400.	5500.	47800.
1950	26000.	10000.	10000.	6000.	52000.
1951	28000.	11300.	10000.	6000.	55300.
1952	29000.	11900.	9400.	6000.	56300.
1953	33000.	11900.	7200.	6000.	58100.
1954	33000.	11900.	7300.	6000.	58200.
1955	33000.	11900.	7700.	6000.	58600.
1956	33000.	12000.	7800.	6000.	58800.
1957	33000.	12500.	8200.	6000.	59700.
1958	33000.	12600.	10000.	6000.	61600.
1959	33000.	13100.	10000.	6000.	62100.
1960	35000.	13500.	10000.	6000.	64500.
1961	37000.	13700.	10000.	6000.	66700.
1962	37000.	14100.	10000.	6000.	67100.
1963	40000.	14600.	10000.	6000.	70600.
1964	40000.	15000.	10000.	6000.	71000.

It was assumed that economies of size could be achieved in the cost of crop production through acquisition of additional land. Such savings would probably stem from reduced hours of labour and machine operation per unit of land, hence lower operation, maintenance, and depreciation costs per unit of output. As the basis for calculating lower costs per unit of crop rotation, the findings of H. V. Walker (56) were used. Walker derived a cost curve envelope showing the following relation between cost per unit of output and size of operation (measured in acres):

$$Y = 35.08 - 0.025X_1 + 0.0000127X_1^2$$

where

Y = unit cost per $40 of production

X_1 = improved land, measured in acres

Applying that function to Jeanneau's cost figures for the rotations employed the following relative index of cost of production was obtained for farms ranging in size from two quarter sections to 12 quarter sections.

TABLE IXXXI

ECONOMIES OF SIZE IN CROP PRODUCTION---
QUARTER SECTION UNITS

Units of Land (quarter sections)	Index of Costs %	Units of Land (quarter sections)	Index of Costs
2	108		
3	100		
4	95	7	84
5	89	8	83
6	85	9	85
		10	87
		11	92
		12	97

It is of interest to note that maximum economies appear to be obtainable with 8 quarters of land (two sections).

For lack of more precise information the indexes derived by use of Walker's formula were applied to the crop rotation input-output coefficients for operating capital, long term capital and seasonal labour.

Some economies of large size can also be assumed to exist for various livestock enterprises. These would be found mainly in reduction of labour inputs and in housing costs per animal. Separate activities expressing such savings were introduced through linking them to larger building capacities. A technical difficulty was encountered in introducing this feature into the program. In the case of crops it was simple to allow two activities to compete where the only difference between them was in scale of operation. Coincidental with a land purchase or rental activity a land consolidation activity was introduced. The more profitable large scale activity could enter the solution only after land purchase and consolidation had reached a given level. The small scale crop activity could only be introduced if no extra land was obtained. The two activities were mutually exclusive. Where livestock enterprises were concerned a problem of building utilization existed. The difference in profitability between large scale (dependent on construction of larger buildings) and small scale (utilizing existing buildings or new structures of similar dimensions) operations could force into the optimal solution building activities for large scale enterprises while the already existing buildings were left vacant. To avoid this difficulty three types of building constraints were introduced--those constraints which expressed the capacity of already existing structures, one for capacity created by a building activity which would improve and modernize existing accommodations, and

another with a coefficient relating it to an activity providing structures which allowed for economies of size. Livestock activities enjoying such economies also included payments of interest on investment and depreciation incurred by the necessary new construction; thus, they are forced to compete with the activities which utilized existing structures but which did not have to pay such expenses. In other words, the principle that previously incurred costs do not play a functional role in production decisions was utilized to avoid the dilemma.

Production activities or farm enterprises were selected from Jeanneau's study (28). Of the many alternatives developed by Jeanneau only representative ones were chosen for this study since the object of the present work was not to develop an optimum combination of livestock enterprises but rather to observe and compare the growth of a number of firms facing identical production possibilities but reacting to outside influences with different decision patterns. Thus, for example, although Jeanneau allowed a choice among a number of rations in the cattle activities, here only one ration was made available to the operator for any given enterprise.

The matrix can be divided into a number of subsets of vectors representing major groups of activities:

1. Self-financed cattle operations (4 activities),
2. Loan-financed cattle operations (3 activities),
3. Hog production activities:
   a. in existing buildings (2 activities);
   b. in existing buildings which had been improved to allow for more efficient utilization of labour and space (2 activities);
   c. in new buildings which must be constructed if such activities are to enter the optimal solution (2 activities).
4. Crop rotations. Two basic rotations were used: one producing a minimum of forage and one producing a medium quantity of forage. Each of these could be fertilized or unfertilized depending on the relative

profitability of devoting capital and labour to the purchase and spreading of soil nutrients. A detailed description of the rotations can be found in Jeanneau's study.

The fertilized and unfertilized variations on the minimum and medium forage rotations served as a group of four among which the entrepreneur could choose. Net costs and input-output coefficients between the rotations and seasonal labour and flow capital were altered subject to Walker's average cost curve expressing economies and diseconomies of size and on the basis of quarter section additions of land. Since provisions were made for a maximum addition of two sections (or eight quarters) of land, there were 9 groups of the four basic crop rotations or a total of 36 rotation activities.

5. Grain buying and selling activities. The crop rotation activities were given negative net revenue coefficients which expressed the variable costs involved in crop production. When a rotation entered the final basis, the crops produced (wheat, oats, and hay) were transferred to storage rows in the matrix from whence they could be either consumed by livestock or sold. No market for hay was assumed.

Wheat could only be sold as it was not included in the livestock rations. Oats could be consumed, sold, or if livestock consumption of this grain exceeded production, purchased. Barley was not produced by the rotations but could be purchased for livestock consumption.

6. Labour hiring activities. Seasonal labour could be hired to the limit of the number of hours that the operator himself was willing to work. The price per hour of spring, summer, and autumn hired labour was identical and slightly higher than that of winter labour.

7. Land purchase and rental activities. These activities were divided into three main groups.

a. Purchase of land taking full advantage of credit sources available. This included financing of two-thirds of the purchase price of new machinery needed for cultivating the additional land (8 activities, each allowing the purchase of one quarter section).

b. Complete self-financing of land and machinery purchases (8 activities, as above).

c. Land rental activities. These activities were included when it became clear that a labour shortage might make it more profitable to intensify livestock production than to cultivate all the land that had been acquired previously in the process of expanding. Rather than leave the land fallow and invest money and labour in the fallowing operations, the farmer was given the opportunity to rent out his land. The return on such an operation was relatively low due to the assumption that rental agreements would be on a cash basis and only for one year at a time. It is therefore plausible to assume that under such conditions the land would not receive the treatment and care that it would have enjoyed had it remained within the regular rotation with the rest of the operator's land. The difference between current land rental rates and the net return assigned to the activity represented the cost involved in maintaining the soil productivity assumed in the crop rotation activities. (There were nine land transfer activities and one rental activity, corresponding to the nine land constraint rows and one rental row in the matrix. This allowed the farmer to rent out land after the farm had reached any size from one-half section to two and one-half sections.)

8. Construction and building improvement activities. The matrix allowed for the construction of a new farrowing barn, a feeder hog barn and the improvement of existing hog buildings suitable for farrow and finish operations and for farrowing operations. Any of these could be financed either from cash reserves or through appropriate credit agencies. In addition to the above six activities the program allowed for construction of additional housing space for beef cattle. In total, seven construction activities were available to the entrepreneur.

9. Purchase of savings bonds. This activity served as a regulator. In years when other factors such as labour or land were so limiting that not all the cash available could be invested productively in the farm, the bond buying activity provided a form of investment which returned four and one-half percent. This still left a high level of liquidity. If, in the coming year, the funds could be used more profitably in farm enterprises the bonds could be converted back to cash. In most respects it served the same purpose for the cash reserves as the land rental activity did for land reserves.

D. FLEXIBILITY CONSTRAINTS AND RECURSIVE GENERATION OF THE CONSTRAINT VECTOR (b_{it})

In equation (5) of Chapter V the right-hand side or constraint vector was shown to be dependent on the optimal solution of the previous year and on a set of coefficients γ_i, each of which dictated the rate at which any particular constraint i could change from year to year. In the present model the recursive principle was adopted with some modification in the mathematical technique for the generation of the new constraint levels.

The modification appeared necessary due to the differences between the aggregate approach on which Day's model was based and the micro model employed here. In this study physical resources (the quantity of which may be inadequate due to subjective constraints) limit production in most cases and constraints change as assets are acquired. In those instances where profit maximization was inhibited due to subjective restrictions (flexibility constraints) on resource use such limitations were introduced through the vector $u_i(t)$ of "exogenous" data. (In the present context "exogenous" refers to the technical matrix, rather than to the entrepreneur's decision process.)

Perhaps the clearest method of explaining the recursive generation of the constraint vector is through the use of the submatrices found in the schematic presentation of the structural matrix on page 144. It has been reproduced here again for ease of reference.

If the vector b(t) is divided into subvectors as shown in the structural matrix, then using matrix notation and corresponding subscripts we have:

SCHEMATIC REPRESENTATION OF STRUCTURAL MATRIX EMPLOYED IN SIMULATION OF FAMILY FARM GROWTH

Sub Vectors b_i	Activities / Constraints	Cattle Self Financed	Cattle Credit Financed	Row Production: Exist. & Impr. Bldgs.	Row Production: New Bldgs.	Crop Rotation	Grain 1/ Buying & Selling	Labour Hiring	Land 2/ Purchase & Rental	Bldg. Const. Self Financed	Building Construction Cr.	Outside 3/ Investment
		1, 1	, 5	, 8	, 12	, 14	, 50	, 54	, 58	, 85	, 89	, 92
b_1	Seasonal Family Labor	A_{11}	A_{12}	A_{13}	A_{14}	A_{15}	0	A_{17}	0	0	0	0
		5,										
b_2	Seasonal Hired Labor	0	0	0	0	0	0	A_{27}	0	0	0	0
		9,										
b_3	Land Consolidation & Rental	0	0	0	0	A_{35}	0	0	A_{38}	0	0	0
		20,										
b_4	Pasture & Pstr. Rental	A_{41}	A_{42}	0	0	A_{45}	0	0	A_{48}	0	0	0
		22,										
b_5	Grain & Hay	A_{51}	A_{52}	A_{53}	A_{54}	A_{55}	A_{56}	0	0	0	0	0
		25,										
b_6	Livstk. Space (Existing)	A_{61}	A_{62}	A_{63}	0	0	0	0	0	A_{69}	A_{610}	0
		27,										
b_7	Livstk. Space New&Improved	A_{71}	A_{72}	A_{73}	A_{74}	0	0	0	0	A_{79}	A_{710}	0
		30,										
$b_8(t)$	Credit Constraints	0	$A_{82}(t)$	0	0	0	0	0	$A_{88}(t)$	0	$A_{810}(t)$	0
		37,										
$b_9(\tau)$	Cash Constraints	$A_{91}(t)$	$A_{92}(t)$	$A_{93}(t)$	$A_{94}(t)$	$A_{95}(t)$	0	0	$A_{98}(t)$	$A_{99}(t)$	0	$A_{911}(t)$
		40,										
b_{10}	Outside Inv.	0	0	0	0	0	0	0	0	0	0	A_{1011}
$Z(t)$	Net Rev.(+) or cost (-)	$+(t)$	$+(t)$	$+(t)$	$+(t)$	$-(\tau)$	$-,+(t)$ (1)	$-(t)$	$-,+(t)$ (2)	$-(t)$	$-(t)$	+ (3)

(1) Grain buying costs include transportation to farm. Grain selling revenues are net of transportation & handling costs.

(2) Land purchase costs include 1 year's interest on purchase cost of land and machinery plus 1 year's depreciation on machinery. Positive revenue designates a hiring out activity.

(3) Return on outside investment is 4.5 percent throughout the entire period.

(4) Figures in northwest corner of squares of b_1 vector indicate total number of activities to that point. Total number of activities in the matrix is 92.

$$b_1^T(t) = U_1^T(t) = F(t)\ (490\ 540\ 675\ 975) + \left[S^T(t)H\right]^T$$

Where:

F = 1.00 for t = 1945 . . .1954

0.95 for t = 1955 . . .1959

0.90 for t = 1960 . . .1964

S = vector designating the number of sons in each age category

H = matrix of total hours of seasonal labour a son contributes in each age category, shown in table LXVIII

$$b_2^T(t) = b_2^T = (490\ 540\ 675\ 975)$$

$$b_3^T(t) = b_3\ (t-1) - A_{3,8}\ X_8^*\ (t-1)$$

The nonzero coefficients of $A_{3,8}$ are negative.

$b_4^T(t) = b_4^T(t-1) + 9$ [number of quarter sections of land purchased in period (t-1)]

$$b_5^T(t) = 0 \text{ for all } t$$

This assumes no storage of crop products from year to year. Each year is begun with zero inventory. The coefficients in $A_{5,5}$ are all negative.

$$\begin{bmatrix} b_6(t) \\ b_7(t) \end{bmatrix} = \begin{bmatrix} b_6(t-1) \\ b_7(t-1) \end{bmatrix} - \begin{bmatrix} A_{6,9} & A_{6,10} \\ A_{7,9} & A_{7,10} \end{bmatrix} \begin{bmatrix} X_9^*(t-1) \\ X_{10}^*(t-1) \end{bmatrix}$$

Nonzero coefficients of $A_{6,9}$ and $A_{6,10}$ are positive, indicating that when a building improvement activity (improvement having been lumped schematically with construction in columns 85 through 91) occurs, an

appropriate number of units of existing livestock space is removed from the b_6 constraint. The nonzero coefficients of $A_{7,9}$ and $A_{7,10}$ are negative, indicating that construction and improvement activities enlarge or contribute to the constraint governing new and improved livestock housing space. Due to the reversal of signs in the input-output submatrix, the second expression must be subtracted from the constraint existing in year (t-1), rather than added to it.

$$b_8(t) = b_8(t-1) - \left[A_{8,2}\ A_{8,8}\ A_{8,10}\right](t-1)\left[X_2^*\ X_8^*\ X_{10}^*\right]^T(t-1) + R(t-1) + U_8(t) - U_8'(t)$$

where:

$R(t-1)$ = principal repaid on outstanding debts in year (t-1)

$U_8'(t)$ = an exogenous vector representing extensions of the limit on each credit source over and above the limits prescribed in year t-1.

For nonusers of credit $b_8(t)$ would equal zero for all t. For the cautious credit user the vector $U_8'(t)$ could be nonzero but would be zero for all others. Where credit is limited to a given proportion of total capital or net worth it would consist of zero elements in all rows except the total credit constraint row. The value in this row is equal to:

a) zero if total credit available maintains a liabilities/net worth ratio smaller than the maximum acceptable to the farmer or

b) the difference between the sum of the amounts of credit available in year t and that proportion of net worth which was fixed as an upper limit on total farm liabilities.

For example, if total net worth were $75,000 and the ratio of

debt to net worth acceptable to the farmer were 1/3, the maximum debt burden the farmer would accept would be $25,000. If the value of the sum of all other elements in $b_0(t)$ were $29,000, then $U'_0(t)$ would have the form $[0 \ldots 0 \ 4{,}000]$. If the opposite were true and total credit available were less than the operator's self-imposed limit, $U'_0(t)$ would equal the zero vector.

This formulation leaves the entrepreneur a certain amount of flexibility insofar as he can borrow as much money as is available from any given source as long as he remains within his self-imposed limits on total debt.

E. PRICE INDEXES USED TO CALCULATE ACTUAL AND EXPECTED PRICES FOR PRODUCTS AND RESOURCES

Net revenues or costs for real activities were generally used as found in Jeanneau's study (28). These represented actual figures for 1964 in western Manitoba. It was necessary to apply deflators in a number of stages to obtain product prices, revenues per unit of activity and variable costs per unit of activity in order to calculate annual net revenues or costs for each of the activities from 1945 to 1964. It was not difficult to do for the products produced; however, obtaining realistic deflated values of production costs was not as simple. This required breaking down production costs into categories such as seed, fertilizer, fuel, and lubricants, etc., deflate each component with an appropriate index and then reconstitute the new production cost.

The indexes employed were constructed from a number of sources. All were brought to a base of 1964 = 100 and calculated for the preceding 20-year period. The main derived indexes which were constructed appear in table LXXXII.

TABLE LXXXII

INDEXES FOR CALCULATING ACTUAL AND EXPECTED PRICES FOR PRODUCTS AND INPUTS 1945-1964
1964 price or index value = 100

Year	(1) Wheat	(2) Oats	(3) Barley	(4) Steers	(5) Good Feeder Steers	(6) Grade B Hogs	(7) Common-Medium Calves	(8) Occupied Farm Land	(9) Composite Farm Index	(10) Farm Machinery	(11) Building Materials	(12) Fertilizer	(13) Hired Labour
1944	70	86	78	51	41	70	39	34	48	43	47	59	--
1945	90	84	70	52	42	71	40	36	49	42	47	59	48
1946	90	90	80	55	49	76	45	42	51	43	47	59	50
1947	91	129	115	62	53	88	47	46	55	46	51	60	55
1948	93	111	100	84	86	119	65	58	64	52	63	66	60
1949	90	125	136	92	84	121	76	61	66	58	68	72	60
1950	87	124	118	112	118	118	96	66	68	60	76	75	59
1951	87	121	115	145	146	131	125	71	75	68	88	88	66
1952	89	106	110	110	94	104	85	73	79	71	90	93	71
1953	75	100	90	84	72	116	68	83	78	72	92	95	72
1954	70	106	93	80	73	118	64	76	77	72	91	101	70
1955	77	106	91	84	77	94	71	78	77	73	91	97	70
1956	66	90	76	81	78	99	69	81	80	76	93	97	75
1957	72	97	79	82	82	120	74	80	83	81	94	96	80
1958	74	102	80	100	104	107	97	83	84	86	94	99	82
1959	74	110	77	109	110	90	111	81	87	90	95	100	87
1960	88	108	83	99	101	92	104	88	90	92	97	98	88
1961	97	119	109	98	103	106	105	92	91	94	96	96	90
1962	93	106	98	114	117	109	116	93	94	97	96	97	92
1963	98	98	98	105	111	105	110	100	97	99	98	99	96
1964	100	100	100	100	100	100	100	100	100	100	100	100	100

Sources: Columns 1 - 3 Quarterly Bulletin of Agricultural Statistics, prices for Canada.
4 - 7 Derived from prices of livestock at Winnipeg , 1944-1964, Canada Yearbooks.
9 - 12 Dominion Bureau of Statistics--Prices and Price Indexes No. 62-002
8, 13 Composite sources.

F. SOLUTIONS OF THE RECURSIVE PROGRAMMING PROBLEMS FOR THE FIVE MODELS ANALYSED

The following tables (LXXXIII through LXXXVII) show the development of productive capacity and production trends in each of the five models over the twenty-year period. They also indicate the difference between the expected and realized values of the objective functions in each year. The difference between the two values represents unfulfilled expectations with respect to product prices as well as production costs.

TABLE LXXXIII

PRODUCTION FACILITIES AND ENTERPRISE MIX

MODEL I - PROFIT MAXIMIZER WITH LIMITED LABOR SUPPLY

	Initial Endowment	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955
Investment and Construction												
Land	256	485	723	750	796	796	796	796	796	796	796	796
Cattle Buildings -	2,952	2,952	2,952	3,175	3,175	2,852	2,500	2,442	2,559	3,088	3,088	3,088
Improved	0	0	0	0	0	0	0	0	0	0	0	0
Feeder Hog Barns	0	0	0	0	0	40	76	93	93	93	93	403
Farrowing Barn	1,920	1,920	1,920	1,920	1,920	1,277	925	867	867	867	867	867
New	0	0	105	203	241	241	241	241	241	241	241	241
Improved	0	0	0	0	0	643	995	1,053	1,053	1,053	1,053	1,053
Rent Pasture	0	0	0	0	0	0	0	0	0	0	0	0
Production Activities												
Cow-Calf		0	0	0	0	0	0	0	0	0	0	0
Feeder Cattle		120	100	84	70	79	79	78	128	154	42	10
Yearlings		0	0	0	0	0	0	0	30	75	38	56
Stocker Cattle		0	0	14	0	0	0	0	13	36	0	0
Farrow and Finish		2	1	0	0	6	10	10	10	10	10	10
Farrow		0	35	68	81	58	42	39	0	0	39	39
Feeder Hogs		0	0	0	0	40	76	93	93	42	295	403
Cropland Cultivated		485	723	750	796	776	796	776	698	416	124	58
Cropland Rented		0	0	0	0	20	0	20	98	381	672	738
Sell Wheat		1,726	2,602	2,702	2,866	2,795	2,866	2,794	2,514	1,496	445	210
Sell Oats		984	1,606	1,433	1,515	925	653	421	354	0	0	0
Buy Oats		0	0	0	0	0	0	0	0	317	3,605	4,688
Buy Barley		2,224	2,481	3,135	2,782	3,027	3,084	3,154	4,045	5,363	4,586	5,069
Hire Labor - Spring		88	302	490	490	490	490	490	490	490	368	466
Summer		6	282	495	521	506	510	506	434	303	241	367
Fall		280	490	639	655	675	675	675	675	595	354	350
Winter		405	628	683	904	975	949	975	975	975	975	975
Expected Net Income		7,456	11,648	13,722	15,894	21,139	24,108	26,556	37,042	31,114	27,274	29,229
Realized Net Income		9,240	11,739	16,152	23,599	24,133	26,396	34,277	27,258	23,625	26,556	18,905

PRODUCTION FACILITIES AND ENTERPRISE MIX

MODEL I - PROFIT MAXIMIZER WITH LIMITED LABOR SUPPLY

	1956	1957	1958	1959	1960	1961	1962	1963	1964
Investment and Construction									
Land	796	796	796	796	796	796	796	796	796
Cattle Buildings -	3,088	3,088	3,088	3,088	3,681	3,681	3,681	3,681	3,681
Improved	0	0	0	0	0	0	0	0	0
Feeder Hog Barns	403	403	403	407	407	407	407	407	407
Farrowing Barn	0	0	0	0	0	0	0	0	0
New	241	241	241	241	241	241	241	241	241
Improved	1,920	1,920	1,920	1,920	1,920	1,920	1,920	1,920	1,920
Rent Pasture	0	0	0	0	0	0	0	0	0
Production Activities									
Cow-Calf	0	0	0	4	0	31	25	3	3
Feeder Cattle	110	92	76	87	184	127	83	174	179
Yearlings	0	9	14	0	50	8	0	0	0
Stocker Cattle	82	0	0	0	0	0	0	0	0
Farrow and Finish	19	19	19	19	19	19	19	19	19
Farrow	0	0	0	0	0	0	0	0	0
Feeder Hogs	165	298	362	407	0	143	136	34	25
Cropland Cultivated	627	225	789	220	471	796	796	426	615
Cropland Rented	169	571	7	576	325	0	0	370	181
Off-Farm Investment	0	0	0	0	0	0	0	0	0
Sell Wheat	2,259	811	685	791	1,697	2,867	2,867	1,533	2,214
Sell Oats	0	0	0	0	0	0	0	0	0
Buy Oats	984	3,557	4,196	4,577	375	305	0	810	72
Buy Barley	3,786	4,393	4,601	4,699	5,414	4,181	3,150	4,175	4,209
Hire Labor - Spring	412	231	262	201	308	462	358	154	257
Summer	299	0	10	0	0	0	25	0	0
Fall	675	422	409	424	596	675	527	548	675
Winter	975	975	975	975	767	975	695	940	975
Expected Net Income	22,015	23,233	30,723	29,064	24,899	22,379	20,532	26,005	22,743
Realized Net Income	21,461	28,748	26,612	21,361	20,796	23,306	23,776	22,416	21,185

TABLE LXXXIV

PRODUCTION FACILITIES AND ENTERPRISE MIX

MODEL II - PROFIT MAXIMIZER WITH UNLIMITED LABOUR SUPPLY

	Initial Endowment	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955
Investments and Construction												
Land	256	485	723	751	804	804	804	804	804	804	804	804
Cattle Buildings	2,952	2,952	2,952	2,952	2,952	4,044	4,044	4,044	5,928	5,928	5,928	5,928
Improved	0	0	0	0	0	0	0	0	0	0	0	0
Feeder Hog Barns	0	0	0	0	0	5	42	80	80	80	175	213
Farrowing Barn	1,920	1,920	1,920	1,920	1,920	1,920	1,920	1,920	1,920	1,920	1,920	1,920
New	0	0	105	231	262	262	262	262	262	262	262	262
Improved	0	0	0	0	0	0	0	0	0	0	0	0
Rent Pasture												
Production Activities												
Cow-Calf		0	0	0	0	0	4	18	0	0	0	0
Feeder Cattle		120	100	63	52	106	100	77	200	195	200	198
Yearlings		0	0	26	0	0	0	0	0	60	0	0
Stocker Cattle		0	0	0	0	0	0	0	0	0	0	0
Farrow and Finish		2	1	0	0	0	0	0	0	0	0	0
Farrow		0	35	77	87	87	87	87	87	87	87	87
Feeder Hogs		0	0	0	0	5	41	80	0	0	175	212
Cropland Cultivated		485	723	751	804	804	804	804	590	804	481	476
Cropland Rented		0	0	0	0	0	0	0	214	0	323	328
Off-Farm Investment		0	0	0	0	0	0	0	0	0	0	0
Sell Wheat		1,726	2,601	2,702	2,893	2,893	2,893	2,893	2,125	2,893	1,731	1,714
Sell Oats		984	1,606	1,434	1,560	1,229	909	642	17	802	0	0
Buy Oats		0	0	0	0	0	0	0	0	0	2,017	2,371
Buy Barley		2,224	2,480	3,238	2,579	3,580	3,683	3,506	5,235	6,680	6,214	6,386
Hire Labor - Spring		88	302	537	485	613	646	669	707	1,002	775	830
Summer		6	282	569	541	600	634	658	532	827	526	585
Fall		280	490	606	606	887	909	863	1,224	1,360	1,328	1,395
Winter		405	628	775	793	1,406	1,497	1,561	2,429	2,230	2,762	2,891
Expected Net Income		7,456	11,648	13,742	15,773	25,223	25,871	28,714	45,297	37,075	33,546	34,495
Realized Net Income		9,240	11,739	16,110	23,139	25,170	29,029	36,714	31,575	29,291	32,392	28,787

PRODUCTION FACILITIES AND ENTERPRISE MIX
MODEL II - PROFIT MAXIMIZER WITH UNLIMITED LABOUR SUPPLY

		1956	1957	1958	1959	1960	1961	1962	1963	1964
Investments and Construction										
Land		804	804	804	804	804	804	804	804	804
Cattle Buildings -		5,975	5,975	5,975	5,975	5,975	5,975	5,975	5,975	5,975
	Improved	0	0	0	0	0	0	0	0	0
Feeder Hog Barns		213	213	386	496	496	496	496	496	496
Farrowing Barn		1,920	1,920	1,920	1,920	1,920	1,920	1,920	1,920	1,920
	New	262	262	262	262	262	262	262	262	262
	Improved	0	0	0	0	0	0	0	0	0
Rent Pasture										
Production Activities										
Cow-Calf		0	0	23	5	0	0	51	3	5
Feeder Cattle		202	200	99	87	186	186	83	175	182
Yearlings		0	0	0	0	82	0	0	0	0
Stocker Cattle		0	0	0	0	0	0	0	0	0
Farrow and Finish		0	0	0	0	0	0	0	0	0
Farrow		87	87	87	87	87	87	87	87	87
Feeder Hogs		203	213	386	496	0	132	167	136	142
Cropland Cultivated		804	482	308	223	497	804	804	431	451
Cropland Rented		0	322	496	581	307	0	0	373	353
Off-Farm Investment		0	0	0	0	0	0	0	0	0
Sell Wheat		2,893	1,733	1,108	801	1,788	2,893	2,893	1,550	1,622
Sell Oats		0	0	0	0	0	0	0	0	0
Buy Oats		1,139	2,369	4,117	5,351	245	381	257	1,703	1,724
Buy Barley		6,414	6,429	5,616	5,980	7,047	5,709	4,142	5,547	5,712
Hire Labor -	Spring	954	739	649	541	702	667	698	509	544
	Summer	723	392	348	72	0	0	322	0	8
	Fall	1,552	1,311	951	847	974	1,210	917	993	1,050
	Winter	2,764	2,617	2,312	1,912	1,472	1,826	1,832	1,921	2,029
Expected Net Income		27,561	28,879	36,262	33,901	29,507	25,017	24,161	30,598	26,926
Realized Net Income		27,955	33,982	32,047	23,977	24,875	25,589	26,097	33,243	24,313

TABLE LXXV

PRODUCTION FACILITIES AND ENTERPRISE MIX

MODEL III- NO CREDIT AVERAGE CONSUMPTION

	Initial Endowment	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955
Investments and Construction												
Land	256	256	256	256	256	256	256	256	256	256	256	256
Cattle Buildings -	2,952	2,217	1,544	1,204	1,204	1,204	1,204	1,204	1,203	1,203	1,203	1,203
Improved	0	0	0	0	0	0	0	0	0	0	0	0
Feeder Hog Barns	0	0	0	0	9	52	91	121	215	215	310	423
Farrowing Barn	1,920	1,185	512	172	172	172	172	172	169	169	169	169
New	0	0	0	23	23	23	23	23	23	23	23	23
Improved	0	735	1,408	1,748	1,748	1,748	1,748	1,748	1,751	1,751	1,751	1,751
Rent Pasture												
Production Activities												
Cow-Calf		0	0	0	0	0	0	0	0	0	0	0
Feeder Cattle		30	30	30	30	30	30	30	30	30	30	25
Yearlings		0	0	0	0	0	0	0	0	156	0	0
Stocker Cattle		0	0	0	0	0	0	0	0	0	0	0
Farrow and Finish		10	16	17	17	17	17	17	17	17	17	17
Farrow		0	0	8	8	8	8	8	8	8	8	8
Feeder Hogs		0	0	0	9	52	91	113	223	16	309	433
Cropland Cultivated		256	256	256	256	256	256	256	80	165	72	61
Cropland Rented		0	0	0	0	0	0	0	176	91	184	195
Off-Farm Investment		0	0	0	0	0	0	0	0	0	0	0
Sell Wheat		921	921	921	921	921	921	921	272	595	259	216
Sell Oats		125	0	0	0	0	0	0	0	0	0	0
Buy Oats		0	135	331	418	817	1,182	1,388	3,059	812	3,889	5,057
Buy Barley		1,042	1,252	1,483	1,535	1,772	1,990	2,113	2,725	5,501	3,211	3,813
Hire Labor - Spring		0	0	0	0	13	52	74	64	490	97	227
Summer		0	0	0	0	0	34	56	0	397	0	114
Fall		0	0	0	0	0	49	76	79	44	132	287
Winter		0	0	0	0	81	189	249	550	0	639	975
Expected Net Income		4,710	6,100	7,017	7,581	14,185	14,535	16,020	23,813	19,016	22,076	26,537
Realized Net Income		5,367	6,236	7,387	12,373	13,141	15,283	19,678	15,250	16,202	22,406	15,711

PRODUCTION FACILITIES AND ENTERPRISE MIX
MODEL III - NO CREDIT AVERAGE CONSUMPTION

	1956	1957	1958	1959	1960	1961	1962	1963	1964
Investments and Construction									
Land	256	256	256	256	256	256	256	256	256
Cattle Buildings -	1,203	1,203	1,203	1,203	1,203	1,203	1,034	1,034	1,034
Improved	0	0	0	0	0	0	0	0	0
Feeder Hog Barns	451	451	599	704	704	704	704	704	757
Farrowing Barn	169	169	169	169	169	169	0	0	0
New	23	23	23	23	23	23	23	23	23
Improved	1,751	1,751	1,751	1,751	1,751	1,751	1,920	1,920	1,920
Rent Pasture									
Production Activities									
Cow-Calf	0	0	0	0	0	0	0	0	0
Feeder Cattle	30	30	0	12	30	30	0	13	0
Yearlings	0	0	0	0	128	0	0	22	15
Stocker Cattle	0	0	0	0	0	0	2	0	28
Farrow and Finish	17	17	17	17	17	17	19	19	19
Farrow	8	8	8	8	8	8	0	0	0
Feeder Hogs	451	436	598	704	343	634	704	704	757
Cropland Cultivated	72	72	0	29	146	72	98	45	9
Cropland Rented	184	184	256	227	108	184	158	211	247
Off-Farm Investment	0	0	0	0	0	0	0	0	0
Sell Wheat	259	259	0	104	534	259	354	162	32
Sell Oats	0	0	0	0	0	0	0	0	0
Buy Oats	5,209	5,070	6,687	7,636	3,925	6,925	7,323	7,590	8,148
Buy Barley	3,998	3,915	4,284	5,090	6,610	5,021	4,799	5,588	5,479
Hire Labor - Spring	214	149	194	247	490	220	316	349	335
Summer	48	0	0	0	0	0	0	0	0
Fall	292	224	221	336	217	353	383	388	366
Winter	926	736	851	975	75	877	975	975	975
Expected Net Income	16,571	20,516	33,390	29,127	18,594	17,001	20,848	26,515	24,276
Realized Net Income	19,025	27,086	25,119	16,419	16,377	21,375	24,720	23,722	19,665

TABLE LXXXVI

PRODUCTION FACILITIES AND ENTERPRISE MIX

MODEL IV - NO CREDIT - FORCED SAVING

	Initial Endowment	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955
Investments and Construction												
Land	256	256	256	256	256	256	256	256	256	256	256	256
Cattle Buildings -	2,952	2,217	1,283	1,283	1,283	1,283	1,283	1,283	1,281	1,281	1,281	1,032
Improved	0	0	0	0	0	0	0	0	0	0	0	0
Feeder Hog Barns	0	0	0	12	24	78	121	143	269	269	376	556
Farrowing Barn	1,920	1,185	251	251	251	251	251	251	249	249	249	0
New	0	0	0	34	34	34	34	34	34	34	34	34
Improved	0	735	1,669	1,669	1,669	1,669	1,669	1,669	1,671	1,671	1,671	1,920
Rent Pasture												
Production Activities												
Cow-Calf		0	0	0	0	0	0	0	0	0	0	0
Feeder Cattle		30	30	30	30	30	30	30	30	30	30	0
Yearlings		0	0	0	0	0	0	0	0	0	0	9
Stocker Cattle		0	0	0	0	0	0	0	0	132	0	0
Farrow and Finish		11	17	17	17	17	17	17	17	17	17	19
Farrow		0	0	11	11	11	11	11	11	11	11	0
Feeder Hogs		0	0	13	24	78	121	143	269	132	376	556
Cropland Cultivated		256	256	256	256	256	256	256	72	151	72	0
Cropland Rented		0	0	0	0	0	0	0	184	105	184	256
Off-Farm Investment		0	0	0	0	0	0	0	0	0	0	0
Sell Wheat		921	921	921	921	921	921	921	259	542	259	0
Sell Oats		125	0	0	0	0	0	0	0	0	0	0
Buy Oats		0	237	445	556	1,059	1,462	1,665	3,507	1,751	4,510	6,294
Buy Barley		1,042	1,334	1,585	1,650	1,950	2,191	2,311	3,017	5,460	3,616	3,979
Hire Labor - Spring		0	0	0	0	50	93	114	117	490	174	235
Summer		0	0	0	0	31	74	96	49	393	56	142
Fall		0	0	0	0	45	99	126	144	133	228	246
Winter		0	0	1	33	181	99	359	706	123	851	975
Expected Net Income		4,710	6,376	7,361	7,932	15,373	15,717	17,150	25,919	20,151	24,622	29,391
Realized Net Income		5,367	6,528	7,710	13,188	14,181	16,442	21,098	16,406	19,034	24,988	16,541

PRODUCTION FACILITIES AND ENTERPRISE MIX

MODEL IV - NO CREDIT - FORCED SAVING

	1956	1957	1958	1959	1960	1961	1962	1963	1964
Investments and Construction									
Land	256	256	256	256	256	256	256	256	256
Cattle Buildings - Improved	1,032	1,032	1,032	1,032	1,032	1,032	1,032	1,032	1,032
Feeder Hog Barns	556	556	669	774	774	774	774	774	796
Farrowing Barn	0	0	0	0	0	0	0	0	0
New	34	34	34	34	34	34	34	34	34
Improved	1,920	1,920	1,920	1,920	1,920	1,920	1,920	1,920	1,920
Rent Pasture									
Production Activities									
Cow-Calf	0	0	0	0	0	0	0	0	0
Feeder Cattle	30	30	0	0	30	30	0	0	0
Yearlings	31	0	0	19	88	10	0	50	50
Stocker Cattle	0	0	0	0	0	0	28	0	27
Farrow and Finish	19	19	19	19	19	19	14	19	15
Farrow									
Feeder Hogs	490	515	669	774	535	691	751	757	796
Cropland Cultivated	90	72	0	12	125	78	71	30	30
Cropland Rented	166	184	256	244	131	178	185	226	226
Off-Farm Investment	0	0	0	0	0	0	0	0	0
Sell Wheat	325	259	0	42	450	280	254	107	108
Sell Oats	0	0	0	0	0	0	0	0	0
Buy Oats	5,516	5,815	7,331	8,294	5,814	7,446	7,595	8,073	8,210
Buy Barley	4,921	4,288	4,592	5,689	6,637	5,525	4,816	6,352	6,404
Hire Labor - Spring	366	206	240	335	490	300	312	473	490
Summer	205	0	42	0	0	0	0	86	117
Fall	369	295	278	349	361	416	374	414	429
Winter	975	894	975	975	545	975	975	975	975
Expected Net Income	17,841	22,366	35,781	30,549	19,389	17,873	21,313	27,532	24,829
Realized Net Income	20,389	30,005	26,610	17,974	17,817	22,384	25,503	24,429	20,265

TABLE LXXXVII

PRODUCTION FACILITIES AND ENTERPRISE MIX

MODEL V - LIMITED CREDIT (TOTAL CAPITAL/TOTAL DEBT $\geq$ 3)

	Initial Endowment	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955
Investments and Construction												
Land	256	369	369	369	411	421	439	500	585	601	601	601
Cattle Buildings -	2,952	2,952	2,629	2,629	2,629	2,745	2,434	2,352	2,693	2,693	2,693	1,540
Improved	0	0	0	0	0	0	0	0	0	0	0	0
Feeder Hog Barns	0	0	0	44	44	85	125	145	145	154	368	537
Farrowing Barn	1,920	1,920	1,597	1,597	1,597	1,597	1,286	1,204	1,204	1,204	1,204	51
New	0	55	55	218	218	218	218	218	218	218	218	218
Improved	0	0	323	323	323	323	634	716	716	716	716	1,869
Rent Pasture												
Production Activities												
Cow-Calf		0	0	0	0	0	0	0	0	0	0	0
Feeder Cattle		125	51	51	52	57	57	77	135	134	65	3
Yearlings		0	0	0	0	26	22	0	76	70	0	60
Stocker Cattle		0	8	0	27	0	0	0	0	34	0	0
Farrow and Finish		0	3	3	3	3	6	7	7	7	7	19
Farrow		19	73	73	73	73	58	37	0	0	55	2
Feeder Hogs		0	0	44	0	84	125	145	99	154	368	537
Cropland Cultivated		369	369	369	411	421	439	500	369	365	53	43
Cropland Rented		0	0	0	0	0	0	0	215	236	548	558
Off-Farm Investment		0	0	0	0	0	0	0	0	0	0	0
Sell Wheat		1,222	1,329	1,329	1,481	1,517	1,583	1,801	1,327	1,316	191	155
Sell Oats		344	0	0	150	0	0	0	0	0	0	0
Buy Oats		0	0	409	0	636	952	829	731	1,252	4,540	5,982
Buy Barley		2,517	2,448	2,692	2,448	3,740	3,683	3,215	5,194	5,372	5,119	5,464
Hire Labor - Spring		95	255	294	285	488	472	381	490	490	469	490
Summer		0	236	272	286	470	456	354	353	320	371	398
Fall		309	341	392	375	540	540	548	543	570	339	348
Winter		616	679	799	679	975	975	975	975	975	975	975
Expected Net Income		7,409	9,818	10,438	11,513	21,448	21,194	23,614	36,014	29,975	28,563	31,508
Realized Net Income		8,554	10,003	11,088	17,777	20,122	22,973	29,715	26,017	24,429	26,959	19,238

PRODUCTION FACILITIES AND ENTERPRISE MIX
MODEL V - LIMITED CREDIT (TOTAL CAPITAL/TOTAL DEBT ≥ 3)

	1956	1957	1958	1959	1960	1961	1962	1963	1964
Investments and Construction									
Land	687	687	687	687	687	737	737	737	737
Cattle Buildings -	1,540	1,489	1,489	1,489	3,448	3,448	3,448	3,448	3,448
Improved	0	0	0	0	0	0	0	0	0
Feeder Hog Barns	537	537	537	560	560	560	560	560	560
Farrowing Barn	51	0	0	0	0	0	0	0	0
New	218	218	218	218	218	218	218	218	218
Improved	1,869	1,920	1,920	1,920	1,920	1,920	1,920	1,920	1,920
Rent Pasture									
Production Activities									
Cow-Calf	0	0	0	0	0	26	16	3	3
Feeder Cattle	77	68	45	54	172	130	82	149	128
Yearlings	20	22	32	21	100	43	0	14	0
Stocker Cattle	73	0	0	0	0	0	0	0	0
Farrow and Finish	19	19	19	19	19	19	19	19	19
Farrow	0	0	0	0	0	0	0	0	0
Feeder Hogs	307	392	484	560	4	156	287	148	226
Cropland Cultivated	515	510	128	142	474	676	676	575	611
Cropland Rented	172	177	559	545	213	61	61	162	126
Off-Farm Investment									
Sell Wheat	1,854	637	461	509	1,704	2,434	2,434	2,071	2,199
Sell Oats	0	0	0	0	0	0	0	0	0
Buy Oats	2,505	4,485	5,399	6,105	349	865	1,834	1,211	1,712
Buy Barley	4,450	4,642	5,199	5,496	6,496	5,191	5,984	4,718	4,439
Hire Labor - Spring	490	303	357	316	490	490	418	348	344
Summer	392	57	130	0	0	0	84	0	0
Fall	632	413	387	427	612	675	632	675	675
Winter	975	975	975	975	651	975	975	975	975
Expected Net Income	21,414	24,023	33,596	30,705	24,878	22,287	22,051	27,169	23,761
Realized Net Income	22,742	30,624	27,628	20,695	20,149	22,436	26,036	23,295	21,301