The Wheat Economy and the Demand for Manufactured Goods, 1910 to 1930: A Quantitative Study

A thesis submitted in partial fulfillment of the requirements for the degree Master of Arts

© Stephen Watson
Department of Economics
McGill University

November, 1980

Abstract

This thesis examines the impact of the expansion of wheat production in western Canada before 1930 on the growth of manufacturing capacity in Canada. The approach is to calculate the purchasing power of prairie farmers between 1910 (before which date statistics are unavailable) and 1930, and then to estimate the demand for manufactured goods. Other sources of demand related to the wheat boom, such as railway investment, are also considered. These estimates are then compared with data on production, exports and imports of manufactured goods to determine the importance of prairie demand. It is found that the prairie market was not large, and in fact was smaller than the export market for manufactures. The conclusion is that the important contribution of the wheat economy to the expansion of manufacturing was limited to the period of rapidly expanding settlement, which ended by 1914.

Abstract

Cette thèse examine l'impact de l'augmentation de la production de blé dans l'ouest du Canada avant 1930 sur le développement des capacités manufacturières du Canada. Nous avons choisi comme approche de calculer le pouvoir d'achat des fermiers de la prairie entre 1910 (on ne dispose d'aucune statistique avant cette date) et 1930, et d'évaluer ensuite la demande de biens manufacturés. D'autres sources de la demande liées au "wheat boom" tels que les investissements dans le chemin de fer sont également prises en considération. Une comparaison est ensuite établie entre ces estimations et les données sur la production, les exportations et les importations de biens manufacturés afin de déterminer l'importance de la demande de la prairie. On découvre que la prairie ne représentait pas un très gros marché pour les manufactures, qu'il était même en fait moins important que le marché à l'exportation. On en conclut que l'économie du blé n'a contribué de façon importante à l'expansion des manufactures que pendant une période limitée, la période de peuplement rapide qui a pris fin en 1914.

Acknowledgements

I am indebted to Professor George Grantham and Professor Tom Naylor, both of whom read the entire draft of this thesis and provided me with excellent critiques. I have learned a great deal from both of them. However, the final version contains numerous changes which neither has seen, and they cannot be held responsible for any errors I have introduced or, indeed, for any shortcomings in the thesis as a whole. In particular, I have made extensive changes and additions to my discussion of Professor Naylor's work in Chapter I. Because he has not seen these revisions, the reader should not assume that Professor Naylor accepts all aspects of my interpretation of his work.

I would like to thank staff of the Agriculture Division of Statistics Canada, Carol Nachtigall, Peter Lys and George Beelen, who were very friendly and helpful during my visit to their office, and who assisted me in determing how various old statistics had been obtained and how they were defined.

I would also like to thank the Department of Economics at McGill for providing me with financial assistance in the form of teaching assistantships. And finally, I must express my appreciation for Mrs. Groulx, Barbara, Christine and Debbie, who always put up with me.

Statement of Original Content

The most important original content of this thesis is the calculation of the purchasing power of prairie farmers and of the market for manufactures attributable to the expansion of the wheat economy. To the extent that these calculations constitute the substance of Chapters II to IV, these chapters may be considered original contributions to knowledge.

Table of Contents

Free Homes
IN
Western Canada

The payment of a nominal office fee at the local Land Agency, and the performance of the very simple settlement duties prescribed by the Dominion Lands Act, will make you the owner of a 160-acre farm on the Public Domain in Western Canada.

Low Railroad Rates for Homeseekers from outside Canada

For Particulars, Pamphlets, etc., apply to

THE SECRETARY,
Department of the Interior,
OTTAWA, CANADA

Or to
The High Commissioner of Canada,
17 Victoria Street,
LONDON, S.W., ENGLAND.

Introduction

The period between the turn of the 20th century and the onset of the Great Depression was a discrete era in the history of the Canadian Prairies. Preceeding periods had been dominated by buffalo hunters, the fur trade, tentative pioneer agricultural settlement and railway building; the ensuing period was dominated by dust and poverty. But the intervening three decades saw a protracted though uneven expansion of dramatic proportions. The population of the prairie provinces increased sixfold, from 400,000 in 1901 to 2.4 million in 1931. By comparison, the total population of Canada did not quite double. In the same period, the area of improved land in the West increased more than tenfold, and production of wheat climbed until, in the record crop year of 1928, Canada accounted for approximately 50 per cent of world wheat exports. In 30 years, 232,900 farms were established and survived.

Given this list of impressive statistics (and it could be lengthened considerably) it is easy to understand why many historians have felt quite comfortable with the assertion, to quote the textbook, that "Canada's whole economic development hinged on this wave of prairie settlement . . . ."[1] Not only is the evidence strong--concurrent expansion of western agriculture and central Canadian manufacturing--but the link can be explained: settlement provided an outlet for investment and a market for manufactures, while wheat exports provided the foreign exchange earnings to finance capital goods imports. Moreover, Canada had acquired Rupert's Land and the Northwest Territories in 1870 precisely because it was expected that the region would provide economic opportunities for the founding provinces. For these reasons, the interpretation of the wheat economy as the driving force of the Canadian economy during all or part of the period 1896 to 1930 has found favour with a majority of historians.

---

1 Easterbrook and Aitken, Canadian Economic History (Toronto: Macmillan, 1956), pp. 484-5.

This interpretation has not, however, gone unchallenged. Some have argued that the wheat economy made only a small contribution to economic development. As well, there is a school of thought which is less concerned with the extent of growth induced by the wheat sector than with the effects of staple production on the structure of the Canadian economy. In Chapter I of this thesis, the literature on the wheat economy is reviewed and these three positions are delineated. In Chapters II and III, quantitative analysis is brought to bear on the topic in a test of the hypothesis that the expansion of the wheat economy prior to 1930 contributed significantly to the growth of manufacturing output in Canada. This is not the same thing as examining the impact of the wheat economy on overall economic growth, but examination of the links with manufacturing provides us with evidence of the effect of the wheat staple on both growth and economic structure. The conclusions are presented in Chapter IV.

Chapter I
Interpretations of the Wheat Economy

The debate about the significance of the wheat economy is part of a larger debate concerning the staple theory of Canada's economic development. On the one side, works such as Buckley's Capital Formation in Canada portray an expanding staple sector as the predominant source of growth in the Canadian economy as a whole. Another group of authors, who are not necessarily opposed to the staple theory--in fact, some of its members are the strongest partisans of the staple approach--emphasize not the growth which the staple sector may or may not have caused, but the political-economic dependence to which reliance on staple exports can give rise. These two views have been termed the "steady-progress" and "dependency" versions of the staple theory, respectivly.[2] A third group has been concerned with criticizing the staple approach, and includes the later Buckley, who argued that focusing too narrowly on staples leads us to ignore other sources of growth, and Chambers and Gordon, who maintain that the wheat economy did not engender growth to other than a small extent.

The dependency version of the staple approach requires some elaboration. There is nothing difficult about the steady-progress version; it is simply the view that, given reasonably favourable circumstances, a country can experience diversified economic development with a staple export sector as the engine of growth. It is more difficult to describe the dependency version. A dependency model of underdevelopment has been worked out by students of Latin America such as André Gunder Frank,[3] and it is the effort to apply some of the insights of this model to the study of Canada that has given rise to the staple-dependence interpretation of Canadian economic history. But while an increasing number of scholars have employed this approach,

---

2 This distinction has been made by Danny Drache in an unpublished paper cited in Mel Watkins, "The Staple Theory Revisited," The Journal of Canadian Studies 12 (Winter, 1977), pp. 83-95.

3 See, as one of many examples, A.G. Frank, Capitalism and Underdevelopment in Latin America (New York: Monthly Review Press, 1969).

especially sociologists,[4] there is as yet no formal statement of a staple theory of dependence. In lieu of a formal theory, we may outline some of the postulates of the staple-dependence approach which seem to be commonly accepted.[5]

1) Reliance on a staple export sector tends to be self-perpetuating as resources are drawn into the production of the staple product that might otherwise have been invested in other sectors. In other words, a staple economy tends not to diversify. (If true, this is at least a partial explanation of why Canada remains a large net exporter of natural resources and a large net importer of manufactured goods.)

2) "New" countries, as no one denies, depend on more advanced countries for markets, capital, technology, and manufactured goods. But as staple production expands without engendering diversified development, this dependence fails to attenuate, and may become more serious.

3) Any given staple good is produced in a particular region, which tends to specialize narrowly in the production of that staple. Such regions become dependent on older and relatively more diversified regions to supply capital and manufactured goods. This facilitates the political and economic control of the older region over the staple-producing region, and may give rise to inequalities. In particular, the staple-producing region is likely to experience more extreme variations in economic activity and lower per capita income.

In this chapter we examine the three basic positions that have been mentioned by discussing in turn the major authors who have written on the wheat economy. The thesis that the agricultural expansion on the Prairies was the prime impetus to Canadian economic development during all or part of the period 1896

---

4 See the recent "Special Issue on Dependency, Underdevelopment and Regionalism" of the Canadian Review of Sociology and Anthropology 17 (August, 1980).

5 For more extensive discussions see Watkins, "The Staple Theory Revisited" and Melissa Clark, The Canadian State and Staples: An Ear to Washington (forthcoming, University of Toronto Press), Chapter II.

to 1930 was elaborated primarily by three writers: W.A. Mackintosh, V.C. Fowke and Kenneth Buckley, their writings on the topic having appeared between 1923 and 1957. The attack on the thesis was initiated in 1958 when Buckley announced that his quantitative work did not necessarily show what he had earlier thought and said it did. This was followed in 1966 by Chambers and Gordon's article against the wheat-staple thesis. More recently, Tom Naylor has argued that expansion of the wheat economy distorted Canada's economic development, and he can be taken as representing the dependency school. We shall also mention in this chapter the work of Harold Innis, Edward Vickery and Robert Baldwin.

W.A. Mackintosh

In a 1923 article, "Economic Factors in Canadian History," Mackintosh set out what was probably the first Canadian statement of the staple thesis, as it eventually came to be known.[6] He argued that "the prime requisite of colonial prosperity is the colonial staple,"[7] and he devoted the bulk of this article to a survey of the successes and failures of British North America in its attempts to develop staple export industries. As the article is a survey, Mackintosh devotes only a page to the settlement of the Prairies, but he argues that the period of prosperity experienced in Canada from 1900 to 1913 was based on wheat: "The world staple primed the pump of Canadian industry."[8]

In the years that followed, Mackintosh carried out several major studies on western Canada.[9] But his major elaboration of the wheat-staple thesis is found in what is also his most famous work, The Economic Background of Dominion-Provincial

---

6 Reprinted in Approaches to Canadian Economic History, ed. Easterbrook and Watkins (Toronto: McClelland and Stewart, 1967), pp. 1-19. Mackintosh cites an American, Guy S. Callendar, as the source of his inspiration.

7 Ibid., p.4.

8 Ibid., p. 14.

9 See Bibliography for a list of these works.

Relations,[10] a study prepared for the Rowell-Sirois Commission and published in 1939. The book begins with a restatement of his thesis that in a new country, progress can only be made if adequate quantities of raw materials can be exported to finance the purchase abroad of important items that cannot yet economically be produced in the domestic economy.[11] However, the point is made by way of explaining the fluctuations in income to which new countries are subject by reason of their dependence on the market for a few commodities. In the remainder of the book, Mackintosh stresses a different aspect of staple production: the investment and inter-regional trade opportunities to which it gives rise.

These opportunities, he argues, were the reason why the Hudson's Bay Company territories were acquired in 1870.[12] Canadians hoped to emulate the rapid growth achieved by the eastern U.S. as that country's western hinterland was penetrated and developed. It was realized that the Canadian economy was too small to permit of much specialization and integration, and that an expansion of the market was necessary. This could have been achieved in two ways: the renewal of Reciprocity with the U.S., or the opening of Canada's own western frontier. In the former case, American co-operation was required, but not forthcoming. The remaining choice was between doing nothing and embarking on the risky plan of prairie settlement. Evidently, the expected returns were perceived to be sufficient to justify the risk.[13]

To ensure that all possible benefits would be realized, the western territories were brought into the confederation on a much different basis than the original provinces. Whereas the

---

10 - (Toronto: McClelland and Stewart, 1964).

11 The Economic Background, p. 13.

12 Ibid., pp. 19-23.

13 The returns were not just those expected from prairie settlement. They included defense considerations and the link with B.C. See Fowke, "National Policy and Western Development in North America," Journal of Economic History 16 (December, 1956), 461-481.

latter had control over the public lands within their boundaries, public lands in the West were appropriated by the federal government, to be administered "for the purposes of the Dominion." On this point, Mackintosh considered it sufficient to cite the interpretation of Chester Martin, a strong critic of the Dominion lands policy, who argued that the 1870 transfer had made Canada "a veritable empire in its own right . . . ."[14] Control over the western lands gave the Dominion government the means to finance a large part of railway construction (primarily by means of land grants to the CPR) and control over settlement policy. In addition to these aspects of the Dominion's strategy, a protective tariff was established as a means, Mackintosh noted, of reserving the western market for the other regions of Canada.[15]

Unfortunately, the nation's hopes were not immediately to be realized. The 1870's and 1880's were a period of protracted depression. But around the mid-1890's the long-awaited expansion finally got underway as a result of a confluence of favourable circumstances (especially low interest rates and rising export prices). Taking population growth as a rough indicator of changing economic conditions (on the grounds that improved conditions induced immigration), there was an increase of only 24 per cent between 1881 and 1901, but a 64 per cent increase between 1901 and 1921.

During the years 1895 to 1920, "the most fundamental single characteristic" promoting economic growth was, according to Mackintosh:

> a high rate of investment induced by improved expectations of profit from the exploitation of natural resources, which had been newly discovered, newly tapped by the extending railways, subjected to new productive techniques, or converted into profit possibilities by favourable shifts in costs and prices. Overwhelmingly most important were the wheat lands of the Prairie Provinces. Prospective profitableness in

---

14 See Bibliography for Martin's works. In The Natural Resources Question he refers to the "definite 'colonial' subordination of the Prairie Provinces." (p. 52)

15 The Economic Background, p.33.

> the exploiting industries created markets for other industries and for a time investment fed on itself. [16]

Further on, Mackintosh also discusses the role of foreign exchange earnings. The Prairies were the export region of Canada while at the same time they had a large trade deficit with the other regions of the country. That is, the prairie population had large export earnings and spent much of it on purchases of goods and services from B.C. and the East. All regions spent a certain proportion of their income on imports from the U.S. and abroad, but Mackintosh does no more than mention this fact. [17] The observation to be made, then, about Mackintosh's analysis is that he attributes the West's economic influence to its role as an outlet for investment and as a market for the goods and services of other regions. He makes no major claims for other possible contributions of the wheat economy, such as the use of export earnings to purchase capital equipment and other items necessary for a specialized economy to make progress; this in spite of the fact that the first paragraph of the book states, as one of "certain generalizations concerning the development of new countries," that raw material exports are necessary for these reasons. While we cannot put words in Mackintosh's book, we may at least offer a rationale on his behalf. This is that, while imports of producer goods, etc. may be necessary, they will not be undertaken unless the importing firms have somewhere to sell the resulting increase in their output. That is, the role of the wheat economy in facilitating the supply of goods and services through its impact on the balance of payments may have been ancillary to its role in increasing aggregate demand.

An additional important point concerns the duration of the stimulus to growth provided by the wheat economy. Mackintosh claimed an important role for the wheat economy only up to 1920. Over the next five years there was an international contraction with the Prairies being particularly hard hit as the price of farm products overall fell by 50 per cent during 1920-23 and the

---

16 Ibid., p. 41.
17 Ibid., p. 52.

price of wheat fell almost 60 per cent during 1920-22. An index of farmers' purchasing power cited by Mackintosh showed a decline of 59 per cent between 1920 and 1924.[18] The West would not likely have engendered much growth in other regions in these years. But between 1924 and 1926 the index of farmers' purchasing power increased 63 per cent, partly due to improved prices but also due to substantial increases in yields and total output. The high yields continued until in 1928 a record output was achieved that was not surpassed until 1952. Prices, however, did not regain their 1920 level. Mackintosh's conclusion is that "the prairie market declined in its relative importance for the rest of Canada in this period."[19]

In summary, Mackintosh sees in the wheat economy a market and a field for investment of major importance between 1895 and 1920, and a market of lesser relative importance from 1925 to 1929. The question arises whether Mackintosh is best classified with the steady-progress or the dependency version of the staple theory. He has been identified as the leading example of the former,[20] but close examination puts the validity of this in doubt. The essence of the steady-progress view is its emphasis on continuing economic development based on staple-export sectors. But the emphasis in Mackintosh's work is on the problems which face a staple economy. In the first place, he notes that a new country will experience hardship until it finds a staple product acceptable to the market of a developed country. And he catalogues all the problems which beset British North America as it sought such a staple. His outline of Canada's history up to the 1850's can hardly be considered a description of steady progress.[21] Second, he points out that the new country has to borrow heavily and and acquires a large debt burden, while the income from the export of raw materials is subject to large variations, so that the country can find itself in serious

---

18 Ibid., p. 73.
19 Ibid., p. 80.
20 Watkins, "The Staple Theory Revisited," pp. 84-5.
21 "Economic Factors in Canadian History," pp. 6-12.

difficulty quite frequently.[22] Third, and perhaps most importantly, Mackintosh recognizes the regional differences which arise when one part of the country tries to benefit from the staple products of another part. As noted above, he quotes Chester Martin's description of western Canada as a colony of the original provinces, and he states further that:

> it was inherent in the facts of development, that as metropolitan centres grew up there should emerge serious conflicts between regional centres and those which extended their influence over the whole Dominion. 23

All three of these points are characteristic of the dependency approach, and belie the Drache-Watkins classification of Mackintosh. In fact, there are few authors who fail to recognize the serious short-comings of dependence on staple production. The notion of a steady-progress version of the staple theory is useful primarily as an analytical ideal type, and only secondarily as a description of the work that has actually been done by Canadian economic historians.

Harold Innis

Innis never devoted more than a few paragraphs at a time to analysis of the wheat staple, but his few comments are worth mentioning here, both because writers of the dependency school claim him as the founder of their school, and because a close look at his work shows that Innis can no more be made to fit neatly into the dependency category than Mackintosh can into the steady-progress category.

The notion that Innis' work is consistent with the dependency approach is based on scattered comments such as the following observation concerning economies based on staple production: "Agriculture, industry, transportation, trade, finance and governmental activities tend to become subordinate to the production of the staple for a more highly specialized manufacturing community."[24] This certainly foreshadows Naylor's thesis

---

22 Economic Background, p. 13.
23 Ibid., p. 21.
24 The Fur Trade in Canada (Toronto: University of Toronto Press, 1970), p. 385.

that expansion of the wheat sector inhibited industrial development by draining away capital that might otherwise have been invested in manufacturing. Furthermore, Innis was particularly aware of the regional inequality that tends to accompany staple dependence. To take one example, he says of the relationship between eastern and western Canada:

> The prairie provinces as producers were controlled from Montreal and Ottawa as they were controlled in the earlier period as producers of fur under the Northwest Company. 25

Such comments can be found here and there in Innis' work, but more pervasive is his analysis of Canada's economic development as the result of the exploitation of a series of staple products. A good example of this is his brief outline of Canada's economic history, "Significant Factors in Canadian Economic Development."[26] Reading such work, one is hard pressed to understand the justification for placing Mackintosh and Innis in opposing categories; the steady-progress and dependency strains are present in both.

In particular, Innis' discussion of the wheat economy hardly differs from that of Mackintosh. He seems to take as self-evident the view (which he repeats in several places without offering any supporting evidence or argument): "the expansion of industry in eastern Canada ... . was largely a result of the opening of the West, especially after 1900."[27] Innis was also aware of some of the problems attending the wheat staple, but certainly not more so than Mackintosh. Thus, while the distinction made between steady-progress and dependency is a useful one, we must be careful not to try to make our predecessors fit into categories, which they themselves did not recognize, for the sake of historiographical neatness.

---

25 Ibid., pp. 400-1.

26 Reprinted in Essays in Canadian Economic History (Toronto: University of Toronto Press, 1956), pp. 156-75.

27 Problems of Staple Production in Canada (Toronto: Ryerson, 1933), p. 100. See also ibid., pp. 20-1, and Essays in Canadian Economic History, pp. 151-2.

V.C. Fowke

V.C. Fowke has discussed his version of the wheat-staple thesis in several books and articles, but the most thorough presentation is in his The National Policy and the Wheat Economy.[28] There are few essential differences between the interpretations of Fowke and Mackintosh. Fowke argues that prairie settlement was an integral part of the National Policy, which developed because of the failure of two preferred alternatives: imperial economic integration and continental economic integration.[29] The inferior alternative was to form British North America into an integrated economic and political unit. The economic integration was accomplished by more than just the tariff structure to which the term National Policy normally applies, and so Fowke prefers to speak of the national policies--uncapitalized and plural--which worked jointly to achieve this end. And because, in Fowke's view, integration and its inseparable concomitant, development, depended on "the exploitation of some vast new area of resources, the establishment of a new frontier of investment," the national policies were designed to capture the benefits of opening the Northwest to economic penetration.[30] These policies included, then, acquisition of western lands and promotion of their settlement, construction of a Pacific railroad, and a system of protective tariffs.[31] The intended beneficiaries were "the commercial and financial interests of the St. Lawrence area."[32]

The significance of the first element of the national policies--settlement--lies for Fowke in the nature of the pioneer settler. In both The National Policy and the Wheat Economy and Canadian Agricultural Policy he argues that the settler

---

28 (Toronto: University of Toronto Press, 1957). See the Bibliography below for his other works on the topic.

29 The National Policy and the Wheat Economy, p. 5.

30 Ibid., p. 8.

31 "The National Policy--Old and New," Approaches to Canadian Economic History, ed. Easterbrook and Watkins, p. 242.

32 Ibid., p. 243.

has always been far from self-sufficient, depending on the market system to sell his products for cash and to supply a wide array of items, so that he has been important to other sectors of the economy in all periods of Canadian history.[33]

But despite the similarity of interpretation, Fowke did make an important contribution. Mackintosh did not provide, in his Dominion-Provincial Relations, much evidence or argumentation to support his assertions about the important role of the Prairies in the Canadian economy before 1920. This was probably because the point seemed too clear to require much elaboration (see page one, above) and because he was writing for a Royal Commission which requested only "a review" of Canada's economic history. Fowke's contribution was, first, to generalize the thesis by arguing that agriculture had been a stimulus to growth throughout Canada's history, and, second, to flesh out the argument in support of the wheat staple thesis.

Fowke's presentation of the argument can be divided into three parts:

a) He discusses in detail the development--from the 1850's--of the idea that the Northwest could be acquired and populated with settlers to the advantage of Ontario, Quebec and the Maritime provinces. He clearly establishes the intent to exploit the economic possibilities of the West.[34]

b) He gives a largely reasoned, as opposed to empirical,

---

33 Canadian Agricultural Policy (Toronto: University of Toronto Press, 1946), pp. 3, 117; The National Policy and the Wheat Economy, Chapter II.

34 In this respect Fowke provides an interesting quotation from a speech by Sir Wilfrid Laurier to the Canadian Manufacturers' Association in Quebec City, 1905: The settlers in western Canada "will require clothes, they will require furniture, they will require implements, they will require shoes--and I hope you can furnish them to them in Quebec--they will require everything that man has to be supplied with. It is your ambition, it is my ambition also, that this scientific tariff of ours will make it possible that every shoe that has to be worn in those prairies shall be a Canadian shoe; that every yard of cloth that can be marketed there shall be a yard of cloth produced in Canada; and so on and so on . . . ." Ibid., p.66.

argument in support of the thesis. This, as has been mentioned, is that the establishment of the wheat economy required a massive capital expenditure on rail lines, elevators, grainaries, barns, houses, farm machinery, tools, etc. This included expenditure on the stores and houses of those who provided services to the agricultural population. In addition, there was demand for consumer goods such as clothing and furniture.[35] The tariff policy was intended to assure that the other regions of Canada were allowed to meet most of the demand for capital and consumer goods.

c) The foregoing argument is supported with a number of statistics, namely: the increases in each of population, the number of farms, improved acreage, wheat production, and the number of tractors, harvester combines and trucks.[36] These data do support the argument, but they are not sufficient to prove that the wheat economy "prompted the investment of billions of dollars not only in the prairie provinces but throughout the entire nation."[37]

It must be admitted that while both Mackintosh and Fowke have done excellent work on the economic history of the Prairies, neither has really proved the wheat-staple thesis. The thesis is plausible, but in the absence of more detailed data on the actual extent of capital and consumer spending in the Prairies, one cannot be certain that the stimulus to central Canadian manufacturing from other sources was not equally or more important. In 1901, 71.3 per cent of Canada's population was resident in Ontario and Quebec. This declined to 60.8 per cent in 1931 which remained, nevertheless, a significant population concentration. The prairie provinces held only 22.7 per cent of the population at this late date which was, as is often noted, a significant increase over the 1901 figure of 7.8 per cent, but was still equal to only a third of the population of Ontario and Quebec. If, as it seems, Mackintosh and Fowke are suggesting

---

35 The National Policy and the Wheat Economy, pp. 71-2.
36 Ibid., Chapter V.
37 Ibid., p. 71.

that the prairie market was important out of proportion to its demographic size, then an argument which takes account of these population differences is required.

Finally, brief mention should be made of Fowke's periodization. He suggests that the investment boom was exhausted by 1913 and that the prosperity of the late 'twenties was based not on wheat alone but on a range of staple industries that were rising to importance, including hydroelectric power generation, pulp and paper, and mining.[38]

Kenneth Buckley as Proponent

Kenneth Buckley's Capital Formation in Canada, 1896-1930 was accepted as a doctoral thesis in 1950 and published in 1955. He describes it in the preface as "a footnote to V.C. Fowke's thesis," which is rather too modest; 'statistical appendix' would have been a more appropriate description, for the book provides the only substantial statistical analysis in support of the thesis. He restates the thesis with less reserve than Mackintosh and Fowke, claiming that the "production of wheat on the Canadian prairie provided the basic economic opportunity in the economic development of Canada from 1896 to 1930."[39] This was so not only because of investment directly in prairie agriculture and in the secondary and tertiary industries which supplied and serviced the farmer, but also because the expansion of these secondary and tertiary industries enlarged the urban population, increasing further the market for their products as well as increasing the demand for residential and commercial buildings, the services of utilities, etc. In other words, Buckley attributes to the impetus of the agricultural frontier economic opportunities several times removed from the economic activity on the frontier. This "leverage effect," not explicitly emphasized in Mackintosh or Fowke, is of primary importance in Buckley's analysis.[40]

---

38 Ibid., pp. 77, 82.

39 Capital Formation in Canada, p. 2. Later in the book he softens this claim, stating: "western expansion was clearly the basic development before 1915 and continued to be a major factor until 1930 . . . ." (p. 54)

Like Mackintosh, Buckley also mentions in passing the supply-side contribution of grain and other primary commodity exports, noting that they enabled Canada to purchase manufactured producers' and consumers' goods, and provided the profits required to attract and service inflows of foreign capital.[41] But Buckley does not bother with an analysis of this aspect of wheat production, giving it, in fact, only half as much space in his book as Mackintosh did (two sentences to Mackintosh's four).

We may consider here a sample of Buckley's data. Of particular interest is a table comparing investment directly attributable to the wheat economy with total investment in Canada. The following figures show the percentage of gross domestic capital formation accounted for by prairie farm investment and investment in railways, combined:[42]

1901-05	30.1%
1906-10	34.6
1911-15	34.9
1916-20	19.7
1921-25	17.3
1926-30	17.8

Prairie farm investment alone accounted for 14.6 per cent of gross domestic capital formation during 1901-15, and 7.9 per cent during 1916-30. There can be no question that the values of 30 to 35 per cent for farm and rail investment together in the first three quinquennium are significant, and that they represented a major stimulus to the economy. But there is a question whether the values of 17 to 20 per cent in the last three periods are adequate to justify the claim to pre-eminent status made for the wheat economy. Certainly the values for prairie farm investment alone--14.6 and 7.9 per cent--suggest that Buckley is correct in resting his thesis on the leverage effect of prairie agricultural expansion rather than on the direct effect of farm investment.

Of farm investment Buckley notes that there was an

---

40 Ibid., pp. 2, 4.
41 Ibid., p. 5.
42 Ibid., p. 9.

extensive and an intensive aspect to its growth. The former term refers to the increase in the number of farms and in improved acreage, which implies an increased demand for farm machinery and equipment. The latter term refers to the increasing capital intensity of farming consequent upon the development of the gasoline engine. From 1901 to 1931 the constant-dollar value of machinery and equipment per worker increased from $342 to $842.[43] However, the increasing capital intensity of prairie farming was not sufficient to balance the decline in the rate of extensive expansion and the increasing importance of other fields of investment, as is evident from the figures given on page 16.

Estimating the investment induced indirectly by the agricultural frontier is a problematic task requiring a very careful interpretation of the data. Buckley's principal efforts in this respect are analyses of urban building and public investment. The former will be considered here as an example.

Buckley's treatment of urban building[44] makes it plain that the relationship between urban building on the one hand, and population increments, population movements, economic opportunities and income, on the other, is too complicated to permit of easy quantification of the links between them. The difficulty is illustrated by considering the period when the causation by the latter of changes in the former seems most obvious. Between 1901 and 1911 Canada experienced a record population increase of 1.84 million. Of this, 1.12 million occurred in the western territories. Half of the western increase--0.58 million--was in urban centres in the West. In the rest of Canada there was no net increase in the rural population, and a 0.68 million increase in the urban population. Thus, 68 per cent of the decade population increase occurred in cities and towns. There can be no doubt that the urban increase in the West was caused by the need of farmers for bankers, grain merchants, retailers, doctors, school teachers, and so on. But was the population increase in the East due to expansion in the West? If

---

43 Ibid., p. 36.
44 Ibid., Chapter 4.

it was then the leverage effect was significant. The analysis of building and real estate activity in Toronto shows that each of four indicators, including the number of building permits per capita, increased sharply and quite steadily from 1896 to 1911. This would show that the investment induced indirectly by the wheat expansion was of no small consequence, but only if the causation could be proven. It was Buckley himself who later pointed out that this last step was missing.

Kenneth Buckley as Critic

Three years after Capital Formation in Canada was published, Buckley criticized his own work and the staple approach:

> It is one thing to assert that a great deal of domestic capital formation was induced by the emergence of the wheat economy and to list some of the regions and industries in which it must have occurred. But when all the measurable capital formation is there before you, the inescapable question is how much of it was induced and where? 45

The problem is clear in the example of the Toronto housing boom above. While we can be fairly certain about the direct impact of the wheat boom--on the farm implement industry, for example--we cannot estimate at all accurately the indirect impact.

But does this justify Buckley's assertion that "it is impossible to determine the contribution of the staple industries to the growth of the national economy in any one period, let alone indicate changes in importance through time" because the relationship between staple industries and industries wholly or partially dependent on them is complex?[46] It is true that the absolute amount of growth in GNP induced by any one sector is an elusive figure, but we can obtain a fair degree of accuracy in determining the relative importance of different sectors. By analyzing the wages and salaries, the profits, the amount of capital, the value added, and other figures readily available by industry, and by analyzing other data such as exports and imports, we can learn a great deal about the relative importance

---

45 "The Role of Staple Industries in Canada's Economic Development," Journal of Economic History 17 (1958), 439-50.

46 Ibid., p. 444.

of each sector's contribution to overall growth; we can estimate each industry's contribution to aggregate demand, determine whether it reduced costs for other industries, examine the amount of savings generated by each industry and where they were invested, etc. It is this approach that is used in Chapters II and III of this thesis to estimate the importance of the wheat economy.[47]

It is actually curious that Buckley should have been pessimistic about being able to determine the importance of staples sectors when the alternative approach he suggests is not significantly different from that employed in Capital Formation in Canada. He calls on economic historians to "concentrate upon what has happened to the measurable dimensions of productive capacity . . . ." This, he notes, is not inconsistent with the staples approach, but he wants to "replace the notion of an opportunity structure determined by geography and natural resources with a general concept of economic opportunity without specifying determinants . . . ."[48] There is a curious inconsistency here. If we are to concentrate on measuring productive capacity, and to do so is not incompatible with the staples approach, then what is wrong with Capital Formation in Canada, which is nothing if not an exercise in measuring productive capacity? It may not have given us a final set of answers about the importance of the wheat economy, but it certainly made a major contribution to the process of obtaining those answers.

The other part of the prescription is problematic as well. When Buckley asks us not to specify determinants, he is asking us to eschew interpretation. Whatever one thinks of the staples approach, one cannot deny that geography and natural resources have had a not inconsiderable effect on Canada's

---

47 As an example of the kind of work that can be done in this line, I am presently studying the history of base-metal refining in Canada, and one of the questions I am trying to answer is whether the establishment of refineries has promoted the development of metal fabricating and manufacturing industries.

48 "The Role of Staple Industries," p. 445.

development. We would not be economic historians, but simply statisticians (not to demean that profession) if we merely measured productive capacity and declined to try to discover how it was influenced by geography, resources, politics, trade, international relations, etc., for all of these things were determinants of Canada's "opportunity structure."

Edward J. Chambers and Donald F. Gordon

In 1966 Chambers and Gordon published a criticism of the wheat-staple thesis which was quite the opposite, in one sense, of Buckley's. In "Primary Products and Economic Growth: An Empirical Measurement,"[49] C-G, far from sharing Buckley's skepticism about the possibility of measuring the impact of the wheat boom, calculated that the boom contributed only 5.20 per cent of the increase in Canada's per capita income over the decade 1901 to 1911. A more generous interpretation of their data raises this figure to 8.40 per cent, but they consider the first to be more accurate.[50]

Their method was to construct a model of the Canadian economy whose principal feature is that it permits an unambiguous measure of the increase in per capita income. This was attained at the cost of several major assumptions. First, they assume a perfectly elastic supply curve of capital, that is, had there been no wheat boom, capital would have found equally or almost equally profitable employment elsewhere. Second, they assume perfectly elastic demand for labour in manufacturing ("gadgets") such that when demand for labour increases in agriculture, the supply curve of labour in manufacturing shifts to the left by an equal amount, labour transfers from manufacturing to agriculture, and wages remain the same. A third assumption is that wages in the economy only increase as a result of exogenous productivity increases in manufacturing. Thus, any possible effect of profits and wages on per capita income has been

---

49 Journal of Political Economy 74 (August, 1966), 315-332.

50 Ibid., p. 316. The authors do state (p. 317) that these are only "rough estimates."

modeled away. There remains only one way for per capita income to increase: increased rents in agriculture. They estimate this increase to arrive at their conclusion that the wheat boom contributed 5.20 per cent to the increase in per capita income.

These assumptions are not innocuous. In the first place, the assumption that wages in both sectors are determined by productivity in one, and that productivity increases are exogenous, leads in turn to the assumption that the rate of wage increase of two per cent a year in Canada during 1901 to 1911 would have occurred with or without the wheat boom, and cannot be attributed to it. On the contrary, as Richard Caves has pointed out, there may well have been an increase in manufacturing productivity via economies of scale as a direct result of the increased demand in the prairie market. As evidence, Caves notes that during 1901-11 the average size of manufacturing firms employing five or more persons increased 16 per cent in Canada as a whole, while the increase was much higher in those provinces most affected by the wheat expansion: 20% in Ontario, 75% in B.C., 100% in Saskatchewan and Alberta, and 145% in Manitoba.[51] Thus, it is possible that all or part of the 1901-11 wage level increase in Canada was related to the expansion of the wheat economy.

A second and related problem is the assumption that per capita income increases solely as a result of technical change. Paul Davenport has presented a critique of neo-classical growth accounting with special reference to C-G,[52] but we will simply note here that historical facts may not be in line with the assumption that technological changes such as the chilled steel plow and Red Fife wheat were solely responsible for increasing the marginal physical product per unit of labour in

---

51 Caves, "Export-Led Growth and the New Economic History," Trade, Balance of Payments and Growth ed. J.N. Bhagwati et al. (Amsterdam: North-Holland, 1971), pp. 408, 411-12.

52 "The Sources of Economic Growth in Twentieth Century Canada," Paper presented to the Seventh Conference on Quantitative Methods in Canadian Economic History, Guelph, February, 1975.

agriculture, which otherwise declined with the extension of cultivation as in Ricardo's schema. Many farmers increased the size of their farms as soon as they could afford to do so, often by acquiring the adjoining quarter section.[53] It seems reasonable to expect (and this is an interesting topic for future investigation) that two quarter sections would provide twice the output and income of one without requiring a twofold increase in capital. Certainly, only one barn would be necessary, and most other capital goods such as draught animals and plows would simply have been used more intensively. In other words, individual farmers may have realized economies of scale, and to the extent that the expansion of cultivation was due to existing farms expanding rather than new farms being established, there would have been an increase in the marginal physical product of capital and consequently an increase in the income of those farmers. Moreover, since farming is skilled work, we would expect the productivity of farmers to increase as they gained experience in cultivating what was, initially, unfamiliar land.[54] It is not unlikely that these two effects increased the per capita income of the farming population significantly.

A third problematic assumption is that capital was in perfectly elastic supply. In reality, the farm family supplied capital and labour jointly, and their decision to establish themselves on the Prairies or expand an existing operation was based on expected total returns, which consisted of rents, a return on capital, and a return on labour. They did not consider the various alternative uses of their capital as a separate item. One cannot assume that capital would have been almost as profitably employed elsewhere. In many cases, it might have been spent on consumption.

Many other criticisms have been made of the C-G article. Gordon Bertram criticized their method of estimating rent and

---

53 See Fowke, The National Policy and the Wheat Economy, p. 60.

54 I owe this point to George Grantham.

derived a new estimate that put the wheat boom's contribution to growth of real per capita GNP at 19.5 per cent for 1901 to 1911.[55] He also extended the period and found that the wheat boom contributed 23.5 per cent of the growth during 1901 to 1921. Moreover, he pointed out that C-G incorrectly used Firestone's pioneering national income estimates instead of Buckley's later, more accurate figures. Employing the latter, C-G's estimate increases from 8.4 to 14.9 per cent, and Bertram's estimate for 1901 to 1911 becomes 34.5 per cent.

Other criticisms have been made by Dales, McManus and Watkins[56] and Richard Caves.[57] Both papers point out that C-G's insistence on measuring intensive growth (per capita GNP) rather than extensive growth is incorrect to the extent that they imply that extensive growth is of no importance. Their analysis does, in fact, say nothing about the wheat economy's effect on extensive growth. As they do not deny that these effects were important, Caves' list of the connections between aggregate and per capita growth suggests the need for modifying their model. These connections include: a) "a negative relation between the rate of expansion of exports and the level of unemployment," b) "a positive relation between the rate of expansion of staple production and the rate of domestic gross saving," and, as mentioned already, c) "a positive relation between the rate of expansion of staple production and the rate of productivity growth in certain domestic sectors, especially manufacturing and distribution." Referring specifically to the expansion of the wheat economy, Caves cites effects not included by C-G: the higher labour force participation rate of immigrants, the economies of scale achieved in manufacturing, capital brought in by immigrants, and induced domestic saving.[58] Each of these aspects of

---

55 "The Relevance of the Wheat Boom in Canadian Economic Growth," Canadian Journal of Economics 6 (November, 1973) 545-66.

56 "Primary Products and Economic Growth: a Comment," Journal of Political Economy 75 (December, 1967) 876-80.

57 "Export-Led Growth and the New Economic History."

58 Ibid., pp. 408-19.

extensive growth has some impact on per capita income.

In general, the problem with C-G is that they have relied on simplifying assumptions to reduce the amount of empirical work they had to do. Their critics have shown that some of those assumptions are false, and that others need more support if we are to accept them.

Tom Naylor

Mel Watkins has claimed Tom Naylor for the dependency school,[59] and although Naylor does not explicitly mention the dependency approach, the classification seems fair. His principal argument concerning the wheat boom is that it had an important deleterious effect on the structure of the Canadian economy. In contrast with the claim that the wheat economy promoted the expansion of manufacturing by enlarging the market, Naylor argues that capital was drawn into the over-expansion of the staple extracting sector, thereby drawing away funds that might otherwise have been invested in manufacturing.[60] He notes, to give one example of his evidence, that in 1913 the Bank of Commerce had a loan/deposit ratio of 182 per cent in the three prairie provinces, and that the ratio of farm loans to farm deposits in Saskatchewan in the same year was 278 per cent. At the same time, the banks were restricting their lending to manufacturers in the East, a state of affairs of which the latter frequently complained. The industrialist Francis H. Clergue, for instance, complained that the "Canadian banks seem to consider those loans to be best which can be made to wheat speculators in Chicago, Minneapolis or Duluth, or the stock speculators of New York."[61]

However, Naylor also seeks to disprove the theory that there was a positive relation on the demand-side between prairie farming and central Canadian manufacturing. He argues that the expansion of wheat exports initially lagged behind the expansion of the economy as a whole, making it difficult to

---

59 "The Staple Theory Revisited."

60 The History of Canadian Business, 1867-1914 (Toronto: James Lorimer, 1975), I, pp. 14-5.

61 Ibid., pp. 104-10.

regard the former as the cause of the latter. He considers 1896 to be the beginning of the broader boom, and points out that wheat production and exports did not begin to expand significantly until 1902, while a sharp acceleration did not occur until 1906. ". . . Obviously," he writes, "business fixed capital formation was not undertaken in anticipation of a boom in wheat exports nearly a decade later."[62] He does consider that the expansion was export-led, but suggests that minerals played the role often attributed to wheat, exports of the former having increased 500 per cent during 1896 to 1901.

This analysis may be criticized on two counts. First, it is not at all obvious that the argument should rest on the relative importance of different export commodities, for exports, whether of prairie wheat or Klondike gold, do not in themselves necessarily directly induce widespread economic growth. As discussed above, foreign exchange earnings can finance capital imports, thereby facilitating supply, but there must be some demand-side reason for increasing supply. An increase in exports by no means necessarily implies an increase in domestic aggregate demand. In particular, to the extent that increased mineral exports were due to the Klondike gold rush, there would have been little increase in the demand for central Canadian manufacturers, not only because prospectors purchased little more than they could carry on their backs, but also because most of this market was supplied from the west coast of the United States. Naylor has argued, however, that the Klondike was important for the boom psychology it engendered, which in turn attracted the attention of foreign lenders.[63] This, no doubt, is true, but it remains that in the absence of an increase in aggregate demand, there would have been no inducement to borrow.

The second problem with Naylor's argument is that it depends on the unsupported assertion that business fixed capital formation increased significantly some years before the upturns

---

62 Ibid., p. 11.
63 Private communication.

in wheat production in 1902 and 1906. Unfortunately, he carefully documents the timing of the wheat expansion while failing to examine the timing of the expansion in other sectors, of which the manufacturing sector is the most interesting and important. Part of the problem is that data on manufacturing are only avaiable for every tenth year, so that we cannot pinpoint the beginning of an upswing. However, there is evidence that the increase in manufacturing output may not have preceeded the wheat boom. Gordon Bertram has calculated the compound rate of growth per year of the gross value of manufacturing output in constant dollars for the years 1890 to 1900 and 1900 to 1910 as follows:[64]

	Total	Primary	Secondary
1890-1900	2.4	3.2	2.0
1900-1910	6.0	5.5	6.2
1870-1957	4.2	3.9	4.3

The last row gives the long-term growth rate. The values for 1890 to 1900 are well below the long-term average while those for 1900 to 1910 are above it. If the last half of the former decade saw a significant increase in manufacturing output, there must have been little or even negative growth in the first half. The following shows what the compound growth rate per year of total manufacturing output would have been during 1890 to 1895 if the rate during 1896 to 1900 had equalled a) the rate for 1900 to 1910, that is, 6.0 per cent, or b) the long-term rate, 4.2 per cent:

	1896-1900	1890-1895
a)	6.0	-1.0
b)	4.2	0.7

All this tells us is that, if we consider it unlikely that during 1890 to 1895 manufacturing output declined by one per cent annually, then it is equally unlikely that the growth of output

---

64 "Economic Growth in Canadian Industry, 1870-1915: The Staple Model," Easterbrook and Watkins, p. 82. The table from which these figures were taken contains a fair number of mistakes, presumably because it was calculated before the advent of electronic calculators. The original data were included in the article, and the figures reproduced here have been corrected where necessary.

during 1896 to 1900 was as high as it was in the decade after 1900. If, as it is somewhat more reasonable to assume, output grew at the low rate of less than one per cent per year in the first half of 1890 to 1900, then growth in the second half would only have been about equal to the long-term average.

Of course, Naylor's case would be strengthened if he wanted to date the manufacturing upswing somewhat later, say 1898 or 1899, which would be reasonable. But it remains that the evidence available to us at the moment does not seem to lend as much support to his position as it does to the wheat-staple thesis since the decade that, except for its first two years, witnessed a boom in agricultural settlement and production also enjoyed an expansion of manufacturing output at a rate well above the long-term average. Note also the fact that the largest difference between the figures for 1890 to 1900 and 1900 to 1910 is in secondary manufacturing, which is consistent with the thesis that the significance of the wheat boom lies in the market it created for the manufacturers who produced for the settlers.

In a subsequent essay Naylor has admitted that the prairie market was important for other regions prior to 1914. He argues, however, that "the prosperity deriving from the opening of the new primary resource frontier was an artificial one, based on construction rather than production . . . ."[65] The term "artificial" would be best replaced by "temporary", but as we shall see in the Conclusion, below, this statement strikes very close to the truth of the matter.

The final question is whether it is not contradictory to accept Naylor's argument that the wheat boom drained away capital from manufacturing, while rejecting his claim that the expansion of the prairie market, at least before World War I, did not promote manufacturing development? The answer is that the wheat expansion was a boon to those manufacturers who had

---

65 "The Canadian State, The Accumulation of Capital, and the Great War," unpublished manuscript, McGill University, May, 1978, p. 2.

the capital to be able to take advantage of the opportunity, and these were mostly large American firms with internal resources to finance branch plant development in Canada.

Edward Vickery

We have referred several times to two possible influences of the wheat economy on the Canadian economy as a whole: increased foreign exchange earnings, and expansion of the domestic market. Edward Vickery has measured the first of these as well as the direct contribution of wheat exports to the growth of GNP.[66] While most of his data are for the last half of the nineteenth century, the analysis does extend to 1912, and his results can be briefly considered here.

Vickery tests for the importance of export earnings by analyzing changes over time in foreign currency receipts, commodity imports, and the composition of imports as between producers' and consumers' goods. The hypothesis is that foreign currency receipts permit the country to import commodities, and the import of producers' goods facilitates the expansion of domestic output. Vickery's data show a sharp rise in the rate of growth of both net foreign currency receipts and total commodity imports between 1893-97 and 1898-1902. There is a further increase in the rate between 1898-1902 and 1903-07, and then a very slight decrease between 1903-07 and 1908-12. During the same periods the proportion of total producers' goods in imports increased from .562 to .585, .633 and .663 respectively. According to Vickery, "it is difficult to avoid the conclusion that big increases in Canada's foreign currency earnings stimulated big increases in imports of capital goods."[67] However, consistent with our earlier remarks on this topic, it is pointed out that Vickery has not proved that increased capital imports were "stimulated", only that they were facilitated.

---

66 "Exports and North American Economic Growth: 'Structuralist' and 'Staple' Models in Historical Perspective," Canadian Journal of Economics 7 (February, 1974), 32-58.

67 Ibid., pp. 44-5.

As for the direct contribution of wheat exports to growth, Vickery multiplies the quinquennial rates of growth of wheat exports by the proportion of wheat exports to GNP and then divides by the rate of growth of GNP to find the percentage of GNP growth attributable to wheat exports.[68] There is some question about the correctness of the figures given,[69] but Vickery finds that during 1903-07 to 1908-12 wheat exports contributed only 4.5 per cent of the growth of GNP (or 8.6 per cent, depending on whether you read the table or the text). Of course, as Vickery points out, this does not give any indication of the full significance of the wheat boom since it omits consideration of linkage effects.

R.E. Baldwin

In a theoretical article which has been fairly influential,[70] Robert Baldwin has argued that wheat-type economies provide a good base for diversified economic development. Baldwin compares two types of newly settled regions: those in which climate favours the production of agricultural commodities usually produced on plantations, and those whose climate favours non-plantation crops such as wheat. The economic difference between the two crop types lies in the nature of their respective production functions. For plantation crops the most efficient methods of production are labour intensive compared with those for the non-plantation crops. There are also substantial increasing returns to scale in production of the plantation crops so that the most efficient scale requires large amounts of capital and labour. On the other hand, crops such as wheat are efficiently produced on the scale of a family farm, and although production is less labour intensive, the capital

---

68 Ibid., p. 51.

69 The quinquennial rate of growth of wheat exports is given as one per cent for 1898-1902 to 1903-07, while for the preceeding period it was 75 per cent and for the subsequent period it was 78 per cent. It does not seem likely that there was such a discontinuity in the early stages of the wheat boom.

70 "Patterns of Development in Newly Settled Regions," The Manchester School 24 (May, 1956), 161-79.

required is not out of reach of the farmer.

Baldwin elaborates further on the differences between such regions, but his principal point is that plantation production requires and obtains large numbers of unskilled labourers who, lacking the skills and the access to capital that would permit them to establish on their own, must accept low wages and who therefore produce much of their own food and durables. However, family farm production attracts skilled individuals with some capital who are able to save and increase their output. In the first case, a small number of plantation owners have a very high income while the mass of labourers earn very little. The level of demand for domestic manufactured products is therefore very low. But in the second case, income is more or less evenly distributed over the entire agricultural population. This generates a much higher level of demand. Thus, the non-plantation type economy provides a strong base on which manufacturing and other industries can establish, and therefore promotes a more rapid and balanced growth than can be achieved by plantation economies.

Parts of Baldwin's analysis are questionable. For example, there is evidence that 'production functions' are not so deterministic as Baldwin suggests. Wheat was produced by the Romans in Libya on large slave plantations, and Arabs produced sugar on individual peasant plots.[71] But Baldwin is mentioned here because, if his theory is correct, then the wheat economy in western Canada should have provided a stable basis for continuing expansion of Canadian manufacturing. Thus, the analysis in Chapters II to IV of this thesis will be a test of Baldwin's theory, or at least of its relevance for Canada.

Conclusion

Throughout this chapter we have referred to two possible contributions the wheat economy might have made to the development of other industries: a) increased aggregate demand,

---

71 I owe this information to Tom Naylor.

and b) financing of capital imports. The latter has received little attention from the authors surveyed here, save Vickery, who found that the effect was significant. Most authors have rested their argument that the wheat boom contributed importantly to manufacturing growth on the fact that the wheat economy extended the domestic market. We have seen that criticisms of this analysis are not convincing. But most authors draw the line marking the end of the wheat economy's principal contribution at 1914. Buckley, however, has argued that the wheat economy was the driving force of the Canadian economy until 1930, and Baldwin provided a theoretical analysis which suggests that the wheat economy should have remained a strong source of growth past 1914.

In the remainder of this thesis we will attempt to measure the extent of the market for manufactures directly attributable to the wheat economy. Data are not available for the years prior to 1910, but we are nevertheless able to test the hypotheses of Buckley and Baldwin. We shall see in the Conclusion that our results have an interesting implication for the staple theory.

Chapter II

The Purchasing Power of Prairie Farmers

The major elements of the national policies--railways, prairie settlement, and tariffs--were designed to rehabilitate central (and eastern?) Canada's economy by establishing a market in the West for the goods and services supplied by the East.[1] We wish to measure the size of that market prior to 1930 in order to test the thesis that the wheat economy did in fact, as well as in expectation, greatly expand the possibilities for at least central Canadian manufacturers.

The variable which interests us is purchasing power, rather than income as it is often measured. The latter, in many studies, includes the imputed rental value of dwellings and the value of farm products consumed on the farm.[2] Neither of these amounts, however, represents anything that a farmer could use to purchase shoes or binder twine, although they do belong in calculations of standards of living.

We cannot measure the full increase in demand attributable to the wheat boom since we cannot calculate the multiplier effect of the expenditures of farmers. (See the discussion of Kenneth Buckley in Chapter I.) But the direct impact of the wheat economy can be compared with the direct impact of other sectors in order to determine its relative importance. In Chapter III the prairie farmers' demand for manufactures will be compared with the export market for manufactures.

Another problem is that the available data only permit calculation of purchasing power as far back as 1910, although the period of most rapid expansion of the wheat economy was during 1902 to 1914. Nevertheless, we shall see in Chapter IV that data for 1910 to 1930 afford us an important insight into the nature of the wheat economy and its impact on the manufacturing industries.

---

1 See Fowke's evidence on this point in National Policy and the Wheat Economy, Chapter Four.

2 For examples of income estimates for U.S. farmers, see the works by Easterlin and Munyon in the Bibliography.

In this chapter, the three principal sources of the purchasing power of prairie farmers are examined: capital brought by immigrants to the West, revenue from the sale of farm products, and debt.

Immigration of Capital

Agricultural settlers in western Canada did not start their farms from scratch. At the beginning they needed cash to purchase the land, the seeds, the dwellings and the equipment without which they could not plant a crop. They could not borrow the money from the banks, since the latter lent only to farmers who had fairly substantial resources of their own already.[3] Even when they did lend, it was primarily for very short terms to finance the harvesting of the crops.[4] Immigrants desiring to start a farm, then, had two choices: they had to work--at railway construction for example--until they saved up the required capital, or they had to bring it with them. Either way, every new farm represented an immediate increment in the size of the market for goods produced in the East.

No accurate calculation can be made of the capital brought to the West by immigrants. But estimates have been made which suggest that the total capital imported in this way was a very large amount. Caves has estimated that during 1901 to 1911 the weighted average amount of capital brought into Canada by immigrants was $153 per person.[5] The number of immigrants who first took up occupation of farms in that decade can be estimated, using data from C-G, at about 245,000, which suggests a total contribution to the capital stock in prairie agriculture of $37.5 million, or $380 per farm owned by immigrants.[6] (It is

---

3 Vere Brown, "Rural Banking Credits: The Functions and Obligations of the Chartered Banks," reprinted from the Grain Growers Guide, n.d. (1916?), pp. 3-4, 11-12.

4 Naylor, History of Canadian Business I, p. 106.

5 "Export-Led Growth and the New Economic History," p. 415.

6 The total population of farms settled during the decade was estimated by multiplying the number of new farms, 147,881, by the approximate number of persons per farm, One-third

not theoretically necessary to exclude Canadian migrants from these calculations, but we do not know how much capital they took with them to the Prairies.)

Contemporary estimates, which may have been rather sanguine, suggest that $37.5 million for the decade is on the conservative side. The Monetary Times thought that, for 1908, it was fair to assume that 58,312 immigrants from the U.S. brought an average of $500 cash, or a total of $29 million for one year from Americans alone. Immigration figures collected at North Portal, Saskatchewan show that in March, 1910, immigrants from the U.S. brought in an average of $1,024 cash per person. A year later the average figure was $1,426. Using The Monetary Times estimate that during the period 1900 to 1911, each American immigrant brought $500 cash, each British immigrant brought $100 and each individual from the Continent brought $10--a weighted average of $216--it is calculated that the total cash brought in by immigrants in that decade was $382,878,000, although not all of these immigrants went into farming. The amount which went into prairie farming can be estimated, (as with Caves' figure, page 33) by multiplying the weighted average amount of cash per immigrant--$216--by the number of immigrants who took up farms--245,000. This suggests a total cash influx to farming for the decade of $52.9 million.[7]

The discrepancy between this figure and Caves' is even larger than it seems, since Caves' figure represents capital,

---

of this product was subtracted to account for migrants from within Canada, which gives us 245,000 immigrant occupiers of new farms. Multiplying this by the average capital brought in per person and then dividing by the number of farms established by immigrants gives the value of imported capital per farm occupied by immigrants, $380. This figure is also obtained by multiplying $153 per person by 2.5 persons per farm. See C-G, "Primary Products . . .", p. 323, for the sources of the data.

7 The Monetary Times, August 14, 1909, p. 710 and August 19, 1911, p. 811. Reprinted in K.H. Burley, The Development of Canada's Staples, 1869-1939: A Documentary Collection (Toronto: McClelland and Stewart, n.d.), pp. 65-9. Readers of thisvolume should note that the table on page 69 contains five errors.

which includes both cash and effects, while the latter figure represents cash only. Including The Monetary Times estimates of the value of settlers' effects--a weighted average of $143 per person--suggests a total capital contribution to prairie farming of $87.9 million. Neither this result nor Caves' has been corrected upwards as they should be to allow for the larger amounts of capital that were brought in by immigrants who intended to purchase farms, as opposed to those who came seeking wage employment. (The value of settlers' effects represents a reduced demand for the products of Canadian manufacturers, except in the case of the cattle or other livestock which many American immigrants brought with them. Many of these would have provided income to their owners starting shortly after their arrival.)

Another source confirms that settlers in western Canada started out with substantial resources. A survey of 2,000 prairie farmers conducted in 1930-31 found that for different periods of initial settlement the average starting capital of the farmers surveyed was as follows:[8]

pre1900	$ 357
1900-05	1,249
1906-10	1,812
1911-15	1,993
1916-20	4,943
postWWI	5,000

The figures for 1900-10 compare with Caves' figure of $380 and The Monetary Times figure of $898 initial capital per farm.[9] The difference between the farmer survey figures and the figures on immigrants is probably attributable to: a) the failure to distinguish between immigrants who could afford to purchase farms on arrival and those who couldn't, and b) the possibly higher average initial capital of migrants from within Canada. With respect to these points, note that the survey figures agree with the immigration figures collected at North Portal,

---

8 R.W. Murchie, Agricultural Progress on the Prairie Frontier (Toronto: Macmillan, 1936), pp. 72-3.

9 The figure $898 was derived by adding the weighted average cash and settlers' effects per immigrant--$216 and $143 respectively-- and multiplying by 2.5 persons per farm.

Saskatchewan, which showed an average cash holding of $1,024 in 1910 and $1,426 in 1911 (page 34, above). Considering where they entered the country, most of these immigrants no doubt intended to establish farms. Moreover, one would expect migrants from within Canada to have resources comparable to those of Americans.

The figures on initial capital from the farmer survey may be used to form a rough estimate of the total cash brought to the West by settlers during the period 1910 to 1930. These figures must be adjusted downwards to correct for three factors. First, the figures were collected from settlers whose farms had survived. It is likely that the many farmers who gave up every year had, on average, a smaller initial capital than their more successful neighbours. Second, part of the initial capital for most farmers included non-cash items such as tools, household goods and in some cases livestock. Third, part of the initial capital was used to buy land, and cannot be included in any calculation of the farmers' demand for manufactures.[10] We do not know what the necessary corrections should be (although with a lot more work decent estimates could be made) so we will arbitrarily take one-quarter and three-quarters of the values of initial capital to be the lower and upper bounds of the likely 'true' amount of initial cash, and multiply the resulting figures by the number of homestead entries in each year. The calculations are presented in Table 2-1.

Income from the Sale of Farm Products

Table 2-2 shows estimates of total farm revenue from the sale of agricultural products in the prairie provinces. The detailed calculation of these estimates is presented in the

---

10 There is no simple answer to the question how much settlers paid for their land, because the regulations governing sales of public land changed from time to time, and because the government, the railways, the HBC and farmers all sold land at different prices. To give an example, though, the average price in 1910 of a 160 acre farm purchased from a railway or the HBC was $2,138, but I do not know how much of this would have been financed by a mortgage. Data are available to study this question, but it has not been attempted here.

Table 2-1

Estimates of the Initial Cash Holdings of Prairie Settlers, 1910 to 1930

	Homestead Entries	Lower Bound ($'000)	Upper Bound ($'000)
1910	41,568	18,830	56,491
1911	44,479	22,151	66,496
1912	39,151	19,497	58,531
1913	33,699	16,782	50,380
1914	31,829	15,851	47,584
1915	24,088	11,996	36,012
1916	17,030	21,049	63,130
1917	11,199	13,842	41,515
1918	8,319	10,282	30,839
1919	4,227	5,225	15,669
1920	6,732	8,321	24,956
1921	5,389	6,736	20,209
1922	7,349	9,186	27,559
1923	5,343	6,679	20,036
1924	3,843	4,804	14,411
1925	3,653	4,566	13,699
1926	4,685	5,856	17,569
1927	5,760	7,200	21,600
1928	7,233	9,041	27,124
1929	16,157	20,196	60,589
1930	17,504	21,880	65,640

Sources: Canada Year Book, 1931, p. 1020; R.W. Murchie, Agricultural Progress on the Prairie Frontier, pp. 72-3. See text for method of calculation.

Table 2-2

Farm Revenue in the Prairie Provinces, 1908 to 1930

	Grain ($)	Animal Products and Livestock ($)	Total ($)
1908	66,139,822	NA	
1909	110,290,846	"	
1910	81,685,013	"	
1911	133,949,122	"	
1912	126,502,702	"	
1913	134,321,389	35,442,000	169,763,389
1914	127,336,209	56,170,000	183,506,209
1915	285,739,366	61,778,000	347,517,366
1916	292,413,366	107,458,000	399,871,366
1917	355,267,610	134,840,000	490,107,610
1918	286,863,190	157,590,000	444,453,190
1919	375,105,640	151,150,000	526,255,640
1920	349,698,086	97,834,000	447,532,086
1921	232,626,810	75,064,000	307,690,810
1922	271,301,389	66,110,000	337,411,389
1923	283,617,858	67,040,000	350,657,858
1924	277,422,036	75,566,000	352,988,036
1925	427,469,598	84,096,000	511,565,598
1926	374,500,229	77,888,000	452,388,229
1927	414,481,930	89,966,000	504,447,930
1928	399,536,181	93,642,000	493,178,181
1929	269,971,275	99,424,000	369,395,275
1930	137,059,251	78,842,000	215,901,251

Source: Appendix, Tables A-2, A-9, A-11, and A-13.

Appendix. For the years 1908 to 1912, no data are available on revenue from animal products and livestock, and so only the revenue from grain sales is given. Extrapolating from the years 1913 to 1930 (during which there was considerable variation in the relative proportions of grain and animal income in total revenue, but no evident trend), animal products and livestock would have added between 20 and 55 per cent of the value of grain to total income.

Prior to 1908, no data on farm income is available except for the Census figures on the value of production.

Debt

The expenditures of prairie farmers were financed not only by the capital they brought with them to the West, and by their revenue from the sale of farm products, but also by borrowing and credit. There was always a high level of debt amongst prairie farmers, and it augmented significantly their purchasing power.

Table 2-3 shows the amounts by which expenditure exceeded income for a large sample of farm families in the years 1929 to 1931. (The survey was conducted over three years, but each family surveyed gave data for only one year.)

The deficits are clearly substantial, and widespread among farmers. In each district some families reported a surplus, but these were offset by the much larger number with deficits. The large variation of deficits between districts--from a low of $155 to a high of $975--was due to two factors: crop conditions and year of survey. The figures for Peace River were collected in a good crop year for that district at the inception of the Depression. Those for Davidson were collected during a year of severe drought, and during the second year of the agricultural depression. Nevertheless, the period 1929-31 came at the end of four prosperous years during which farmers would have paid off much of their debt. (The Peace River-Davidson comparison shows that there is a negative correlation between prosperity and debt.) Thus, the figures in Table 2-3 are not seriously

Table 2-3

Total Expenditure in Relation to Total Income for 1,236 Farm Families in the Prairie Provinces, 1929 to 1931

(average amounts per family)

Districts	No. of Families	Total Expenditure ($)	Total Income ($)	Deficit ($)	Deficit as % of Income (%)
Stable Settlements					
Davidson, Sask.	134	2,707	1,732	975	56
Kindersley, Sask.	204	4,178	3,536	642	18
Olds, Alta.	124	3,227	2,913	314	11
New Pioneer Areas					
Turtleford, Sask.	174	3,195	2,668	527	20
Peace River, Alta.	313	2,762	2,607	155	6
Chronic Fringe Areas					
Medicine Hat, Alta.	287	2,566	2,090	476	23

Source: C.A. Dawson and E.R. Young, Pioneering in the Prairie Provinces (Toronto: Macmillan, 1940), p. 133.

Table 2-4

Sources of Farmers' Debt for Ten Prairie Districts, 1930 to 1931

	Mortgage	Implements	Bank	Store	Other
Percent	74.6	7.7	8.0	1.5	8.3
Range	56.6-84.3	3.1-16.2	3.4-25.0	0.6-2.9	3.5-18.0

Note: The table was derived by taking the average of the values given for ten districts individually. The range gives the highest and lowest value for the ten districts.

Source: R.W. Murchie, Agricultural Progress on the Prairie Frontier, p. 82.

unrepresentative of the period 1910 to 1930 as they would be if they had been collected several years later and farmers would have had an unusually large debt burden after a series of very bad years.

Deficits could be made up in two ways: by selling off capital assets such as livestock and machinery, and by incurring debt. Table 2-4 shows the average proportion of a farmer's debt owed to each of several sources of loans and credit. The total debt for the ten districts represented in the table was $5.74 million, an average of $574,000 per district.

By far the largest item of debt was mortgages on farm property, which did not increase the ability of farmers to purchase manufactures. Similarly, the largest part of bank loans would have gone to finance the harvesting of crops. But the credit from implement dealers and part of the credit from store owners and "other" (which included automobile dealers) assisted farmers to purchase manufactured goods. This credit accounted on average for about 15 per cent of debt.

It is evident, then, that while debt was a major factor in the farm economy, its principal direct effect was on the financial rather than the industrial sphere of the Canadian economy.[11] Nevertheless, farm debt was significant for manufacturers. For 1931, W.A. Mackintosh estimated the total prairie farm indebtedness to implement companies at $49 million, and to stores, automobile dealers and supply companies at $65 million.[12]

---

11 This finding complements Naylor's thesis concerning the separatness of commercial and industrial capital in Canada as elaborated in the History of Canadian Business.

12 Economic Problems of the Prairie Provinces (Toronto: Macmillan, 1935), Chapter 9.

Chapter III
The Significance of the Wheat Boom for Manufacturing

We have estimated the purchasing power of the farm population on the Prairies during the last two decades of the broadly defined wheat boom in order to judge the latter's importance for Canadian industry. The purpose of this chapter is to make that judgement.

It may first be pointed out that the estimates calculated in Chapter II do not cover all the sources of demand for manufacturing output attributable to the wheat boom. The most important additional category is railway construction, which has been treated in detail by Buckley in Capital Formation in Canada.[1] Table 3-1 shows the gross expenditure on railroad construction and on purchases of locomotives, freight cars and passenger cars, whether purchased in Canada or elsewhere.

Table 3-1
Gross Expenditures on Steam Railway Expansion in Canada, 1901 to 1930

	Railroad Construction	Equipment Purchases
	($ million)	
1901-05	124	41
1906-10	381	92
1911-15	537	145
1916-20	253	170
1921-25	253	133
1926-30	389	194

Source: Kenneth Buckley, Capital Formation in Canada, p. 45.

Not all of the expenditure on rail transport is attributable to the expansion of prairie agriculture, and the proportion which is cannot readily be determined. But the wheat economy was certainly the single most important cause of railway expansion until 1915.

A second point to be made before proceeding is that most of the prairie demand for manufactures had to be filled

1 Pp. 42-6.

either by eastern Canadian plants, or by imports (which will be discussed further below). Table 3-2 shows the geographical distribution of manufacturing output by value for the period 1900 to 1930.

Table 3-2

Regional Distribution of Manufacturing Output, 1900 to 1930

(regional manufacturing output as % of national total)

	1900	1910	1920	1930
Maritimes	9.8	7.8	7.0	4.5
Quebec and Ontario	83.1	79.8	78.6	79.8
Prairies	3.1	6.8	8.1	8.7
B.C. and Yukon	4.0	5.6	6.3	7.0

Sources: Census, 1911 III "Manufactures," p. ix; D.B.S. The Manufacturing Industries of Canada, 1930, pp. 12-3.

In the four years listed in the table, the proportion of the Canadian population living in the prairie provinces was 7.8, 18.4, 22.2, and 22.7 per cent, respectively.[2] That is to say, the proportion of the national population resident in the Prairies was always substantially more than double the proportion of national manufacturing output produced there. Moreover, an enumeration of industries by province in the 1911 Census of Manufactures listed only 39 different major manufacturing industries in the prairie provinces, but 189 in Ontario and Quebec.[3] All of this suggests that much more than half of the manufactured products consumed in the West were produced in the East or else imported.

We come finally to the question we set out to answer: how important was the prairie market for Canadian manufactures before 1930? We have, in Chapter II, discussed and as far as possible quantified three sources of purchasing power in the prairie provinces. Unfortunately, several problems arise when we try to measure the prairie market for manufactures. The worst

2 Canada Year Book, 1932, p. 91.
3 Census, 1911 III "Manufactures," Table 1, pp. 2-25.

of these is that we cannot say with any precision how much was spent on manufactures out of the available purchasing power. We may, however, make an informed guess and bound our estimate.

Some idea of the relative importance of manufactured items in the farm family budget can be gained by analyzing Table 3-3, which breaks up the expenditures of a large sample of families. The data are based on the survey conducted during 1929 to 1931 which we have already referred to several times.

Table 3-3

Breakdown of Cash Expenditure of Prairie Farm Families, 1929 to 1931

	% of Total Expenditure	
Farm expenses		45.1
Investment and interest		23.8
Family Living		
Food	13.4	
Clothing	5.3	
Automobile	1.3	
House operation	3.7	
Advancement goods	5.3	
Health	2.1	
	31.1	31.1
		100.0

Source: Dawson and Young, Pioneering in the Prairie Provinces, pp. 137, 148.

Note: The breakdown into the three major categories is based on a survey of 1,236 families in six districts. The breakdown of family living expenditures is based on a survey of 2,011 families in ten districts. The figures are averages of the districts, weighted by the number of families in each district.

Only two items in the table, food and health, entail no direct expenditure on manufactures, if we assume that all the food purchased in the West was processed there. These account for 15.5 per cent of expenditure. All the other categories include both manufactured and non-manufactured items. Farm expense included such things as hired labour, rent, insurance and taxes, as well as manufactures such as binder twine, hardware, fertilizer and equipment repairs involving parts replacement.[4]

One would guess that the former group, the non-manufactured items, were more important, and that manufactured goods accounted for less than half of farm expenses, say one-third.

As for interest and investment, a breakdown is provided for only three of the six districts (these three comprise 545 families) and the relative importance of investment and interest varies widely amongst them (one and twelve per cent, thirteen and twelve per cent, and nine and five per cent, respectively, of total expenditure). However, if we ignore this lack of consistency and calculate the weighted (by number of families) average allotment for interest in the three districts, the figure is 8.3 per cent of total expenditure. This would leave 15.5 per cent for investment. Investment would include new buildings, implements, livestock and land as major items. From census data we know that the value of implements as a proportion of the total value of these four items was as follows:[5]

1911	6.1%
1916	7.6
1921	10.5
1926	12.1
1931	12.7

Multiplying these figures by the 15.5 per cent of total expenditure devoted to investment in 1929-31 suggests that only about one per cent (1911) to two per cent (1931) of expenditure went for implements. This assumes that farmers spent the same proportion of their budget on investment throughout the whole period, but since the value of implements per farm increased during the period, two per cent may be taken as the maximun value. And even if investment amounted to as much as 25 per cent of expenditure in some years, purchases of implements would have amounted on average to only three per cent of farm expenditure.

Returning to family living expenditures, clothing and

---

4 Details of expenditure items obtained from lists in Appendix A of C.A. Dawson, The Settlement of the Peace River Country (Toronto: Macmillan, 1934), pp. 257-261. This appendix is based on the same farmer survey mentioned above.

5 Murchie, Agricultural Progress on the Prairie Frontier, p. 70.

automobiles are manufactured goods, as are advancement goods, which are primarily books and periodicals. However, only a part of the value added of printed material is due to manufacturing. House operation includes furniture, household supplies and fuel, which are primarily manufactured goods, and telephone and electricity, which are not. We may take roughly three-quarters of house operation to represent purchases of manufactures.

Adding up all these estimates, we arrive at the result that roughly 30 per cent of farm expenditure during 1929 to 1931 was accounted for by purchases of manufactured items. There is not much reason to think that this proportion was vastly different in the earlier part of our period. For our purposes, we may say that somewhere between one-quarter and one-half of farm purchasing power was spent on manufactures.

It is not certain whether or not inclusion of debt would have a significant impact on our estimate of farm demand for manufactures. We saw that only about 15 per cent of farm debt was due to manufactures, and in 1931, when debt was probably higher than average, and manufacturing output was down (to two-thirds of the 1929 level) prairie farm indebtedness to to farm implement and auto dealers, to stores, and to supply companies, was only 4.2 per cent of the value of Canadian manufacturing output. Moreover, debt may not represent an increase in purchasing power equal to the full amount of the credit or loan since it must be repaid with interest in succeeding periods, which may reduce demand somewhat in those periods, unless debt-financed purchases by farmers have raised their productivity and income by an offsetting amount. Given that no data are available on debt prior to 1929, it is best to exclude it from our estimates, while recognizing that for some years it would have had the effect of raising our estimates.

Estimating the railways' demand for manufactures due to the wheat boom requires a similar approach. Buckley provides annual data on railway investment, broken down into several categories, but no distinction is made between expenditure on

manufactured products such as rails, and other items such as labour. The exception is purchases of new equipment, which are listed separately.[6] Our procedure is to arbitrarily take 50 per cent of "road construction--net", "road construction--replacement and repair", and "equipment repairs", and 100 per cent of "equipment purchases and replacement" to represent purchases of manufactured goods. The second problem is to estimate the proportion of these purchases attributable to the wheat boom. The extensive phase of railway development, the greater part of it attributable to the wheat boom, ended in 1915. After that date, a large part of railway investment was due to sectors of the economy other than prairie agriculture. Therefore, for the period 1910 to 1915, it is assumed that the lower bound on the proportion of manufactures purchases due to the wheat boom is 75 per cent, and the upper bound 100 per cent. For the years 1916 to 1930, the bounds are 25 and 50 per cent.

The bounded estimates of the demand for manufactures from the three sources discussed above--farm revenue, initial cash holdings of settlers and railway investment--are presented in Table 3-4 as percentages of Canadian manufactured output. It will be observed that the values are quite low. The lower bound of the estimates is never higher than 10.9 per cent and is less than 5.5 per cent in every year after 1916. The upper bound is highest at 20.1 per cent in 1912 and is less than 11 per cent continuously after 1916. If the wheat expansion is to be considered a major source of growth in manufacturing after 1910, the argument must rest on the multiplier effect. However, without trying to guess how large the multiplier effect might have been, it is evident that, at least in the years 1911 to 1915, when the upper bound of the estimate averaged 18.2 per cent, and the lower bound ten per cent, a fairly moderate multiplier would have meant that the wheat boom was indeed very important to manufacturing growth. But it is not likely that this argument can be accepted for the period 1916 to 1930.

---

6 Buckley, Capital Formation in Canada, p. 215.

Table 3-4

The Estimated Market for Manufactures Directly Attributable to the Wheat Boom as a Percentage of Canadian Manufactured Output

	Initial Cash		Farm Revenue		Rail Investment		Total	
	LB	UB	LB	UB	LB	UB	LB	UB
1910	0.4	2.4	2.1	5.4	5.3	7.1	7.8	14.9
1911	0.5	2.8	3.3	8.6	6.0	8.0	9.8	19.4
1912	0.4	2.3	3.1	7.9	7.4	9.9	10.9	20.1
1913	0.3	2.0	3.3	6.6	5.3	7.1	8.9	15.7
1914	0.3	1.8	3.4	6.9	5.7	7.6	9.4	16.3
1915	0.2	1.3	6.3	12.6	4.3	5.7	10.8	19.6
1916	0.2	1.5	4.7	9.4	0.7	1.4	5.6	12.3
1917	0.1	0.7	4.3	8.6	0.8	1.6	5.2	10.9
1918	0.1	0.5	3.4	6.8	0.9	1.8	4.4	9.1
1919	0.0	0.2	4.0	8.0	1.0	2.0	5.0	10.2
1920	0.1	0.3	3.0	6.0	1.1	2.2	4.2	8.5
1921	0.1	0.4	3.0	6.0	1.4	2.8	4.5	9.2
1922	0.1	0.6	3.4	6.8	1.0	2.0	4.5	9.4
1923	0.1	0.4	3.2	6.3	1.3	2.6	4.6	9.3
1924	0.0	0.3	3.3	6.6	1.1	2.2	4.4	9.1
1925	0.0	0.2	4.3	8.6	0.8	1.6	5.1	10.4
1926	0.0	0.3	3.5	7.0	0.9	1.8	4.4	9.1
1927	0.1	0.3	3.7	7.4	1.0	2.1	4.8	9.8
1928	0.1	0.4	3.3	6.6	0.9	1.9	4.3	8.9
1929	0.1	0.8	2.3	4.6	1.2	2.4	3.6	7.8
1930	0.2	1.0	1.6	3.2	1.1	2.1	2.9	6.3

Notes: LB = Lower Bound, UB = Upper Bound. Initial Cash: Calculated by taking .25 of the lower and .5 of the upper bounds from Table 2-1 as a percentage of Canadian manufactured output. Farm Revenue: Lower Bound is .25 of the values in Table 2-2, taken as a percentage of manufactured output. Upper Bound is .5 of those values as a percentage of manufactured output. Rail Investment: Calculated by taking .5 times the value of road construction investment ("net" and "replacement and repair" in Buckley's Table J) and adding the full value of both net equipment purchases and equipment replacement, plus .5 times the value of equipment repairs. This sum is taken as a percentage of manufactured output, after it is multiplied by the bound coefficients, .25 and .5 for 1916 to 1930, and .75 and 1.0 for 1900 to 1915.

Sources: Tables 2-1 and 2-2; Buckley, Capital Formation in Canada, p. 215; D.B.S. The Manufacturing Industries of Canada, 1930, pp. 12-3; Canada Year Book, 1931, pp. 406-9.

So far, imports have been ignored in this analysis. They must now be introduced since, to the extent that prairie demand for manufactures was met by imported goods, the impact on Canadian manufacturing would have been the less. Table 3-5 shows the value of imports and exports in the period under consideration, and also gives these values as a percentage of Canadian manufactured output.

Two major points become evident from a comparison of Tables 3-4 and 3-5. The first is that the volume of manufactured imports was very large throughout the period, in spite of the high tariffs. Imports were never equal to less than 19.2 per cent of Canadian manufactured output, and in 1912 they reached almost 39 per cent. Assuming, first, that these imports penetrated all parts of the Canadian market more or less equally, the proportion of Canadian manufactured output which could have been sold in western Canada is reduced substantially. On the other hand, even if the larger part of these imports consisted of capital goods supplied to central Canadian manufacturers, the multiplier effect of prairie purchases would have been weakened. Moreover, imports reached their highest level relative to domestic manufactured output in those years, 1910 to 1913, when wheat boom-related demand as shown in Table 3-4 was at its highest. This suggests the possibility that increases in Canadian demand for manufactured goods were met more by increased imports than by increases in domestic capacity.

The second point is that exports accounted for a large part of the market for Canadian manufactures. Exports as a percentage of manufactured output were greater than our lower estimate of wheat boom demand for manufactures in every year, and greater than our upper estimate after 1915. Considering that a fair proportion of prairie demand was met by imports, and that there is a multiplier effect for export sales just as there is for domestic sales, it appears likely that after 1915 the export market was more important to Canadian manufacturers than the market engendered by the wheat economy. The same might be true of the period before 1916.

Table 3-5

Exports and Imports of Manufactured Goods, 1910 to 1930

	Imports ($'000)	As % of Manufac. Output (%)	Exports ($'000)	As % of Manufac. Output (%)
1910	315,528	27.1	143,939	12.3
1911	360,343	29.9	144,823	12.0
1912	483,678	38.8	164,087	13.1
1913	441,109	34.2	180,891	14.0
1914	301,486	22.5	204,998	15.4
1915	316,042	22.9	403,283	29.2
1916	482,719	22.7	683,134	32.1
1917	551,913	19.2	877,718	30.6
1918	NA		NA	
1919	771,590	23.5	796,621	24.2
1920	931,499	24.7	663,396	17.6
1921	531,355	20.6	410,869	16.0
1922	574,551	23.2	515,173	20.7
1923	639,343	23.0	591,829	21.3
1924	576,031	21.4	591,598	22.0
1925	681,462	23.1	695,325	23.6
1926	NA		NA	
1927	825,147	24.3	648,177	19.1
1928	975,194	26.1	702,314	18.8
1929	959,996	23.8	690,903	17.2
1930	690,105	20.1	494,561	14.4

Notes: NA = statistics not published for that year. Manufacturing output data are for calendar years, while import and export figures are given for years ending March 31. Thus, the trade figures given in the source as being for a given year are calculated as a percentage of manufactured output in the previous year. For example, the exports and imports for the year ending March 31, 1924 are compared with the manufactured output data for the calendar year 1923. The dates in the table above refer to the manufacturing data.

Sources: Canada Year Book, various years.

Chapter IV
Conclusion

When I first set out to conduct this research, I expected to provide evidence in support of the thesis that, in the words of Kenneth Buckley: "The production of wheat on the Canadian prairie provided the basic economic opportunity in the economic development of Canada from 1896 to 1930."[1] To my surprise, I produced evidence which calls this thesis into question. In data for the period 1910 to 1930, we have seen that the export market was probably more important to Canadian manufacturers than the prairie market in every year after 1915, and possibly in the years 1910 to 1915 as well.[2] More detailed analysis of the manufacturing industries and of export and import data is required, but it may be possible to show that the oft made distinction between the staple export sectors and the domestic-market oriented manufacturing sector is a dubious one. Perhaps the entire economy was export oriented.

The data presented in Chapters II and III do not cover the whole of the period typically associated with the expansion of prairie agriculture. In fact, the period of most rapid expansion, from perhaps 1896 until 1914, when the impact on central Canadian manufacturing would have been greatest, has largely been omitted due to the lack of data. This means that the Buckley thesis may yet be valid for the earlier part of the wheat expansion. In fact, it was argued in Chapter I that the authors who have supported the thesis are more persuasive than those who have criticized it, as far as the period up to 1915 is concerned. Table 4-1, showing the average annual percentage increase in the number of farms and in the number of acres of improved land, shows how important it is to distinguish between the earlier and the later parts of the era of western settlement.

---

1 Capital Formation in Canada, p. 2. See also Fowke, The National Policy and the Wheat Economy, pp. 71-2.

2 Above, pp. 47-50.

Table 4-1

Average Annual Percentage Increase in the Number of Farms and in the Area of Improved Land, Prairie Provinces, 1901 to 1931

	Number of Farms	Area of Improved Land
1901-11	26%	31%
1911-16	2	10
1916-31	2	5

Source: Census data reprinted in Fowke, The National Policy and the Wheat Economy, p. 73.

The expansion of the wheat economy was many times more rapid in the decade 1901 to 1911 than in the succeeding 20 years. Moreover, the extensive phase of railway investment ended by 1915. Thus, if it has been shown that wheat was not the "basic economic opportunity" after 1915, it nevertheless has not been disproved that it was the basic economic opportunity before 1915.

Still, the implication of this result is interesting. For it seems that if the wheat staple had an important effect on the demand for Canadian manufactures, that effect was confined primarily to the phase of rapid expansion of prairie settlement, and that once the rate of expansion slowed down, the prairie market subsided into relative unimportance, even though wheat production and exports continued to grow.[3] There is nothing new about drawing the line marking the end of the wheat boom at 1914--in fact, Buckley is in a minority in extending it to 1930--but what this says about the staple theory needs emphasizing. In the formal presentation of the theory, economic development is seen as "a process of diversification around an export base . . . ."[4] But the case of wheat suggests that mere exports are not sufficient; for the contribution of the wheat economy to diversified growth, if any, was limited to the period of

3 Between 1901 and 1911, Canadian production of wheat increased from 55.6 to 230.1 million bushels. By 1928, output was 566.7 million. Fowke, National Policy and the Wheat Economy, p. 75.

4 Watkins, "A Staple Theory of Economic Growth," Approaches to Canadian Economic History, p. 53.

rapid expansion of prairie settlement. The possibility of exporting wheat is what gave rise to settlement, but once the rate of settlement slowed down and the Prairies became merely an export region, wheat exports ceased to be a base for the growth of manufacturing. The implication is that a staple industry may provide at best a relatively short, one-time stimulus to the economy. If all staple industries exhibited such characteristics, then any economy attempting to develop on the basis of staple exports would require a fortuitously timed succession of them.

Of course, few staples are like wheat.[5] But Canada's other staples have generally been worse than wheat from the point of view of economic development. The fur trade made only a marginal contribution to the cause of diversified economic development, and may actually have militated against it. Fish and timber were hardly better. Wheat has been seen by some as the staple product par excellence. R.E. Baldwin, as we saw in Chapter I, has made much of the characteristics of wheat-type production.[6] Thus, if even wheat proves to be an unsatisfactory basis for diversified economic development, we are led to the conclusion that if, in the words of Mackintosh, production of a staple commodity was the "goal of colonial existence,"[7] then the goal of a country which aspires to a higher level of development must be to dispense with dependence on staple industries to the greatest extent possible.[8]

---

5 Hydro-electric power generation, with its massive initial capital expenditures and low operating costs, would have a similar one-shot impact on demand. The argument could possibly be made that the mining industry as well is in the same category as wheat.

6 Others, such as Easterbrook and Aitken, have emphasized the similarities of a negative character between wheat and preceeding staples, such as heavy fixed costs and frequent fluctuations in price. Canadian Economic History, p. 477.

7 "Economic Factors in Canadian History," p. 12.

8 There is perhaps some irony in the fact that, after criticizing Chambers and Gordon rather severely in Chapter I, we have arrived at the same conclusion as they. See "Primary Products and Economic Growth," p. 316.

This conclusion is founded on a consideration of only one of the possible contributions of the wheat staple to economic development. It is possible that wheat was important in other respects, the most notable being the role of export earnings in facilitating the import of capital goods.[9] Nevertheless, this monograph provides some support for the dependency version of the staple theory as against the steady-progress view,[10] which were discussed in Chapter I. Canada, it would seem, has not developed because of her reliance on staple industry, but in spite of it. Or, looking at it from another point of view, Canada's continuing relative dependence on manufactured imports may be due to its reliance on various staple industries to fuel development.

9 See the discussion of Vickery, above, pp. 28-9.
10 It was Tom Naylor who first pointed this out to me.

Appendix

Calculation of Income from the Sale of Farm Products

The Dominion Bureau of Statistics (D.B.S.) began calculating the income of farmers for the year 1926. These figures are published in the Handbook of Agricultural Statistics, Part II: Farm Income[1] (hereafter, Farm Income). For earlier years, all that is available is the census value of farm output for every fifth year and, from 1918, the "Estimated Gross Agricultural Revenue," published (usually in March) in the Monthly Bulletin of Agricultural Statistics[2] (hereafter, EGAR). As is evident from Table A-1, the figures in the latter two sources are not an adequate proxy for farm income. (Reasons for the differences in these figures are discussed below.)

Table A-1

Comparison of Farm Cash Receipts Estimates from Farm Income with Census Value of Farm Production and EGAR, Prairie Provinces, 1920 to 1930

($'000)

	Farm Income	Census	EGAR
1920		625,975	720,005
1925		739,133	771,065
1926	547,237		765,011
1927	524,336		863,986
1928	620,439		843,153
1929	491,847		642,022
1930	268,072	336,292	445,874

Sources: Farm Income, pp. 50-55; Census of Agriculture, 1931, pp. 536-7, 588-9, 660-1; Canada Year Book, 1929, p. 273; Monthly Bulletin of Agricultural Statistics (March, 1922), pp. 86-7; Ibid., (March, 1926), pp. 64-5; Ibid. (March, 1932), pp. 60-1.

In this appendix an attempt has been made to estimate farm cash income for years prior to 1926. As discussed below, it is believed that the estimates for grains are quite accurate. The estimates for animal products and livestock are much less reliable, but since grains accounted for two-thirds to more than four-fifths of agricultural income in the Prairies, depending on

1 D.B.S. catalogue number 21-502.
2 D.B.S. catalogue number 21-003.

the year, the estimates of total agricultural revenue are probably reasonably accurate. The error is almost wholly on the side of underestimation.

Grains

Five crops--wheat, oats, barley, rye and flax--account for almost all the grain grown on the Prairies in the period under consideration. All others combined amounted to only a tiny fraction of total output of grains, and are ignored here.

The data come from a wonderfully detailed D.B.S. annual publication entitled Report on the Grain Trade of Canada.[3] The Report includes such statistics as the amount in storage at each terminal and at interior elevators, weekly rail movements, receipts and shipments along each spur line, weekly prices for each grade, transportation rates, and even the amount of grain lost in cleaning. The Report was first published in 1918, covering the 1917 crop year. Data from 1908 to 1916 are from the much less detailed D.B.S. publication, Handbook of Agricultural Statistics, Part I: Field Crops, 1908-1958.[4] To the extent that they overlap, the figures in both sources agree. The advantage of the Report is that the high level of detail made it possible to check many of the figures for consistency and accuracy, and to see how some of them were derived.

The calculations of income from the sale of grains, presented in Table A-2 (pp. 68-90), were made as follows. The volume of physical production in bushels for each of the three provinces was multiplied by the average farm price realized in each province to obtain the gross farm value. It was important that the prices used in this calculation be derived so as to take account of the following:[5] a) approximately three-quarters

---

3 D.B.S. catalogue number 22-201.

4 D.B.S. catalogue number 21-501.

5 Technical information about the grain trade is based on G.E. Britnell, The Wheat Economy (Toronto: University of Toronto Press, 1939); Fowke, The National Policy and the Wheat Economy; and D.A. MacGibbon, The Canadian Grain Trade (Toronto: Macmillan, 1932).

of each crop was sold in the fall, so prices for the rest of the year cannot be given equal weight in calculating the average, especially since prices differed widely from one part of the year to another; b) prices varied according to grade; c) the farmer received the market price minus charges for dockage (grain lost in cleaning and transport), elevation, transportation, and several other things; and d) transportation charges were higher for farmers located farther from terminals. The farm prices given in Table A-2 are in fact averages appropriately weighted to take account of all these factors. This was checked by partially reproducing the calculation of farm prices for one year chosen at random (1925) using monthly prices of each of the three highest grades, monthly sales, average rail costs in the three provinces, and an estimate of dockage, elevating and similar charges. The result was higher than the weighted average farm price for the three provinces by six per cent ($1.18 vs. $1.11), which is accounted for by the fact that the lower priced grades, comprising one-third of sales, were not included in the calculation. This check was only made for one year since the calculations required over two hours to complete. The importance of using the farm price described here instead of average annual market prices is illustrated by Table A-3. For the sample years in the table, the average of the market prices was 47.9 per cent higher than the average of the farm prices.

The next step was to sum the gross farm value for the three provinces and multiply the result by a coefficient representing the proportion of the crop which was marketed rather than being used as seed or animal feed, or which was lost in cleaning or was unmarketable. It was not possible to derive a separate commercial coefficient for each province, and it could not be assumed that the aggregate coefficient would be accurate for any particular province. For example, it is likely that in Alberta, where there was more livestock, the amount of grain retained as feed was higher than in Saskatchewan or Manitoba. Data on the commercial proportion was not available for years prior to 1917. For the years 1908 to 1916, the coefficients in Table A-2

Table A-3

Comparison of Farm Prices and Market Prices for Wheat, Prairie Provinces, 1925 to 1929

($)

	Market Price[1]	Farm Price[2]
1925	1.685	1.106
1926	1.512	1.072
1927	1.462	0.979
1928	1.463	0.778
1929	1.240	1.145

1. Simple average price of No. 1 Northern wheat at the Lakehead.

2 From Table A-2, weighted by the amount of wheat produced in each province.

Sources: Canada Year Book, 1929, p. 247; Ibid., 1930, p. 242; Table A-2.

are the averages for the years 1917 to 1930. Figure 1 shows how the commercial proportion of the wheat crop has varied from year to year. There is no evident trend. A comparison of these changes with changes in the farm price (Figure 2) shows at best a very rough correspondence. Prices seem to have some bearing on changes in the commercial proportion, but not enough to allow us to make a reliable extrapolation. Therefore, only the simple averages have been used. These are reprinted, along with their standard deviations, in Table A-4.

Table A-4

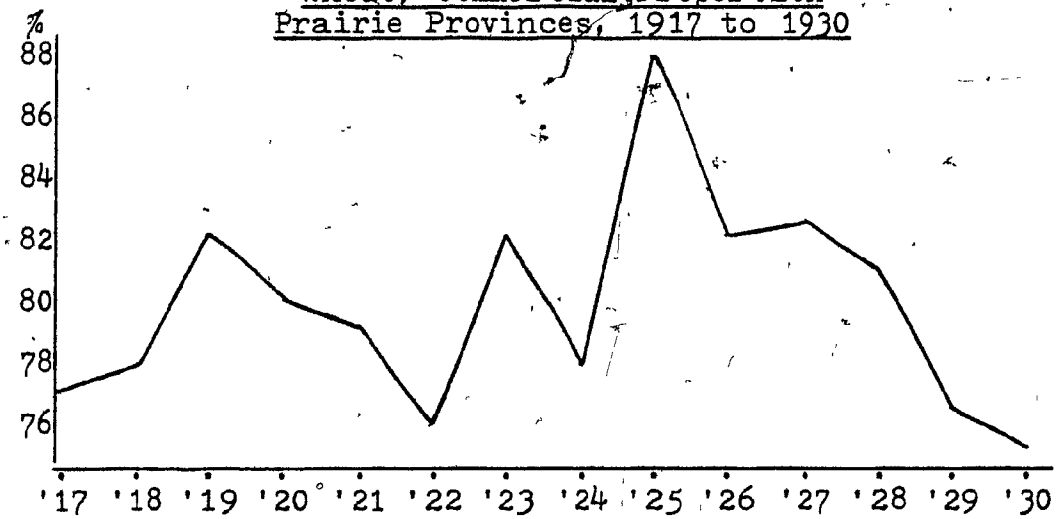
Commercial Proportion of Crops, Prairie Provinces, 1917 to 1930

	Mean Commercial Proportion, 1917-30	Standard Deviation
Wheat	.8002	.0343
Oats	.1444	.0647
Barley	.3239	.0815
Flax	.7567	.1509
Rye	.4862	.2034

Source: Table A-2.

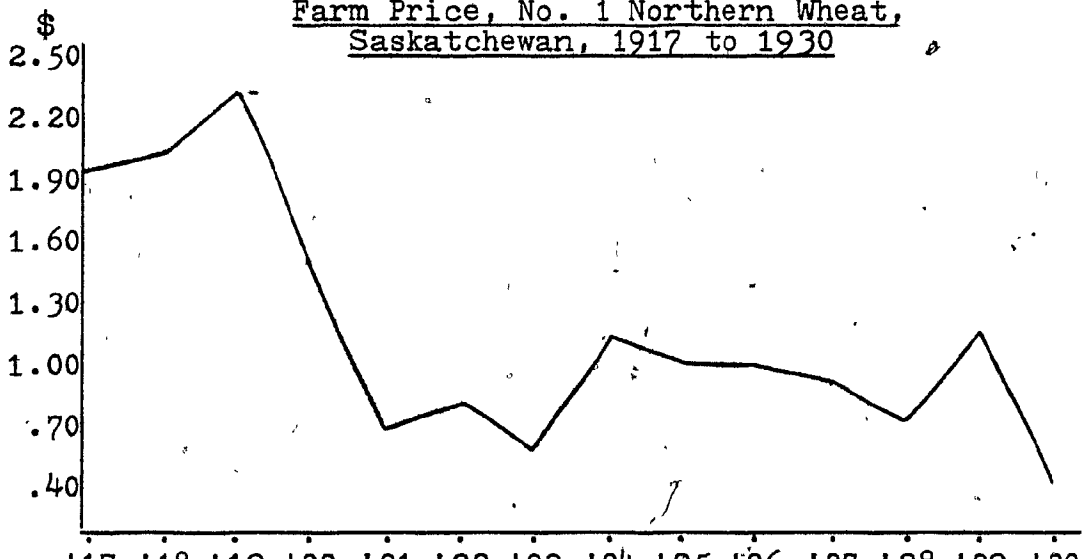
The figure which results from the above series of calculations appears in the last column of Table A-2, and is the aggregate cash income of prairie farmers from the sale of each grain, net of off-farm expenses such as transportation, but

Figure 1
Wheat, Commercial Proportion
Prairie Provinces, 1917 to 1930



Source: Table A-2.

Figure 2
Farm Price, No. 1 Northern Wheat,
Saskatchewan, 1917 to 1930



Source: Table A-2.

gross with respect to on-farm expenses such as fertilizer and labour. The last column is summed to give the total farm income from grain sales in each year.

These results can be partially tested for accuracy by comparing the values for 1926 to 1930 with those in Farm Income. Table A-5 shows the difference between the estimates of farm cash income from wheat in Table A-2 and in Farm Income.

Table A-5

Comparison of Income from Wheat in Farm Income with "Farm Income" from Wheat in Table A-2

($'000)

	Farm Income	Table A-2	% Difference
1926	389,330	334,380	16.43
1927	364,543	367,682	-0.85
1928	441,760	345,295	27.94
1929	322,845	247,462	30.46
1930	157,833	118,270	33.45

Sources: Farm Income, pp. 50, 52, 54; Table A-2.

Except for 1927, the estimates differ substantially. However, there seems to be an adequate explanation for the difference. The estimates in Table A-2 were obtained by multiplying the gross farm value of output by a coefficient representing the commercial proportion of the crop. Apparently, a similar procedure was not followed in arriving at the Farm Income estimates. In Table A-6, the gross farm value of wheat from Table A-2 (i.e. unadjusted for the non-commercial proportion) is compared with the income from wheat figures in Farm Income (the same figures used in Table A-5).[6]

Table A-6

Comparison of Income from Wheat in Farm Income with "Gross Farm Value" of Wheat in Table A-2

($'000)

	Farm Income	Table A-2	% Difference
1926	389,330	408,278	-4.64
1927	364,543	445,405	-18.15
1928	441,760	424,039	4.18
1929	322,845	322,384	0.14
1930	157,833	157,378	0.29

Sources: Same as Table A-5.

The comparison shows that in four of the five years the Farm Income estimates and those from Table A-2, when the non-commercial proportion has not been netted out, are very close, especially for 1929 and 1930 when the differences are negligible. The larger difference in 1927 could possibly be due to an error somewhere in either of the estimates, although the calculations in Table A-2 were re-checked.

The figures for other grains could not be reconciled so easily. The proportion of oats and barley sold commercially was very low, and some allowance would have to have been made in Farm Income. However, the allowance was evidently not the same as the one used in this appendix (which was taken from the Report on the Grain Trade of Canada). It seems clear, nonetheless, that differences in the treatment of the commercial and non-commercial proportions of the grain crops account for the differences between the two sets of estimates.

It is useful also to explain the differences between the data from the Report on the Grain Trade used in calculating Table A-2 and the data in EGAR and the census. The results in Table A-2 cannot themselves be directly compared with the figures in EGAR and the census because Table A-2 estimates farm cash receipts while EGAR and the census estimate the value of farm output. However, the Report does contain an estimate of the gross value of each crop, and this can be compared with the other two sources.

The value of field crops as reported in EGAR is greater than the same statistic in the Report by an average of 11.0 per cent for the years 1918 to 1930. (The range of difference is from 5.0 to 16.8 per cent.) The data in EGAR were obtained in part from forms mailed to farmers, only 20 to 25 per cent of whom returned the forms. The areas harvested were estimated from

---

6 The reader will recall that our object is to calculate purchasing power whereas the Farm Income estimates include all forms of income, whether or not they represent purchasing power. Thus, the non-commercial proportion of the grain crops may fairly be considered income for the latter purpose since farmers consumed most of that proportion as seed, animal feed, or food.

these returns, and then multiplied by the average yields per acre as reported by the Dominion government's crop correspondents. There is no indication of what prices were used to arrive at the value of output.[7] The EGAR figures, then, are rather rough estimates, likely to contain a substantial element of error. Moreover, the figures do not include any distinction between commercial and non-commercial proportions.

The data in the Report, on the other hand, were based on observations of grain movements, and although total production cannot be determined in this way since some grain is retained by farmers, data on grain shipments can be used to corroborate production figures. For the years 1922 to 1930[8] the difference between the quantities of wheat produced and the quantities shipped or in storage amounted to an average of only 3.4 per cent--a satisfactorily small error.

The value of field crops as given in the Report also differs from the census value for every fifth year. For 1920 and 1930 the values in the Report exceed those in the census by 13.1 and 14.5 per cent, respectively, but for 1925 the value in the Report is smaller than that in the census by 2.5 per cent. In part, the explanation may be that the data in the Report are based on crop years, which ran from August 1 to July 31, while the census is based on a calendar year. Furthermore, the data in the census were obtained directly from farmers by census takers, but few farmers kept accurate records, or any records.[9] Therefore, the figures in the Report, based on or checked against observations of grain movements, are likely to be the more accurate.

---

7 Monthly Bulletin of Agricultural Statistics (March, 1922), p. 89; Canada Year Book, 1933, pp. 226-27.

8 The appropriate statistics were not available to make this calculation for earlier years.

9 R.W. Murchie reported that the "Canadian Pioneer Problems Committee offered cash prizes in each province [circa 1929 to 1930] for the best set of financial records. The response was very meagre and only 15 sets of records could be said to be accurate accounts." Agricultural Progress on the Prairie Frontier (Toronto: Macmillan, 1936), p. 74.

Animal Products and Livestock

The statistics on grain are detailed enough, for the most part, to permit us to reconcile or explain discrepancies between sources. The same cannot be said for animal products and livestock statistics, and the results here are little better than informed guesses. This does not mean that the estimate of total income will have a similarly large error since grains, the data on which are much more accurate, accounted for the largest part of total income by a large margin. Table A-7 shows what proportion of total farm income was derived from grains (column A) in the period covered by Farm Income. The table also shows the proportion by which the estimate of total income would have been off if the animal products and livestock figures in Farm Income had been greater than they actually are by 10 per cent (column B), 25 per cent (column C), or 50 per cent (column D). The assumption is that the estimates of income from grain are correct.

Table A-7

Income from Grains as a Proportion of Total Income from Farm Products in the Prairie Provinces, and Estimates of the Error in Total Income Resulting from Errors in Animal Products and Livestock Income, 1926 to 1930

(%)

	A GI/TI	B 10%	C 25%	D 50%
1926	78.3	2.2	5.4	10.9
1927	80.1	2.0	5.0	9.9
1928	78.9	2.1	5.3	10.6
1929	70.1	3.0	7.5	14.9
1930	61.0	3.9	9.8	19.5
mean	73.7	2.6	6.6	13.2

Notes: A is Grain Income as a percentage of Total Income. The grain income figures from Table A-2 were substituted for those from Farm Income for reasons discussed above, pp. 60-1. B, C, and D are the proportions by which the estimate of total income would have been off if the animal products and livestock figures had been too large by 10, 25 and 50 per cent, respectively.

Sources: Farm Income, pp. 50-5; Table A-2.

The errors are satisfactorily small. The largest error--19.5 per cent-- occurs in 1930 when grain accounted for the smallest proportion of prairie farm income ever, and with the assumption that livestock and animal product income figures are off by 50 per cent. Thus, 20 per cent can probably be taken to be the extreme boundary of error on the total income estimates.

There are several problems with the animal products and livestock figures. One is that detailed, year-by-year statistics are only available for some of the products in this category. Another is that there is a wide divergence between the sources, and since the data are less detailed and complete, it is not possible to identify the reasons for the differences, as was possible with the grain figures. Table A-8 shows the income from animal products and livestock for 1920, 1925 and 1930 from three different sources.

Table A-8

A Comparison of Income from Animal Products and Livestock in the Prairie Provinces from Farm Income, the Census, and EGAR, 1920, 1925 and 1930
($'000)

	Census	EGAR	Farm Income
1920	118,694	105,710	
1925	108,196	146,093	
1930	99,868	136,361	86,957

Sources: Same as Table A-1.

A further problem is that it is not possible to separate sales to the public and sales of live animals from one farm to another. For the purpose of calculating the purchasing power of farmers as a whole, the latter item should not be included. Lacking evidence on this point, we shall proceed on the assumption that inter-farm sales of animals represented a small fraction of farm income.

The estimates of income from animal products and livestock have been constructed as follows. Data on the value of cattle on farms are available from 1913 on. Following the method used by D.B.S. in arriving at EGAR,[10] one-fifth of the value of

10 Monthly Bulletin (March, 1922), p. 89.

cattle other than milch cows has been taken as the estimate of revenue from beef. These data are presented in Table A-9 (p. 91) where the value of cattle other than milch cows is multiplied by .2 to obtain the estimated sales. The value figures were calculated by D.B.S. by multiplying the number of cattle and the average price per head. The latter is a weighted average of the different categories of cattle (heifers, steers, calves, etc.).

Statistics are available on the value of milch cows from 1913 (Table A-10, p. 92) and on farm cash receipts from the sale of dairy products from 1920 (Table A-11, p. 93). To estimate the income from dairy products for the years 1913 to 1919, cash receipts from dairy products as a proportion of the value of milch cows was calculated for each province for the years 1920 to 1931 (Table A-12, p. 94). The mean of these proportions was then applied to the value of milch cows for 1913 to 1919 to obtain the estimated revenue from dairy products for those years (Table A-13, p. 95).

Aside from beef and dairy products, data are only available for minor products in the animal and livestock category, such as the value of horses exported. Table A-14 is a comparison of the sum of revenue from dairy products and beef as calculated above with total income from animal products and livestock as reported in Farm Income for 1926 to 1930. The third column shows the former as a proportion of the latter.

Table A-14
Comparison of the Sum of Income from Dairy Products and Beef as Calculated in this Appendix with the Total Income from Animal Products and Livestock as Reported in Farm Income, Prairie Provinces, 1926 to 1930
($'000)

	A Dairy Products and Beef	B All Animal Income	A as % of B
1926	9,710	23,035	42.15
1927	11,176	26,692	41.87
1928	11,758	26,560	44.27
1929	12,721	27,311	46.58
1930	9,998	21,069	47.45
mean			44.46

Sources: Farm Income, pp. 51, 53, 55; Tables A-9 and A-11.

All the values in the third column are within a narrow range bounded by 41.8 and 47.5. And although these figures are hardly a random sample, they do represent more than a quarter of the 18 years in the period 1913 to 1930. It therefore seems reasonable--keeping in mind our earlier remarks about the leeway for error in animal products and livestock estimates, page 63--to estimate income in this category by simply doubling the sum of revenue from dairy products and revenue from beef. To judge from our five year sample, the resulting estimate will, on average, be equal to about 90 per cent of an estimate based on full data, as in Farm Income. The residual 10 per cent or so that is being excluded may be considered an ad hoc correction for inter-farm livestock sales.

The estimates of income from animal products and livestock are presented in Table 2-2, page 38.

Other Agricultural Products

Income-producing farm products not mentioned so far include potatoes, vegetables, grains other than the five major varieties, and forest products. Table A-15 gives the income from these sources in the prairie provinces for 1926 to 1930 as reported in Farm Income. The table also shows the share of these products in total agricultural income. Table A-16 gives the same information from census data, except that 'other field crops' are not included in income from other sources. Except in the Depression year of 1930, income from other products never seems to have amounted to more than two or three per cent of farm income.

Table A-15
Farm Income Estimates of Other Agricultural Income, Prairie Provinces, 1926 to 1930
($'000)

	Other Income	As a % of Total Income
1926	9,381	2.0
1927	9,079	1.8
1928	9,537	1.9
1929	9,135	2.4
1930	7,212	3.2

Source: Farm Income, pp. 50-5.

Table A-16

Value of Other Agricultural Products as Reported in the Census, Prairie Provinces, 1910 to 1930

($'000)

	Other Products	As a % of Total Value
1910	4,608	2.1
1915	6,573	1.1
1920	11,212	1.8
1925	12,243	1.7
1930	12,913	3.8

Sources: Census of Agriculture, 1931, pp. 536-7, 588-9, 660-1; Canada Year Book, 1929, p. 273.

Because income from other sources was clearly such a small proportion of total income, it will simply be ignored in our estimates.

Total Farm Income

The estimates of total farm income are presented in Table A-2, page 38. These are simply the sums of estimates for grains and estimates for animal products and livestock. It has been argued that the estimates are satisfactorily accurate, and that, as a result, even if the animal products and livestock estimates are out by a fairly large margin, the error in the estimates of total income is probably well below 20 per cent.

Table A-2

Aggregate Income of Prairie Farms from the Sale of Grain

1930

	Production ('000 Bu.)	Farm Price ($)	Gross Farm Value ($)	Comm. Prop.	Farm Income ($)
WHEAT					
Man.	45,278	.51	23,091,780		
Sask.	196,322	.42	82,455,240		
Alta.	132,900	.39	51,831,000		
			157,378,020	.7515	118,269,580
OATS					
Man.	50,562	.21	10,618,020		
Sask.	125,509	.15	18,826,350		
Alta.	77,940	.15	11,691,000		
			41,135,370	.2160	8,885,240
BARLEY					
Man.	49,974	.17	8,495,580		
Sask.	40,522	.12	4,862,640		
Alta.	18,999	.14	2,659,860		
			16,018,080	.3128	5,010,455
FLAX					
Man.	1,086	1.05	1,140,300		
Sask.	3,017	.89	2,685,130		
Alta.	190	.95	180,500		
			4,005,930	.8476	3,395,426
RYE					
Man.	2,052	.23	471,960		
Sask.	14,875	.17	2,528,750		
Alta.	3,714	.15	557,100		
			3,557,810	.4212	1,498,550
TOTAL					137,059,251

Source: See last page of table.

Table A-2 (cont'd)

Aggregate Income of Prairie Farms from the Sale of Grain

1929

	Production ('000 Bu.)	Farm Price ($)	Gross Farm Value ($)	Comm. Prop.	Farm Income ($)
WHEAT					
Man.	28,565	1.19	33,992,350		
Sask.	160,565	1.14	183,044,100		
Alta.	92,534	1.14	105,347,580		
			322,384,030	.7676	247,461,980
OATS					
Man.	30,740	.55	16,907,000		
Sask.	68,944	.51	35,161,440		
Alta.	41,936	.49	20,548,640		
			72,617,080	0	
BARLEY					
Man.	36,518	.59	21,545,620		
Sask.	30,755	.53	16,300,150		
Alta.	12,514	.51	6,382,140		
			44,227,910	.2911	12,874,745
FLAX					
Man.	445	2.42	1,076,900		
Sask.	1,462	2.37	3,464,940		
Alta.	63	2.22	139,860		
			4,681,700	.9919	4,643,778
RYE					
Man.	1,309	.86	1,125,740		
Sask.	8,301	.82	6,806,820		
Alta.	2,372	.80	1,897,600		
			9,830,160	.5077	4,990,772
TOTAL					269,971,275

Table A-2 (cont'd)

Aggregate Income of Prairie Farms from the Sale of Grain

1928

	Production ('000 Bu.)	Farm Price ($)	Gross Farm Value ($)	Comm. Prop.	Farm Income ($)
WHEAT					
Man.	52,383	.92	48,192,360		
Sask.	321,215	.77	247,335,550		
Alta.	171,000	.75	128,511,000		
			424,038,910	.8143	345,294,880
OATS					
Man.	53,376	.43	22,951,680		
Sask.	156,043	.38	59,296,340		
Alta.	88,257	.38	33,537,660		
			115,785,680	.1564	18,108,880
BARLEY					
Man.	52,569	.54	28,387,260		
Sask.	44,266	.48	21,247,680		
Alta.	15,849	.47	7,449,030		
			57,083,970	.4340	24,774,443
FLAX					
Man.	804	1.63	1,311,172		
Sask.	2,654	1.56	4,140,240		
Alta.	61	1.50	91,500		
			5,542,912	.9030	5,005,249
RYE					
Man.	2,066	.81	1,673,460		
Sask.	8,412	.74	6,224,880		
Alta.	2,680	.77	2,063,600		
			9,961,940	.6377	6,352,729
TOTAL					399,536,181

Table A-2 (cont'd)

Aggregate Income of Prairie Farms from the Sale of Grain

1927

	Production ('000 Bu.)	Farm Price ($)	Gross Farm Value ($)	Comm. Prop.	Farm Income ($)
WHEAT					
Man.	30,773	1.06	32,619,380		
Sask.	252,500	.97	244,925,290		
Alta.	171,286	.98	167,860,280		
			445,404,950	.8255	367,681,790
OATS					
Man.	25,767	.50	12,883,500		
Sask.	142,526	.44	62,711,440		
Alta.	101,160	.44	44,510,400		
			120,105,340	.1351	16,226,231
BARLEY					
Man.	36,717	.64	23,498,880		
Sask.	27,129	.61	16,548,690		
Alta.	12,000	.58	6,960,000		
			47,007,570	.3217	15,122,335
FLAX					
Man.	1,198	1.59	1,904,820		
Sask.	3,373	1.52	5,126,960		
Alta.	202	1.60	323,200		
			7,354,980	.7382	5,429,446
RYE					
Man.	2,215	.82	1,816,300		
Sask.	7,941	.79	6,273,390		
Alta.	3,131	.78	2,442,180		
			10,531,870	.9516	10,022,127
TOTAL					414,481,930

Table A-2 (cont'd)

Aggregate Income of Prairie Farms from the Sale of Grain

1926

	Production ('000 Bu.)	Farm Price ($)	Gross Farm Value ($)	Comm. Prop.	Farm Income ($)
WHEAT					
Man.	47,133	1.09	51,374,970		
Sask.	219,646	1.08	237,217,680		
Alta.	113,986	1.05	119,685,300		
			408,277,950	.8190	334,379,640
OATS					
Man.	52,778	.43	22,694,540		
Sask.	110,193	.42	46,281,060		
Alta.	57,479	.38	21,842,020		
			90,817,620	.0919	8,346,139
BARLEY					
Man.	50,880	.49	24,931,200		
Sask.	21,891	.45	9,850,950		
Alta.	9,146	.42	3,841,320		
			38,623,470	.4625	17,863,355
FLAX					
Man.	2,051	1.62	3,322,620		
Sask.	3,744	1.60	5,990,400		
Alta.	83	1.50	124,500		
			9,437,520	.8221	7,758,585
RYE					
Man.	3,563	.76	2,707,880		
Sask.	5,454	.74	4,035,960		
Alta.	1,374	.68	934,320		
			7,678,160	.8013	6,152,510
TOTAL					374,500,229

Table A-2 (cont'd)

Aggregate Income of Prairie Farms from the Sale of Grain

1925

	Production ('000 Bu.)	Farm Price ($)	Gross Farm Value ($)	Comm. Prop.	Farm Income ($)
WHEAT					
Man.	39,453	1.18	46,554,540		
Sask.	240,551	1.10	264,606,100		
Alta.	102,955	1.09	112,207,830		
			423,368,470	.8840	374,257,730
OATS					
Man.	71,770	.34	24,401,800		
Sask.	174,967	.33	57,739,110		
Alta.	75,517	.31	23,410,270		
			105,551,180	.1843	19,453,082
BARLEY					
Man.	52,156	.49	25,556,440		
Sask.	27,061	.45	12,177,450		
Alta.	14,924	.43	6,417,320		
			44,151,210	.4271	18,856,982
FLAX					
Man.	1,164	2.10	2,444,400		
Sask.	7,439	1.96	14,580,440		
Alta.	35	1.94	67,900		
			17,092,740	.6728	11,499,995
RYE					
Man.	5,152	.73	3,760,960		
Sask.	4,512	.64	2,887,680		
Alta.	1,881	.62	1,166,220		
			7,814,860	.4353	3,401,809
TOTAL					427,469,598

Table A-2 (cont'd)

Aggregate Income of Prairie Farms from the Sale of Grain

1924

	Production ('000 Bu.)	Farm Price ($)	Gross Farm Value ($)	Comm. Prop.	Farm Income ($)
WHEAT					
Man.	41,464	1.24	51,415,360		
Sask.	132,918	1.21	160,830,780		
Alta.	61,312	1.20	73,574,400		
			285,820,540	.7840	224,083,300
OATS					
Man.	70,729	.47	33,242,630		
Sask.	97,345	.43	41,858,350		
Alta.	55,251	.41	22,652,910		
			97,753,890	.1298	12,688,455
BARLEY					
Man.	40,923	.70	28,646,100		
Sask.	17,360	.63	10,936,800		
Alta.	12,347	.59	7,284,730		
			46,867,630	.4201	19,689,091
FLAX					
Man.	3,403	1.94	6,601,820		
Sask.	6,119	1.95	11,932,050		
Alta.	56	1.90	106,210		
			18,640,080	.8559	15,954,044
RYE					
Man.	5,875	1.00	5,875,000		
Sask.	2,507	.95	2,381,650		
Alta.	2,744	.97	2,661,680		
			10,918,330	.4586	5,007,146
TOTAL					277,422,036

Table A-2 (cont'd)

Aggregate Income of Prairie Farms from the Sale of Grain

1923

	Production ('000 Bu.)	Farm Price ($)	Gross Farm Value ($)	Comm. Prop.	Farm Income ($)
WHEAT					
Man.	35,804	.67	23,988,680		
Sask.	271,622	.65	176,554,300		
Alta.	144,834	.65	94,142,100		
			294,685,080	.8246	242,997,320
OATS					
Man.	58,704	.30	17,611,200		
Sask.	218,075	.25	54,518,750		
Alta.	114,977	.24	27,594,480		
			99,724,430	.2324	23,175,958
BARLEY					
Man.	25,726	.37	9,518,620		
Sask.	19,278	.35	6,747,370		
Alta.	14,774	.33	4,875,420		
			21,141,410	.2823	5,968,220
FLAX					
Man.	1,395	1.89	2,636,550		
Sask.	5,494	1.75	9,614,150		
Alta.	156	1.63	254,280		
			12,504,980	.6495	8,121,984
RYE					
Man.	4,620	.52	2,402,400		
Sask.	8,582	.45	3,861,900		
Alta.	7,640	.40	3,056,000		
			9,320,300	.3599	3,354,376
TOTAL					283,617,858

Table A-2 (cont'd)

Aggregate Income of Prairie Farms from the Sale of Grain

1922

	Production ('000 Bu.)	Farm Price ($)	Gross Farm Value ($)	Comm. Prop.	Farm Income ($)
WHEAT					
Man.	60,051	.83	49,842,330		
Sask.	250,167	.85	212,641,950		
Alta.	64,976	.77	50,031,520		
			312,515,800	.7645	238,918,330
OATS					
Man.	74,433	.31	23,074,230		
Sask.	179,708	.29	52,115,320		
Alta.	35,519	.35	12,431,650		
			87,621,200	.1361	11,925,245
BARLEY					
Man.	28,863	.41	11,833,830		
Sask.	18,511	.38	7,034,180		
Alta.	6,238	.42	2,619,960		
			21,487,970	.3229	6,938,465
FLAX					
Man.	734	1.80	1,321,200		
Sask.	4,079	1.71	6,975,090		
Alta.	89	1.52	134,824		
			8,431,114	.7628	6,431,254
RYE					
Man.	7,078	.61	4,317,580		
Sask.	16,164	.63	10,183,320		
Alta.	6,187	.55	3,402,850		
			17,903,750	.3959	7,088,095
TOTAL					271,301,389

Table A-2 (cont'd)

Aggregate Income of Prairie Farms from the Sale of Grain

1921

	Production ('000 Bu.)	Farm Price ($)	Gross Farm Value ($)	Comm. Prop.	Farm Income ($)
WHEAT					
Man.	89,054	.91	81,039,140		
Sask.	188,000	.76	142,880,000		
Alta.	53,044	.77	40,755,800		
			264,674,940	.7964	210,787,120
OATS					
Man.	49,443	.30	14,832,750		
Sask.	170,513	.24	40,923,120		
Alta.	64,192	.24	15,406,080		
			71,161,950	.1334	9,493,004
BARLEY					
Man.	19,682	.43	8,463,088		
Sask.	13,343	.36	4,803,480		
Alta.	11,657	.32	3,730,240		
			16,996,808	.2778	4,721,713
FLAX					
Man.	545	1.50	817,050		
Sask.	3,230	1.38	4,457,400		
Alta.	171	1.28	218,880		
			5,493,330	.6855	3,765,677
RYE					
Man.	3,565	.79	2,816,113		
Sask.	13,546	.67	9,075,820		
Alta.	1,999	.62	1,239,380		
			13,131,313	.2939	3,859,293
TOTAL					232,626,810

Table A-2 (cont'd)

Aggregate Income of Prairie Farms from the Sale of Grain

1920

	Production ('000 Bu.)	Farm Price ($)	Gross Farm Value ($)	Comm. Prop.	Farm Income ($)
WHEAT					
Man.	37,542	1.83	68,701,860		
Sask.	113,135	1.55	175,359,720		
Alta.	83,461	1.52	126,860,720		
			370,922,300	.8015	297,294,220
OATS					
Man.	57,657	.56	32,287,920		
Sask.	141,549	.41	58,035,090		
Alta.	115,091	.36	41,432,760		
			131,755,770	.2307	30,396,056
BARLEY					
Man.	17,520	.80	14,016,000		
Sask.	10,502	.66	6,930,990		
Alta.	12,739	.62	7,898,180		
			28,845,170	.2997	8,644,897
FLAX					
Man.	1,158	2.25	2,605,185		
Sask.	5,705	1.82	10,383,100		
Alta.	726	1.83	1,328,580		
			14,316,865	.6630	9,492,081
RYE					
Man.	2,319	1.35	3,130,110		
Sask.	2,535	1.26	3,194,100		
Alta.	3,420	1.25	4,275,000		
			10,599,210	.3652	3,870,831
TOTAL					349,698,086

Table A-2 (cont'd)

Aggregate Income of Prairie Farms from the Sale of Grain

1919

	Production ('000 Bu.)	Farm Price ($)	Gross Farm Value ($)	Comm. Prop.	Farm Income ($)
WHEAT					
Man.	40,975	2.40	98,340,000		
Sask.	89,994	2.32	208,786,080		
Alta.	34,575	2.31	79,868,250		
			386,994,330	.8172	316,251,770
OATS					
Man.	57,698	.72	41,542,560		
Sask.	112,157	.70	78,509,900		
Alta.	65,725	.64	42,064,000		
			162,116,460	.1902	30,834,551
BARLEY					
Man.	17,149	1.17	20,064,330		
Sask.	8,971	1.08	9,688,680		
Alta.	10,562	1.09	11,512,580		
			41,265,590	.2448	10,101,816
FLAX					
Man.	520	4.26	2,215,200		
Sask.	4,490	4.14	18,588,600		
Alta.	222	4.15	921,300		
			21,725,100	.6734*	14,629,682
RYE					
Man.	4,089	1.28	5,233,920		
Sask.	2,000	1.31	2,620,000		
Alta.	1,173	1.42	1,665,660		
			9,519,580	.3454*	3,287,825
TOTAL					375,105,640

*Not available. Figure given is average of 1917, '18, '20, '21.

Table A-2 (cont'd)

Aggregate Income of Prairie Farms from the Sale of Grain

1918

	Production ('000 Bu.)	Farm Price ($)	Gross Farm Value ($)	Comm. Prop.	Farm Income ($)
WHEAT					
Man.	48,191	2.06	99,273,460		
Sask.	92,493	1.99	184,061,070		
Alta.	23,752	1.92	45,603,840		
			328,938,370	.7790	256,242,990
OATS					
Man.	54,474	.71	38,676,540		
Sask.	107,253	.70	75,077,100		
Alta.	60,323	.73	44,035,790		
			157,789,430	.0719	11,345,060
BARLEY					
Man.	27,963	.89	24,887,070		
Sask.	11,888	.88	10,461,440		
Alta.	7,756	.97	7,523,320		
			42,871,830	.2406	10,314,962
FLAX					
Man.	1,091	3.15	3,436,650		
Sask.	4,205	3.10	13,035,500		
Alta.	480	3.12	1,497,600		
			17,969,750	.3932	7,065,706
RYE					
Man.	3,936	1.41	5,549,760		
Sask.	1,420	1.50	2,130,000		
Alta.	826	1.41	1,164,660		
			8,844,420	.2142	1,894,475
TOTAL					286,863,190

Table A-2 (cont'd)

Aggregate Income of Prairie Farms from the Sale of Grain

1917

	Production ('000 Bu.)	Farm Price ($)	Gross Farm Value ($)	Comm. Prop.	Farm Income ($)
WHEAT					
Man.	41,040	2.05	84,132,000		
Sask.	117,921	1.95	229,945,950		
Alta.	52,992	1.74	92,206,080		
			406,284,030	.7731	314,098,180
OATS					
Man.	45,375	.67	30,401,250		
Sask.	123,214	.62	76,392,680		
Alta.	86,289	.63	54,362,070		
			161,156,000	.1130	18,210,628
BARLEY					
Man.	15,930	1.07	17,045,100		
Sask.	14,068	1.00	14,068,000		
Alta.	10,386	.98	10,178,280		
			41,291,380	.1967	8,122,014
FLAX					
Man.	147	2.85	418,950		
Sask.	4,711	2.60	12,248,600		
Alta.	979	2.78	2,721,620		
			15,389,170	.8521	13,113,112
RYE					
Man.	638	1.62	1,033,560		
Sask.	998	1.63	1,626,740		
Alta.	633	1.50	949,500		
			3,609,800	.4775	1,723,679
TOTAL					355,267,610

Table A-2 (cont'd)

Aggregate Income of Prairie Farms from the Sale of Grain

1916

	Production ('000 Bu.)	Farm Price ($)	Gross Farm Value ($)	Comm.* Prop.	Farm Income ($)
WHEAT					
Man.	29,667	1.23	36,490,410		
Sask.	147,559	1.28	188,875,520		
Alta.	65,088	1.33	86,567,040		
			311,932,970	.8002	249,608,760
OATS					
Man.	48,439	.49	23,735,110		
Sask.	163,278	.46	75,107,880		
Alta.	102,199	.46	47,011,540		
			145,854,530	.1444	21,061,394
BARLEY					
Man.	13,729	.80	10,983,200		
Sask.	9,916	.77	7,635,320		
Alta.	9,774	.71	6,939,540		
			25,558,060	.3239	8,278,256
FLAX					
Man.	210	2.13	447,300		
Sask.	6,692	2.23	14,923,160		
Alta.	1,310	1.06**	1,388,600		
			16,759,060	.7567	12,681,581
RYE					
Man.	557	1.06	590,420		
Sask.	548	1.10	602,800		
Alta.	440	.95	418,000		
			1,611,220	.4862	783,375
TOTAL					292,413,366

*Not available. The figures given are averages of the figures for 1917 to 1930.

**It would seem that this is a mistake, and that the proper figure should be 2.06. However, using this higher value would increase the estimate of Total Farm Income by only 0.33 per cent.

Table A-2 (cont'd)

Aggregate Income of Prairie Farms from the Sale of Grain

1915

	Production ('000 Bu.)	Farm Price ($)	Gross Farm Value ($)	Comm.* Prop.	Farm Income ($)
WHEAT					
Man.	69,337	.90	62,403,300		
Sask.	224,312	.91	204,123,920		
Alta.	66,538	.88	58,553,440		
			325,080,660	.8002	260,129,540
OATS					
Man.	50,750	.35	17,762,500		
Sask.	145,066	.32	46,421,120		
Alta.	83,876	.30	25,162,800		
			89,346,420	.1444	12,901,623
BARLEY					
Man.	16,658	.51	8,495,580		
Sask.	9,523	.46	4,380,580		
Alta.	9,822	.44	4,321,680		
			17,197,840	.3239	5,570,380
FLAX					
Man.	120	1.61	193,200		
Sask.	5,255	1.51	7,935,050		
Alta.	670	1.44	964,800		
			9,093,050	.7567	6,880,711
RYE					
Man.	208	.80	166,400		
Sask.	203	.64	129,920		
Alta.	375	.62	232,500		
			528,820	.4862	257,112
TOTAL					285,739,366

*Not available. The figures given are averages of the figures for 1917 to 1930.

Table A-2 (cont'd)

Aggregate Income of Prairie Farms from the Sale of Grain

1914

	Production ('000 Bu.)	Farm Price ($)	Gross Farm Value ($)	Comm.* Prop.	Farm Income ($)
WHEAT					
Man.	38,605	1.01	38,991,050		
Sask.	73,494	.96	70,554,240		
Alta.	28,859	.91	26,261,690		
			135,806,980	.8002	108,672,750
OATS					
Man.	31,951	.48	15,336,480		
Sask.	61,816	.45	27,817,200		
Alta.	57,076	.42	23,971,920		
			67,125,600	.1444	9,692,937
BARLEY					
Man.	9,828	.55	5,405,400		
Sask.	4,901	.50	2,450,500		
Alta.	4,806	.51	2,451,060		
			10,306,960	.3239	3,338,424
FLAX					
Man.	338	1.10	371,800		
Sask.	6,131	1.01	6,192,310		
Alta.	614	1.05	644,700		
			7,208,810	.7567	5,454,907
RYE					
Man.	100	.90	90,000		
Sask.	54	.67	36,180		
Alta.	361	.66	238,260		
			364,440	.4862	177,191
TOTAL					127,336,209

*Not available. The figures given are averages of the figures for 1917 to 1930.

Table A-2 (cont'd)

Aggregate Income of Prairie Farms from the Sale of Grain

1913

	Production ('000 Bu.)	Farm Price ($)	Gross Farm Value ($)	Comm.* Prop.	Farm Income ($)
WHEAT					
Man.	53,331	.71	37,865,010		
Sask.	121,559	.64	77,797,760		
Alta.	34,372	.61	20,966,920		
			136,629,690	.8002	109,331,080
OATS					
Man.	56,759	.28	15,892,520		
Sask.	114,112	.25	28,528,000		
Alta.	71,542	.24	17,170,080		
			61,590,600	.1444	8,893,683
BARLEY					
Man.	14,305	.34	4,863,700		
Sask.	10,421	.30	3,126,300		
Alta.	6,334	.31	1,963,540		
			9,953,540	.3239	3,223,952
FLAX					
Man.	632	1.05	663,600		
Sask.	15,579	.95	14,800,050		
Alta.	1,155	1.19	1,374,450		
			16,838,100	.7567	12,741,390
RYE					
Man.	103	.58	59,740		
Sask.	68	.40	27,200		
Alta.	398	.46	183,080		
			270,020	.4862	131,284
TOTAL					134,321,389

*Not available. The figures given are averages of the figures for 1917 to 1930.

Table A-2 (cont'd)

Aggregate Income of Prairie Farms from the Sale of Grain

1912

	Production ('000 Bu.)	Farm Price ($)	Gross Farm Value ($)	Comm.* Prop.	Farm Income ($)
WHEAT					
Man.	63,017	.67	42,221,390		
Sask.	106,960	.56	59,897,600		
Alta.	34,303	.54	18,523,620		
			120,642,610	.8002	96,538,217
OATS					
Man.	57,154	.28	16,003,120		
Sask.	117,537	.23	27,033,510		
Alta.	67,630	.24	16,231,200		
			59,267,830	.1444	8,558,275
BARLEY					
Man.	15,826	.37	5,855,620		
Sask.	9,595	.33	3,166,350		
Alta.	6,179	.33	2,039,070		
			11,061,040	.3239	3,582,671
FLAX					
Man.	1,252	1.04	1,302,080		
Sask.	23,033	.89	20,499,370		
Alta.	1,693	.92	1,557,560		
			23,359,010	.7567	17,675,763
RYE					
Man.	105	.58	60,900		
Sask.	57	.56	31,920		
Alta.	377	.56	211,120		
			303,940	.4862	147,776
TOTAL					126,502,702

*Not available. The figures given are averages of the figures for 1917 to 1930.

Table A-2 (cont'd)

Aggregate Income of Prairie Farms from the Sale of Grain

1911

	Production ('000 Bu.)	Farm Price ($)	Gross Farm Value ($)	Comm.* Prop.	Farm Income ($)
WHEAT					
Man.	62,820	.67	42,089,400		
Sask.	109,323	.58	63,407,340		
Alta.	36,554	.62	22,663,480		
			128,160,220	.8002	102,553,810
OATS					
Man.	60,011	.32	19,203,520		
Sask.	107,542	.29	31,187,180		
Alta.	58,985	.28	16,515,800		
			66,906,500	.1444	9,661,299
BARLEY					
Man.	14,967	.48	7,184,160		
Sask.	8,658	.47	4,069,260		
Alta.	4,349	.41	1,783,090		
			13,036,510	.3239	4,222,526
FLAX					
Man.	1,149	1.76	2,022,240		
Sask.	13,039	1.50	19,558,500		
Alta.	1,116	1.20	1,339,200		
			22,919,940	.7567	17,343,519
RYE					
Man.	104	.70	72,800		
Sask.	61	.53	32,330		
Alta.	394	.61	240,340		
			345,470	.4862	167,968
TOTAL					133,949,122

*Not available. The figures given are averages of the figures for 1917 to 1930.

Table A-2 (cont'd)

Aggregate Income of Prairie Farms from the Sale of Grain

1910

	Production ('000 Bu.)	Farm Price ($)	Gross Farm Value ($)	Comm. Prop.	Farm Income ($)
WHEAT					
Man.	34,127	.84	28,666,680		
Sask.	66,979	.75	50,234,250		
Alta.	9,060	.74	6,704,400		
			85,605,330	.8002	68,501,385
OATS					
Man.	30,347	.33	10,014,510		
Sask.	58,923	.30	17,676,900		
Alta.	16,894	.34	5,743,960		
			33,435,370	.1444	4,828,067
BARLEY					
Man.	6,517	.45	2,932,650		
Sask.	3,061	.42	1,285,620		
Alta.	2,480	.43	1,066,400		
			5,284,670	.3239	1,711,705
FLAX					
Man.	177	2.19	387,630		
Sask.	3,893	2.10	8,175,300		
Alta.	78	2.07	161,460		
			8,724,390	.7567	6,601,746
RYE					
Man.	29	.70	20,300		
Sask.	12	.53	6,360		
Alta.	109	.55	59,950		
			86,610	.4862	42,110
TOTAL					81,685,013

*Not available. The figures given are averages of the figures for 1917 to 1930.

Table A-2 (cont'd)

Aggregate Income of Prairie Farms from the Sale of Grain

1909

	Production ('000 Bu.)	Farm Price ($)	Gross Farm Value ($)	Comm.* Prop.	Farm Income ($)
WHEAT					
Man.	52,706	.87	45,854,220		
Sask.	85,197	.81	69,009,570		
Alta.	9,579	.73	6,992,670		
			121,856,460	.8002	97,509,539
OATS					
Man.	55,267	.31	17,132,770		
Sask.	91,796	.25	22,949,000		
Alta.	38,376	.24	9,210,240		
			49,292,010	.1444	7,117,766
BARLEY					
Man.	20,866	.38	7,929,080		
Sask.	4,493	.36	1,617,480		
Alta.	3,599	.34	1,223,660		
			10,770,220	.3239	3,488,474
FLAX					
Man.	317	1.32	418,440		
Sask.	1,787	1.25	2,233,750		
Alta.	109	1.05	114,450		
			2,766,640	.7567	2,093,517
RYE					
Man.	75	.61	45,750		
Sask.	38	1.09	41,420		
Alta.	152	.53	80,560		
			167,730	.4862	81,550
TOTAL					110,290,846

*Not available. The figures given are averages of the figures for 1917 to 1930.

Table A-2 (cont'd)

Aggregate Income of Prairie Farms from the Sale of Grain

1908

	Production ('000 Bu.)	Farm Price ($)	Gross Farm Value ($)	Comm. Prop.	Farm Income ($)
WHEAT					
Man.	50,269	.83	41,723,270		
Sask.	34,742	.75	26,056,500		
Alta.	6,842	.67	4,584,140		
			72,363,910	.8002	57,905,601
OATS					
Man.	44,711	.32	14,307,520		
Sask.	29,205	.29	8,469,450		
Alta.	22,802	.28	6,384,560		
			29,161,530	.1444	4,210,925
BARLEY					
Man.	17,093	.39	6,666,270		
Sask.	1,952	.39	761,280		
Alta.	3,881	.33	1,280,730		
			8,708,280	.3239	2,820,612
FLAX					
Man.	281	.97	272,570		
Sask.	1,144	.99	1,132,560		
Alta.	74	.75	55,500		
			1,460,630	.7567	1,105,259
RYE					
Man.	101	.60	60,600		
Sask.	41	.58	23,780		
Alta.	200	.58	116,000		
			200,380	.4862	97,425
TOTAL					66,139,822

*Not available. The figures given are averages of the figures for 1917 to 1930.

Sources: Report on the Grain Trade of Canada, various years; Handbook of Agricultural Statistics, Part I: Field Crops, 1908-1958.

Table A-9

Estimated Sales of Beef, Prairie Provinces, 1913 to 1930

($'000)

	Value of Cattle	Estimated Sales
1913	46,912	9,382
1914	73,605	14,721
1915	83,157	16,631
1916	156,969	31,394
1917	191,794	38,359
1918	236,217	47,243
1919	218,364	43,673
1920	137,274	27,455
1921	105,761	21,152
1922	86,116	17,223
1923	80,166	16,033
1924	91,212	18,242
1925	98,842	19,768
1926	84,490	16,898
1927	122,581	24,516
1928	131,907	26,381
1929	135,108	27,022
1930	101,006	20,201

Note: Estimated Sales = .2 times Value of Cattle

Sources: Canada Year Book, 1913, Ibid., 1914; Monthly Bulletin of Agricultural Statistics (Feb., 1922); Ibid. (Feb., 1926); Ibid. (Feb., 1929); Ibid. (Feb., 1932).

Table A-10

Value of Milch Cows, Prairie Provinces, 1913 to 1930

($'000)

	Manitoba	Saskatchewan	Alberta
1913	6,150	8,427	7,260
1914	9,675	13,472	11,887
1915	10,237	14,606	12,602
1916	14,427	23,358	21,354
1917	17,842	30,213	29,083
1918	20,622	32,122	30,569
1919	20,609	34,040	29,957
1920	15,698	25,879	21,698
1921	11,378	20,577	20,312
1922	10,589	18,405	14,724
1923	10,170	15,645	15,808
1924	10,248	19,194	16,332
1925	10,229	20,357	18,318
1926	11,311	17,968	17,446
1927	14,802	23,576	20,966
1928	17,433	27,203	23,427
1929	15,325	27,300	25,598
1930	13,502	24,882	20,334

Sources: Same as Table A-9.

Table A-11
Farm Cash Receipts from Dairy Products, Prairie Provinces, 1920 to 1931
($'000)

	Man.	Sask.	Alta.	Total
1920	6,483	6,701	8,278	21,462
1921	5,109	5,107	6,164	16,380
1922	4,792	4,879	6,161	15,832
1923	4,953	5,549	6,985	17,487
1924	5,476	6,099	7,966	19,541
1925	6,087	7,770	8,423	22,280
1926	6,421	7,528	8,097	22,046
1927	6,416	6,694	7,357	20,467
1928	6,400	6,885	7,155	20,440
1929	7,108	7,918	7,664	22,690
1930	5,707	6,681	6,832	19,220
1931	6,088	6,735	6,930	19,753

Source: Statistics Canada, Handbook of Agricultural Statistics: Part VII, Dairy Statistics, 1920-1973. Catalogue number 21-515.

Table A-12

Farm Cash Receipts from Dairy Products as a Proportion of the Value of Milch Cows, Prairie Provinces, 1920 to 1931

	Man.	Sask.	Alta.
1920	.413	.259	.382
1921	.449	.248	.303
1922	.453	.265	.418
1923	.487	.355	.442
1924	.534	.318	.488
1925	.595	.382	.460
1926	.568	.419	.464
1927	.433	.284	.351
1928	.367	.253	.305
1929	.464	.290	.299
1930	.423	.269	.336
1931	.554	.362	.369
mean	.478	.309	.385
s	.070	.057	.068

Note: s = standard deviation.

Source: Tables A-10 and A-11.

Table A-13

Estimated Receipts from Dairy Products, Prairie Provinces, 1913 to 1919
($'000)

	Manitoba	Saskatchewan	Alberta	Total
1913	2,940	2,604	2,795	8,339
1914	4,625	4,163	4,576	13,364
1915	4,893	4,513	4,852	14,258
1916	6,896	7,218	8,221	22,335
1917	8,528	9,336	11,197	29,061
1918	9,857	9,926	11,769	31,552
1919	9,851	10,518	11,533	31,902

Note: The above values were obtained by multiplying the value of milch cows in each province, as given in Table A-10, by a coefficient derived in Table A-12, namely: .478 (Manitoba), .309 (Saskatchewan) and .385 (Alberta).

Sources: Tables A-10, A-11 and A-12.

Bibliography

Baldwin, Robert E. "Patterns of Development in Newly Settled Regions." The Manchester School 24 (May, 1956), 161-79.

Bertram, Gordon W. "Economic Growth in Canadian Industry, 1870-1915: The Staple Model." Approaches to Canadian Economic History, ed. W.T. Easterbrook and M.H. Watkins. Toronto: McClelland and Stewart, 1967.

_____. "The Relevance of the Wheat Boom in Canadian Economic Growth." Canadian Journal of Economics 6 (November, 1973), 545-66.

Britnell, G.E. The Wheat Economy. Toronto: University of Toronto Press, 1939.

Brown, Vere. "Rural Banking Credits: The Functions and Obligations of the Chartered Banks." Reprinted from the Grain Growers Guide, n.d.

Buckley, Kenneth. Capital Formation in Canada, 1896-1930. Toronto: McClelland and Stewart, 1974.

_____. "The Role of Staple Industries in Canada's Economic Development." Journal of Economic History 17 (1958), 439-50.

Burley, Kevin H. The Development of Canada's Staples, 1867-1939: A Documentary Collection. Toronto: McClelland and Stewart, n.d.

Burton, G.L. "The Farmer and the Market." Canadian Journal of Economics and Political Science 15 (1949), 495-504.

Canada. Census and Statistics Office and Dominion Bureau of Statistics. Canada Year Book. Ottawa: The King's Printer, various years.

_____. Census of Canada. Ottawa: The King's Printer, various years.

_____. Census of Population and Agriculture in the Northwest Provinces, 1906, in Canada. Third Session of the Tenth Parliament. Sessional Papers, 1906-7 Vol. 6.

_____. Census of Prairie Provinces, 1916: Population and Agriculture. Ottawa: The King's Printer, 1918.

_____. Dominion Bureau of Statistics. Cost of Grain Production in Canada, 1923. Ottawa: The King's Printer, 1924.

_____. Dominion Bureau of Statistics. Handbook of Agricultural Statistics, Part I: Field Crops, 1908-1958, rev. ed. Ottawa: 1959.

_____. Dominion Bureau of Statistics. Handbook of Agricultural Statistics, Part II: Farm Income, 1926-1957, rev. ed. Ottawa: 1958.

Canada. Statistics Canada. Handbook of Agricultural Statistics: Part VII: Dairy Statistics, 1920-1973. Ottawa: 1974.

_____. Dominion Bureau of Statistics. The Manufacturing Industries of Canada, 1930. Ottawa: The King's Printer, 1931.

_____. Dominion Bureau of Statistics. Monthly Bulletin of Agricultural Statistics, various years.

_____. Dominion Bureau of Statistics. Agriculture Division. Outline of the Methods, Sources and Concepts used in Estimating Farm Income of Farm Operators from Farm Operations as prepared by the Dominion Bureau of Statistics. Ottawa: 1963.

_____. Dominion Bureau of Statistics. Report on the Grain Trade of Canada. Ottawa: The King's Printer, various issues.

Canadian Review of Sociology and Anthropolgy 17 (August, 1980), "Special Issue on Dependency, Underdevelopment and Regionalism."

Caves, R.E. "Export-Led Growth and the New Economic History." Trade, Balance of Payments and Growth, ed. J.N. Bhagwati, R.W. Jones, R.A. Mundell and J. Vanek. Amsterdam: North-Holland, 1971.

Chambers, E.J. and D.F. Gordon. "Primary Products and Economic Growth: An Empirical Measurement." Journal of Political Economy 74 (August, 1966), 315-32.

Clark, Melissa. The Canadian State and Staples: Ph.D. Thesis, McMaster University, 1979. Forthcoming, University of Toronto Press.

Dales, J.H., J.C. McManus and M.H. Watkins. "Primary Products and Economic Growth: A Comment." Journal of Political Economy 75 (December, 1967), 876-80.

Davenport, Paul. "The Sources of Economic Growth in Twentieth Century Canada." Paper presented to the Seventh Conference on Quantitative Methods in Canadian Economic History, Guelph, February, 1975.

Dawson, C.A. and E.R. Younge. Pioneering in the Prairie Provinces: The Social Side of the Settlement Process. Toronto: Macmillan, 1940.

Dawson, C.A. The Settlement of the Peace River Country. Toronto: Macmillan, 1934.

Easterbrook, W.T. and H.G.J. Aitken. Canadian Economic History. Toronto: Macmillan, 1956.

Easterlin, R.A. "Interregional Differences in Per Capita Income, Population, and Total Income, 1840-1950." Trends in the American Economy in the Nineteenth Century, ed. National Bureau of Economic Research. Princeton: Princeton University Press, 1960.

Easterlin, R.A. "State Income Estimates." Population Redistribution and Economic Growth, United States, 1870-1950: I Methodological Considerations and Reference Tables, ed. S. Kuznets and D.S Thomas. Philadelphia: American Philosophical Society, 1957.

Fowke, V.C. Canadian Agricultural Policy. Toronto: University of Toronto Press, 1946.

_____. "The National Policy--Old and New." Canadian Journal of Economics and Political Science 18 (August, 1952).

_____. "National Policy and Western Development in North America." Journal of Economic History 16 (December, 1956), 461-81.

_____. The National Policy and the Wheat Economy. Toronto: University of Toronto Press, 1957.

Frank, A.G. Capitalism and Underdevelopment in Latin America. New York: Monthly Review Press, 1969.

Fulmer, J.L. "Measurement of Agricultural Income of Counties." Regional Income, ed. National Bureau of Economic Research. Princeton: Princeton University Press.

Innis, H.A. Essays in Canadian Economic History. Toronto: University of Toronto Press, 1956.

_____. The Fur Trade in Canada. Toronto: University of Toronto Press, 1970.

_____. Problems of Staple Production in Canada. Toronto: Ryerson, 1933.

MacGibbon. The Canadian Grain Trade. Toronto: Macmillan, 1932.

Mackintosh, W.A. Agricultural Co-operation in Western Canada. Toronto: Ryerson, 1924.

_____. The Economic Background of Dominion-Provincial Relations. Toronto: McClelland and Stewart, 1964.

_____. "Economic Factors in Canadian History." Approaches to Canadian Economic History, ed. Easterbrook and Watkins. Toronto: McClelland and Stewart, 1967.

_____. Economic Problems of the Prairie Provinces. Toronto: Macmillan, 1935.

_____. Prairie Settlement: The Geographical Setting. Toronto: Macmillan, 1934.

Martin, Chester. "Dominion Lands" Policy. Toronto: Macmillan, 1938.

_____. The Natural Resources Question: The Historical Basis of Provincial Claims. Winnipeg: The King's Printer for the Province of Manitoba, 1920.

Munyon, Paul Glen. "A Critical Review of Estimates of Net Income from Agriculture for 1880 and 1900: New Hampshire, A Case Study." Journal of Economic History 38 (September, 1977), 634-54.

Murchie, R.W. Agricultural Progress on the Prairie Frontier. Toronto: Macmillan, 1936.

Naylor, Tom. "The Canadian State, the Accumulation of Capital, and the Great War." Unpublished manuscript, McGill University, May, 1978.

_____. The History of Canadian Business: 1867-1914. Toronto: James Lorimer, 1975.

Norrie, K.H. "Agricultural Implement Tariffs, the National Policy, and Income Distribution in the Wheat Economy." Canadian Journal of Economics 7 (November, 1974), 449-62.

Urquhart, M.C. and K.A.H. Buckley, eds. Historical Statistics of Canada. Cambridge and Toronto: Cambridge University Press and Macmillan Co. of Canada, 1965.

Vickery, Edward. "Exports and North American Economic Growth: 'Structuralist' and 'Staple' Models in Historical Perspective." Canadian Journal of Economics 7 (February, 1974), 32-58.

Watkins, M.H. "A Staple Theory of Economic Growth." Approaches to Canadian Economic History, ed. Easterbrook and Watkin. Toronto: McClelland and Stewart, 1967.

_____. "The Staple Theory Revisited." Journal of Canadian Studies 12 (Winter, 1977), 83-95.

Wheeler, Seager. Seager Wheeler's Book on Profitable Grain Growing. Winnipeg: Grain Growers Guide, 1919.