

## Chapter 10

### RETAIL AND WHOLESALE DISTRIBUTION

Retail and wholesale distribution costs make up a significant part of the total price of farm machinery. Estimates by the Commission indicate that currently in Canada the farm machinery dealer receives about 13 per cent of the price paid by the farmer for new machines. An additional 14 per cent covers the cost of wholesale distribution. The remainder can be traced to the cost of manufacture, including the manufacturer's profit, the cost of research and development, and various head-office costs, some of which are related to distribution. This breakdown of the total sales value of farm machinery is based on a comparison of the prices of new machines at different transaction levels as shown in Table 10.1. Let us consider retail and wholesale distribution in turn.

TABLE 10.1—PRICE LEVELS IN THE CANADIAN FARM MACHINERY INDUSTRY

	Percentage of Suggested Retail Price
Suggested retail price (SRP)	100
Price paid by farmer, after cash discount or overallowance on trade-in	84
Net wholesale price (NWP) or net selling price to dealer including volume discounts	73
Typical transfer price between manufacturer and selling division	61
Typical North American manufacturing cost level <sup>1</sup>	54

<sup>1</sup> Based on 11-year average of two major farm machinery manufacturers: Deere & Company (51 per cent) and J. I. Case Company (57 per cent).

Source: N. B. MacDonald, W. F. Barnicke, F. W. Judge, K. E. Hansen, *Farm Tractor Production Costs*, Royal Commission on Farm Machinery, Study No. 2 (Ottawa: Queen's Printer, 1969), Figure 1.

#### Retail Distribution

During the past 25 years there has been a fundamental change in the way in which farm machinery has been handled at the retail level in Canada. Until the early 1940s most machinery was sold through agents. In 1931, for example, the Canadian

Census of Merchandising and Service Establishments<sup>1</sup> reported 475 dealers and 5,078 agents in the farm implement category. Of this total, 4,518 had annual sales of less than \$5,000 (for 1930). For the most part these agents had little responsibility beyond selling. In the words of one farm machinery executive, many of them were little more than "bird-dogs" who helped locate sales prospects. There were agents in almost every village. The farm machinery companies undertook, through their branch offices, the major responsibility of stocking new machines for delivery to farmers, stocking and supplying repair parts, and collecting amounts due on past sales. In 1935 the Massey-Harris Company alone had almost 2,300 agents and 15 branch offices.

In the late thirties the industry changed from an agency basis of operation to selling its products through independent franchised dealers. Massey-Harris (now Massey-Ferguson) made the change in 1944, and moved from 1,957 agents in 1944 to 1,350 dealers in 1950. Unlike the agent, the dealer was an independent businessman who purchased new machines and parts from the company and sold them to his farmer customers. In addition, he was responsible for keeping an adequate stock of parts, providing repair and maintenance services, and implementing the company's warranty programs. In effect, he absorbed many of the functions formerly performed by the companies themselves.

This change from an agency to a dealership basis of operation undoubtedly was induced by the unsatisfactory nature of the agency system, as machines became more complex, and as prompt and reliable repair parts service became more critical. An alternative might have been a system of company-operated stores comparable to the depots now maintained by C.C.I.L. In fact, almost all the companies have a few stores, usually in locations where they have been unable to establish a satisfactory dealer. But the companies uniformly report that the independent dealer provides a more satisfactory basis of operation, both in terms of lower costs and better service. The dealer's income is directly dependent on the efficiency with which he operates and the service he provides. Thus he has more incentive than a salaried manager of a company-owned store. Further, the profitability of dealer operations is often critically dependent on the skill with which trade-ins are evaluated and disposed of. With his entire income at stake, the independent dealer is likely to do a better job in this area than a salaried store manager, who may receive a bonus for a good sales record but would not share in losses.

However, the dealership system still retains many of the elements of the old agency system. The companies provide their dealers with many support facilities and supervise their operations very closely. The dealers are given advice on how to plan and construct their premises, what parts to stock, and how to manage their

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<sup>1</sup> Dominion Bureau of Statistics Special Machine Runs of Census of Merchandising and Service Establishments, 1961

business. Training courses are offered for their employees. Product information manuals are provided which give data on the capabilities of various machines and instruct dealers on how to display and demonstrate them. Selling aids provide dealers with comparative data on competitive brands of various machines. Formal sales-training courses and seminars are provided. Service manuals are made available. And within a decade after the end of the Second World War most of the companies began to finance new machines in the hands of dealers under floor-planning arrangements. These arrangements were later extended to second-hand machinery. More recently, many of the companies also introduced retail finance plans.

Supervision of the dealers is carried out by blockmen (district managers, territory managers, etc.) who are responsible for from 10 to 15 dealers whom they visit on a regular basis. The blockman inspects the dealers' premises, keeps a record of sales at the retail level, ensures that the company is paid when sales take place, considers the status and performance of the various dealer departments, takes wholesale orders, reviews the follow-up on collections, and counsels dealers on the many phases of their business. Blockmen are also responsible for recruitment of new dealers in their territory and for dealer development—the upgrading of dealers by introducing new methods and programs. They also participate in local field demonstrations, open houses, and local fairs or exhibitions. On an annual basis they work out a sales quota for each dealer and attempt to see that he realizes it. As will be shown later, all this supervision accounts for a substantial part of the machinery companies' branch-house distribution costs.

The farm machinery companies do not require exclusive dealerships, but they discourage dealers from selling competitive products of other manufacturers on the grounds that this will prevent the dealer from giving their products adequate attention.<sup>2</sup> In fact, all companies accept some joint dealerships in which one dealer represents two full-line or long-line companies. This is more likely to occur in areas where the company's product is less popular or the market is too scattered to support an exclusive dealership. No data are available for all Canada on the extent of joint dealerships, but the following table gives a picture of the situation in Saskatchewan in 1967. As these data show, all companies have some joint dealerships. In general, the proportion of joint dealerships declines as the size of the company's sales increases, but this pattern is not completely uniform. Cockshutt, for example, has a smaller proportion of joint dealers than Massey-Ferguson. Deere, the company that has pioneered the trend towards fewer and larger dealerships, has the smallest proportion of any company. Where joint dealerships exist, in very few instances do the major companies have the dependent franchise—defined as the franchise that yields the dealer less than half of total sales of new machines and parts (for the two major franchises). For the five major companies listed in the top

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<sup>2</sup> Ford is the only company requiring its dealers to sign a contract under which they agree not to carry competitive lines. The company may waive this requirement on occasion.

TABLE 10.2—EXTENT OF JOINT FRANCHISES IN SASKATCHEWAN, BY COMPANY, 1967

	All Franchises Number	Joint Dealers		Dependent Franchises	
		Number	Percentage of Total	Number	Percentage of Total
Massey-Ferguson International	189	38	20.1	—	
Harvester	163	29	17.8	4	2.5
John Deere	136	14	10.3	2	1.5
Cockshutt	148	26	17.6	5	3.4
Case	134	45	33.6	4	3.0
Minneapolis- Moline	101	74	73.3	25	24.8
Allis-Chalmers	56	31	55.4	21	37.5
Ford	44	19	43.2	11	25.0
Versatile	154	113	73.4	103	66.9
New Holland	98	69	70.4	54	55.1
Total	1,223	458	37.4	229	18.7

Source: P. Woroby, *Location and Performance of Farm Implement Dealers in Saskatchewan*, unpublished Commission study, 1969, based on records of Saskatchewan Agricultural Machinery Administration.

half of Table 10.2, dependent franchises constitute 3.5 per cent or less of the total. In contrast, two-thirds of Versatile's and 55 per cent of New Holland's franchises are dependent.

In the early postwar period, following the change from the agency to dealership basis of operation, the total number of dealers franchised by the major companies remained stable or even increased moderately for some companies. However, following the sharp drop in sales in 1954 a substantial reduction in dealer numbers took place. This decline has been especially marked in recent years and is apparently still continuing. As Table 10.3 shows, dealers franchised by the four major companies in Group I—Deere, Harvester, Massey-Ferguson, and White Motor—declined by about 16 per cent between 1962 and 1966, and have fallen by over one-third since then, bringing the total reduction since 1962 to 45 per cent. For the six companies in Group II—Case, Allis-Chalmers, Ford, New Holland, New Idea, and David Brown—the reduction has been less striking but still substantial, about 25 per cent since 1962. Because of the existence of joint dealerships, the total decline in the number would be less than this.

At one time, competition in the farm machinery industry took the form of blanketing the country with agents or dealerships. In an anti-trust suit in 1912 in the United States, International Harvester was accused of pursuing such a policy and keeping its competitors out of the market by requiring exclusive dealerships and practising full-line forcing. Recently, the emphasis has shifted from dealer numbers to dealer quality. Higher-quality dealers are usually those with large well-equipped facilities in larger centres. The change to this pattern takes place slowly because many existing dealers, although too small by present standards, have a clientele of long-standing customers who might be lost if their dealership was



TABLE 10.3—NUMBER OF FARM MACHINERY DEALER FRANCHISES,<sup>1</sup> GROUP I  
AND II COMPANIES, CANADA 1950, 1955, 1962-69

	<u>1950</u>	<u>1955</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>
Group I	3,112 <sup>2</sup>	2,963 <sup>2</sup>	2,934 <sup>3</sup>	2,880 <sup>3</sup>	2,768 <sup>3</sup>	2,615	2,453	2,139	1,849	1,609
Group II	1,108 <sup>4</sup>	1,635 <sup>5</sup>	1,901	1,885	1,849	1,673	1,652	1,602	1,532	1,434
Total (I and II)	4,220	4,598	4,835	4,765	4,617	4,288	4,105	3,741	3,381	3,043

Note: Group I includes John Deere, International Harvester, Massey-Ferguson and White Motor. Group II includes Allis-Chalmers, Avco (New Idea), J. I. Case, David Brown, Ford and New Holland.

<sup>1</sup>Count includes, where applicable, dealer establishments franchised by more than one farm machinery company.

<sup>2</sup>White Motor Corporation not included.

<sup>3</sup>Totals for Massey-Ferguson for years 1961 (not shown) to 1964 were determined by distributing the difference evenly between the years 1960 and 1965.

<sup>4</sup>Allis-Chalmers, Avco, David Brown and New Holland not included as no dealers listed.

<sup>5</sup>New Holland not included.

Source: Based on data supplied by the farm machinery companies in reply to the Royal Commission Questionnaire #2, re: Distribution Policies and Operations, and on correspondence with the companies.

closed out. In addition, it takes time to find individuals who have both the ability and financial resources needed to manage and develop a large dealership. The fact that the trend to larger dealerships has accelerated recently during a period of buoyant farm machinery sales may be due to the fact that the dealers in question have found it easier to finance the required expansion in this period.

It is clear that this pattern of retail distribution of farm machinery has been planned and organized by the farm machinery companies and reflects their response to competitive forces and the general requirements of the market as they interpret them. The decline in the number of dealers reflects the companies' assessment that the current market can be better served by a smaller number of larger dealers. What have been the economic developments that have produced these changes?

In part, these changes have been induced by changes in the farm machines themselves. Farm machinery has become more complex, sophisticated, and difficult to service. The widespread adoption of diesel engines on tractors with their complex fuel-injection systems, the increasing use of sophisticated hydraulics and sensing mechanisms, and the introduction of more-advanced types of transmissions, have increased the skill required from servicemen and the capital investment needed in service facilities. The sheer growth in the number of different types and models of machines has made the stocking of parts more difficult. All of these changes have favoured the growth of the larger dealer who can afford the investment in service facilities and parts-supply needed to adequately service the newer machines. The minimal service provided under the agency system would be completely intolerable in today's world.

Changes in the size of farm and in farming methods discussed elsewhere in this Report have reinforced this trend. The larger farmers who account for an increasing share of agricultural output are more likely to require the services provided by larger dealers. Such farmers often have larger and more sophisticated equipment which needs specialized attention. Further, modern farming methods that involve larger inputs, such as fertilizers, herbicides, and pesticides, have made the timing of farming operations more critical and have made delays caused by mistakes in ordering parts, or slow service, more costly to the farmer. To the degree that the larger dealer can provide better service—and a Commission survey indicates that mistakes by small dealers accounted for a disproportionate number of farmer complaints of poor service—these changes also have supported the shift to larger dealers.

Improvements in transportation and communication have also supported the growth of the larger dealers and the disappearance of many smaller dealers. The postwar period witnessed a great increase in the mileage of all-weather roads, particularly on the Prairies where the bulk of the Canadian farm machinery market is concentrated. With more and better roads, and more cars and trucks on farms, the farmer now does an increasing share of his shopping for all goods in larger population centres. This has favoured the growth of farm machinery dealerships in these centres relative to those in the smaller villages or hamlets.

These conclusions are supported by an analysis of changes in farm machinery dealerships (excluding short-line dealers) in the Province of Saskatchewan. The number of dealers for full- or long-line companies declined about 37 per cent between 1954 and 1967 and all but 14 per cent of this decline was due to the disappearance of dealers formerly located in villages, hamlets, or sidings. The data are as follows:

Reduction in Full-line or Long-line Farm Machinery  
Dealers, Saskatchewan, 1954-67

	1954	1967	Net Change
Towns and greater towns	549	461	-88
Smaller centres	1,146	608	-538
Total	1,695	1,069	-626

Moreover, this decline took place over a period in which total sales of farm machinery and parts increased by about 3.5 times. As a result, average sales of new machines at wholesale prices in 1967 were \$132,000 per dealer, compared with \$23,800 in 1954. The number of Saskatchewan dealers in 1967, expressed as a percentage of the number in existence in 1954, was as follows:

Location	Percentage	Location	Percentage
Greater Towns	92	Hamlets	45
Towns	64	Sidings	32
Villages	60	Province	63

The larger size of farm machines that has accompanied, and to a major degree caused the shift to larger farms has also given the farmer more incentive to shop for his new machines. At the same time the increased speed with which field operations can be performed has given him more time to do this shopping, and improvements in transportation have made it easier to travel to more distant points. It seems probable that this change also has favoured the growth of the large-volume dealer who, because of his larger volume, can sell individual machines at a lower mark-up over cost. This increased shopping for new machines must also have made the retail market more competitive, for not only would dealers for different companies in one town be in competition with one another, but dealers for the same company in different towns would be competing for some of the same business.

On the other hand, in the sale of repair parts and in the provision of service, it is less clear that the large centres will be favoured. However, even here, the larger dealer has some advantages. Many farmers have said they do not mind driving farther for repair parts if they can be provided with more assurance that they will get them when they arrive. A larger dealer who can afford a larger inventory of repair parts will find it easier to provide this assurance. During the public hearings a number of farmers on the Prairies indicated a willingness to drive up to 50 miles for repair parts. In the analysis of Saskatchewan dealerships referred to above, centres classified as towns were those situated from 20 to 35 miles apart. Greater towns

were over 35 miles apart. Villages were from 12 to 20 miles apart, hamlets from 7 to 12 miles distant, and sidings less than 7 miles apart. Thus the towns and greater towns come within the distance farmers expressed themselves as being willing to drive, and the increasing importance of dealerships in these centres confirms the views expressed.

For service, the increased size and cumbersomeness of machines, particularly combines, would appear to favour patronage of the repair and maintenance service provided by a nearby centre. However, this may well be offset by the increased complexity of machines, which makes them more difficult to service, and by the ability of the larger dealer to move machinery long distances on large low-bed trailers, and to support more expensive service facilities. In addition, some large dealers have established satellite service centres.

The trend towards fewer and larger dealers suggests that there are economies of scale in farm machinery retailing, with costs of operation falling as volume increases. What evidence is there to support this conclusion aside from the evident fact that small dealerships are declining in number and importance? Some data on costs by size of dealership support this conclusion. However, the data are not easy to interpret because of variations in the kind of service performed by different dealers, and the dispersed character of the market they serve. A dealer performs a variety of different functions. He sells a wide variety of new machines, ranging from large tractors and combines manufactured by full-line companies to the grain augers and sprayers produced by short-line firms. He sells parts and attachments. He may also sell a variety of related products such as trucks, industrial equipment, lawn and garden equipment, and snowmobiles. In addition, he provides repair services on existing machines.

The dispersed character of the market may also affect the size composition of firms that can operate efficiently. In a rich agricultural area the average size of dealer may be comparatively large. In more remote and poorer areas, dealerships may be much smaller. This is evident from provincial data. For the three largest farm machinery firms, in 1966 average sales per dealer were \$78,000 in the Atlantic Provinces, \$83,000 in Quebec, \$113,000 in Ontario, and \$133,000 in Saskatchewan. Similar variations may well occur within different parts of each province. The reason for this variation is quite clear. Given the limited distance farmers are prepared to travel to a dealer, many of the lower-income farming areas cannot support dealers for each major franchise of more than a moderate size. In a rich area, the economies of scale realized by a larger dealer can have freer play.

An annual survey of dealer operating expenses conducted by the National Farm and Power Equipment Dealers Association, and covering the experience of some 1,400 dealers in the United States and about 45 in Saskatchewan, provides data that are at least consistent with the view that economies of scale exist for farm machinery retailing. The results of the 1967 survey are summarized in Table 10.4.

For the three size groups for which data are presented, the gross operating profit, and accounted operating expenses as a percentage of sales, decline as the sales of dealers increase. The salary and wage data in this survey include an allowance for the proprietor's own labour. However, it does not include as a cost a return on the inventory of new and second-hand machines, which are typically financed on an interest-free basis by the farm machinery companies under floor-planning arrangements.

The omission of this cost would affect the estimate of costs, by size of dealer, since inventory turnover rates for the largest sales group (over \$500,000 annually) have been 50 per cent higher than for the smallest group (under \$250,000 annually) in each of the last ten years. While these interest costs are absorbed by the company rather than the dealer, the company may take account of them in its dealer policy. Further, for the smallest size group of dealers a larger share of total sales receipts comes from repair parts or service labour, and operating expenses in this business area would be higher.

However, after rough adjustments were made for these last two factors, operating expenses as a percentage of sales for the largest size group of dealers—those with sales over \$500,000—were about 6 per cent lower than those in the under-\$250,000 size category. If cost differences are this large, one would doubt the ability of the smaller dealers to survive. However, the smaller dealers may often operate in geographic areas where a larger dealer could not obtain the required volume, given the emphasis that companies place on exclusive dealerships and the fact that the dealer services provided under different franchises are not perfect substitutes. In addition, the small local dealer may be able to charge more since he saves the farmer the cost of going a longer distance. Dealers in smaller centres may also survive by accepting lower incomes. Data for Canada obtained from the 1961 Census of Retail Trade show significant economies of scale for dealers with annual sales up to \$200,000, but no substantial economies beyond that point. Since the original data did not include any allowance for the proprietor's income, an arbitrary addition of \$4,000 was made for each proprietor reported in each size class.<sup>3</sup> An allowance was also made for the cost of floor-planned inventory, since inventory turnover rates increase as the size of dealer increases, up through the \$1 million level. The relevant data are given in Table 10.5.

As this table shows, operating expenses (adjusted for proprietor's salaries), as a percentage of sales, decline steadily up to the \$200,000 sales level. Thereafter, they level off, although the expense ratio in the \$200,000 to \$500,000 sales category at 13.9 per cent is substantially lower than in the \$100,000 to \$200,000 category, 15.6 per cent. This suggests that the most efficient size of firm may be somewhere in the sales range of \$300,000 to \$500,000. Operating expenses as a percentage of sales, after adjustment for both the proprietor's wage and the cost of

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<sup>3</sup> Since wages increase with size of establishment, this constant addition will tend to exaggerate economies of scale. However, the proportion of incorporated firms also increases with size, and in these firms the owner's earnings are already included.

TABLE 10.4—STATISTICS ON DEALERS, CLASSIFIED BY SALES-SIZE, 1967

	All Dealers		Dealers Under \$250,000		Dealers \$250,000-\$500,000		Dealers Over \$500,000	
	Dollar Values	Percentage of Total Sales	Dollar Values	Percentage of Total Sales	Dollar Values	Percentage of Total Sales	Dollar Values	Percentage of Total Sales
	(\$'000)		(\$'000)		(\$'000)		(\$'000)	
I Summary of Financial Statements								
Average sales per dealer	604.4	100.0	165.6	100.0	379.6	100.0	889.0	100.0
Cost of goods sold <sup>1</sup>	529.6	87.6	141.3	85.3	331.2	87.2	781.2	87.9
Gross profit <sup>2</sup>	74.8	12.4	24.3	14.7	48.4	12.8	107.8	12.1
Total accounted expenses	73.9	12.2	22.8	13.8	46.9	12.4	107.5	12.1
Net profit on business	0.9	0.2	1.5	0.9	1.5	0.4	0.3	0.0 <sup>8</sup>
Other income	19.1	3.1	4.7	2.8	12.3	3.2	28.0	3.2 <sup>9</sup>
Net profit before tax	20.0	3.3	6.2	3.7	13.8	3.6	28.3	3.2
Imputed inventory interest <sup>3</sup>								
Net profit after adjustment for imputed inventory expense	12.6	2.1	5.0	3.0	9.7	2.5	16.7	1.9
	7.4	1.2	1.2	0.7	4.1	1.1	11.6	1.3
II Operating and Financial Statistics								
Sales analysis (total sales = 100)								
New equipment	57.5%		54.9%		58.6%		57.4%	
Used equipment	16.8%		14.1%		15.9%		17.2%	
Repair parts	15.7%		20.2%		16.4%		15.2%	
Service labour	5.1%		5.6%		4.8%		5.2%	
All other lines	4.9%		5.2%		4.4%		5.0%	
Average number of employees	10.4		4.0		7.5		13.9	
Sales per employee (\$'000)	\$58.1		\$41.4		\$50.6		\$64.0	

Gross profits (percentages of sales by type of goods)				
New equipment	11.1%	11.7%	11.7%	10.9%
New and used equipment	8.4%	10.8%	9.6%	7.9%
Repair parts	25.6%	25.7%	24.8%	25.8%
Expenses (selected)				
Interest and bank charges (\$'000)	\$ 2.4	\$ 1.0	\$ 1.7	\$ 3.4
Wages and salaries (\$'000) <sup>4</sup>	\$56.1	\$16.1	\$35.8	\$81.9
Average wage per employee (\$'000)	\$ 5.4	\$ 4.0	\$ 4.8	\$ 5.9
Total inventories (\$'000)	\$199.5	\$79.8	\$152.1	\$267.9
Inventory turnover rate	2.7	1.8	2.2	2.9
Total assets (\$'000) <sup>5</sup>	\$297.9	\$121.6	\$217.6	\$405.5
Return on assets <sup>6</sup>	7.5%	6.0%	7.1%	7.8%
Return on assets after adjustment for interest charges and imputed inventory expenses <sup>6</sup>	2.5%	1.1%	1.9%	2.8%
Net worth (investment) (\$'000)	\$107.7	\$47.5	\$78.7	\$145.5
Return on investment <sup>7</sup>	18.6%	13.1%	17.5%	19.5%

<sup>1</sup> Derived from total sales less gross margin.

<sup>2</sup> Excludes volume bonus. Volume bonus, in part, would be included in "Other income".

<sup>3</sup> The imputed inventory cost figure was computed on the basis of 7.5 per cent of the value of inventory less actual interest expense, assumed conservatively to be entirely cost of dealer's own inventory (e.g. parts). In practice, of course, this must include other items.

<sup>4</sup> Including wages of service labour, derived by deducting gross margin for service labour from sales of service labour. (3.8 percentage points of the 9.3 per cent (equalling \$56,100) is therefore not included in total accounted expenses in the "total" column.)

<sup>5</sup> Return on assets defined as net operating profit before tax plus interest expense as a percentage of total assets.

<sup>6</sup> Return on assets defined as net operating profit before taxes plus interest expense less imputed inventory costs as a percentage of total assets.

<sup>7</sup> Return on investment is as reported in *Cost of Doing Business Study*. The estimate reflects the financial statements of dealers only and therefore neglects the cost of financing inventory.

<sup>8</sup> Actually 0.03 per cent.

<sup>9</sup> Actually 3.14 per cent.

Source: D. Schwartzman, *Oligopoly in the Farm Machinery Industry*, Royal Commission on Farm Machinery Study No. 12 (Ottawa: Information Canada, 1970), Table 8.1 (taken from National Farm & Power Equipment Dealers Association, *Cost of Doing Business Study for 1967* (St. Louis, Mo.), 1967).

TABLE 10.5—SIGNIFICANT FARM MACHINERY DEALERSHIP STATISTICS AND RATIOS BY SIZE OF DEALERSHIP IN SALES DOLLARS  
(Taken from replies to Dominion Bureau of Statistics 1961 Census of Merchandising)

	Size of Dealership in Thousands of Dollars of Sales										
	Under		10-		20-		30-		50-		Over
	10	Total	20	5.1	30	5.6	50	15.3	100	200	
Percentage distribution of dealers	4.8	100.0%	5.1	27.6	22.7	16.4	2.2	0.3			
Sales as a percentage of total sales	0.2	100.0%	0.5	15.7	24.9	36.8	10.7	5.5			
Value of sales per dealership (\$'000)	5.0	\$128.8	14.8	73.1	140.9	288.7	640.0	2,432.6			
Value of sales per employee (\$'000)	4.0	\$ 38.3	9.9	30.6	37.6	46.2	50.7	89.2			
Gross margin per dealership (\$'000)	1.6	\$ 22.0	3.7	13.1	24.6	46.1	101.8	434.4			
Profit before tax per dealership (\$'000)	0.1	\$ 5.1	1.0	3.4	6.5	8.8	15.0	127.4			
Profit (adjusted) <sup>1</sup> per dealership (\$'000)	-3.9	\$ 1.4	-3.2	-0.6	2.7	6.2	13.9	125.9			
Number of employees per dealership	1.2	3.4	1.5	2.4	3.7	6.3	12.1	27.3			
Cost of sales as percentage of sales	51.5	77.8%	56.0	77.5	77.6	79.7	77.8	74.3			
Gross margin as percentage of sales	31.5	17.1%	25.0	17.9	17.5	16.0	15.9	17.8			
Operating expenses as percentage of sales	28.7	13.1%	18.1	13.2	12.9	13.0	13.6	12.6			
Operating expenses as percentage of sales (adjusted to include proprietors' salaries)	110.4	15.0%	46.8	18.7	15.6	13.9	13.8	12.6			
Profit before tax as percentage of sales	2.8	4.0%	6.9	4.7	4.6	3.0	2.3	5.2			
Profit before tax (adjusted to include proprietors' salaries) as percentages of sales	-78.9	1.1%	-21.8	-0.8	1.9	2.1	2.1	5.2			
Inventory turnover rate	1.3	3.5	1.5	3.2	3.5	3.6	4.4	6.1			
Inventory costs (7.5% of inventory) as percentage of sales	2.9	1.6%	2.8	1.8	1.7	1.7	1.3	0.9			
Operating expenses (adjusted for proprietors' salaries and inventory costs) as percentage of sales	113.4	17.7%	49.5	20.5	17.2	15.5	15.1	13.5			

<sup>1</sup> Adjusted for proprietors' salaries.

Source: Taken from D. Schwartzman, *Oligopoly in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 12 (Ottawa: Information Canada, 1970), Table 8.3 and Commission estimates.



floor-planning, continue to decline slowly throughout the sales range shown in Table 10.5. Since only seven firms in the sales category of \$1 million and over provided detailed financial statements, not much confidence can be placed in the estimate for this sales level. Dealers with annual sales of less than \$100,000 accounted for only 16 per cent of total sales in 1961, and it seems likely that many of these dealers will have disappeared in the past few years. Some of the higher operating-expense ratios shown by smaller dealers may reflect a larger proportion of sales in the parts and service category. However, no information on the proportion of sales by category is available. The above data are at least consistent with the hypothesis that the most efficient size of dealer is comparatively large, with annual sales of \$300,000 or more.

TABLE 10.6—SALES PER EMPLOYEE, BY SIZE OF DEALERSHIP AND GEOGRAPHIC AREA, FARM MACHINERY, CANADA, 1961

(Thousands of dollars)

Size of Dealer by Volume of Sales	Canada	Maritimes	Quebec	Ontario	Prairies	British Columbia
All dealers	38.3	31.3	34.3	33.7	41.9	38.9
Under 10	4.0	5.6	2.9	3.6	4.5	5.1
10-20	9.9	11.6	10.5	9.4	9.9	8.6
20-30	15.5	16.3	15.2	14.8	16.2	—
30-50	23.6	22.9	25.9	22.3	23.6	22.3
50-100	30.6	27.9	29.6	29.0	32.2	30.8
100-200	37.6	31.5	37.3	33.3	40.9	39.9
200-500	46.2	36.0	45.4	41.6	49.6	36.6
500-1,000	50.7	57.4	54.0	44.2	59.8	39.7
1,000 and over	89.2	—	—	59.2	131.9	58.6

Note: Sales per employee were obtained by dividing dollar sales by the number of employees and proprietors.

Source: Dominion Bureau of Statistics Special Machine Runs of Census of Merchandising and Service Establishments, 1961.

Data on sales per employee also increase fairly consistently with the size of dealership, thus providing some additional evidence of economies of scale. As Table 10.6 shows, there are some irregularities in this pattern on a regional basis, but in all areas sales per employee reach their peak when total sales are \$500,000 or over.

In 1961, 58 per cent of all farm machinery dealers in Canada had annual sales below \$100,000, yet these dealers accounted for only 22 per cent of total sales. About 31 per cent of all dealers had sales below \$50,000 annually. How have these small dealers survived? Smaller dealers have fewer employees and may often pay lower wages. Some of the dealers in the lower sales category may have commenced operating during the year. Smaller dealers also have a larger gross margin, suggesting that more of their sales were concentrated in the parts or service category.

Views expressed during the Commission hearings are at least consistent with these conclusions. Cockshutt suggested that the minimum size required for an efficient dealer operation on the Prairies would be the annual purchase from the company of \$100,000 in wholegoods and parts at wholesale prices.<sup>4</sup> Ford suggested that the minimum size required for a viable dealership was \$150,000 in retail sales, which would probably involve the sale of 15 tractors each year.<sup>5</sup> C.C.I.L. stated that \$150,000 retail would be economic, but that costs would continue to decline up to the \$250,000 level measured in terms of annual sales of new equipment.<sup>6</sup> International Harvester suggested as a minimum, purchases at wholesale prices of from \$50,000 to \$60,000 annually.<sup>7</sup> Similarly, Massey-Ferguson suggested the minimum needed for a viable dealer at \$80,000 to \$100,000 in wholegoods sales (presumably at wholesale prices).<sup>8</sup> When allowance is made for sales of service parts and repair services along with sales of used machines and short-line products, total retail sales might be twice the level measured in terms of wholegoods and parts at wholesale prices. Thus the minimum of \$100,000 purchases at wholesale would mean \$170,000 or \$200,000 at retail.

A number of companies also provided the Commission with data on the number of dealers required to provide 50, 70, and 100 per cent of their sales: For five major full-line companies an analysis of these data gives the following results:

	Percentage of All Dealers	Purchases of Whole- goods and Parts	Estimated Total Sales at Retail
		(Average annual amount per dealer)	
All dealers	100	\$107,000	\$180,000 to \$200,000
Largest dealers accounting for 50 per cent of sales	22	\$240,000	\$410,000 to \$480,000
Next largest dealers accounting for next 20 per cent of sales	16	\$136,000	\$230,000 to \$270,000
Smallest dealers accounting for remaining 30 per cent of sales	62	\$ 52,000	\$ 90,000 to \$100,000

<sup>4</sup> Royal Commission on Farm Machinery, Transcript of Evidence, *Hearings*, Vol. No. 28, November 13, 1967, p. 2888.

<sup>5</sup> *Ibid.*, Vol. No. 31, November 16, 1967, p. 3351.

<sup>6</sup> *Ibid.*, Vol. No. 34, December 13, 1967, p. 3750.

<sup>7</sup> *Ibid.*, Vol. No. 32, December 11, 1967, p. 3443.

<sup>8</sup> *Ibid.*, Vol. No. 37, January 9, 1968, p. 4104.

These data take no account of the existence of joint dealerships. Thus some of the smaller dealers might also hold franchises from other full-line or long-line companies, and this would raise their average sales level.

Analysis of the trend in dealer operating costs over the postwar period suggests that substantial economies have been realized as a result of the move to fewer and larger dealers. Historical data for Canada are not available. However, data for dealers in the United States and Saskatchewan indicate that the gross profit earned by dealers declined from around 25 per cent in the early postwar years to around 15 or 16 per cent in the years 1965 to 1967 (see Table 10.7). If the new and used equipment business is treated as a combined operation (with used machines on a break-even basis) then the profit on new and used machines, as a percentage of new equipment sales alone, shows a roughly comparable decline, from 15 to 17 per cent in the years 1949 to 1951 to about 8 per cent for the years 1965 to 1967. These last data do not include the volume bonus which would add around 3 per cent to both these figures.

While complete information on dealer trade discounts granted by the companies is not available, information from several companies indicates that these discounts have increased moderately over the postwar period. Deere gave a dealer trade discount on new machines of 16 per cent from 1948 to 1955, 20 per cent from 1956 to 1963, and 23 per cent from 1964 to 1968. Massey-Ferguson's discount was 15 per cent in 1950-51, 16 per cent in 1952, 17.5 per cent from 1953 to 1957, and 23 per cent from 1958 onward. International Harvester maintained a discount of 20 per cent from 1948 to 1959 and increased this to 22 per cent in 1960. J. I. Case had an average discount of about 19 per cent from 1948 to 1958, and has since increased it to 23 per cent. As noted, volume bonuses would be additional.

Despite the allowance of higher discounts, operating margins have been declining. This decline in margins reflects a decline in operating expenses as a percentage of sales from about 15 or 16 per cent in the earlier postwar years to just over 12 per cent in 1967 (see Table 10.7). Some of this decline in expenses reflects an increase in the ratio of sales of new and used equipment to total sales. Expenses on the sale of repair parts and for repair services are higher than on sales of new machines. However, the decline in expenses would be significant even without this change. The ratio of net profits before taxes to total sales has remained relatively constant at from 3 to 3.5 per cent of sales over the past decade. The return on investment earned by dealers has increased very appreciably, while the return on total assets has shown only a comparatively small increase. Inventory turnover was exceptionally high in the immediate postwar years when, because of the severe shortage, machinery moved almost directly from the dealer's lot to the farmstead. Since 1954 there has been a moderate decline in inventory turnover.

It seems likely that these apparently conflicting trends are a direct reflection of the introduction of floor-planning on an interest-free basis by the machinery companies in the mid-fifties. This free floor-planned inventory appears as part of

TABLE 10.7—PROFIT AND RELATED DATA FOR FARM MACHINERY DEALERS, 1947-67

	Gross Profit			Operating Expenses	Profit Before Tax	Sales of New and Used Machines	Profit on New and Used Equipment	Inventory Turnover: New Machines <sup>2</sup>	Return on Total Assets <sup>5</sup>	Return on Investment	Average Number of Employees
	Including Other Income <sup>1</sup>	Excluding Other Income <sup>1</sup>	(As percentage of total sales)								
	----- (As percentage of total sales)-----										
1947	24.7	21.9	15.3	9.4	61.4	20.0	6.6 <sup>3</sup>	n.a.	n.a.	n.a.	n.a.
1948	23.9	21.3	16.1	7.8	55.7	20.0	n.a.	n.a.	n.a.	n.a.	n.a.
1949	22.9	19.1	17.4	5.5	58.5	17.1	4.0 <sup>3</sup>	n.a.	n.a.	n.a.	n.a.
1950	20.9	18.0	15.9	5.0	63.2	16.2	4.7 <sup>4</sup>	n.a.	n.a.	n.a.	n.a.
1951	19.7	17.0	15.1	4.6	61.8	15.0	3.6 <sup>4</sup>	n.a.	n.a.	n.a.	n.a.
1952	20.2	17.1	16.3	3.9	62.0	13.8	3.2	n.a.	n.a.	n.a.	n.a.
1953	17.9	14.9	15.4	2.5	58.9	11.7	2.7	n.a.	n.a.	n.a.	n.a.
1954	18.3	14.8	15.7	2.6	61.3	11.4	3.0	5.8	7.4	n.a.	n.a.
1955	18.2	15.3	14.8	3.4	61.1	12.0	2.8	8.1	10.6	n.a.	n.a.
1956	19.0	15.9	15.8	3.2	59.4	12.0	3.1	9.1	11.9	n.a.	n.a.
1957	18.6	15.9	15.2	3.4	60.6	12.7	2.5	7.8	11.0	n.a.	n.a.
1958	17.6	14.8	14.2	3.4	64.8	11.0	2.7	7.9	13.2	n.a.	n.a.
1959	17.5	14.7	14.2	3.3	65.3	10.9	2.3	7.3	13.3	n.a.	n.a.
1960	17.9	15.1	15.1	2.8	63.9	10.2	2.5	6.5	10.6	n.a.	n.a.
1961	17.7	14.7	14.6	3.1	66.2	10.2	2.5	6.7	11.2	8.0	8.0
1962	17.2	14.3	13.9	3.3	67.4	9.3	3.0	7.9	14.5	9.0	9.0
1963	17.0	14.0	13.7	3.3	70.7	9.5	3.2	8.0	15.0	9.3	9.3
1964	16.6	13.6	13.3	3.3	69.2	8.9	3.0	8.1	15.8	10.8	10.8
1965	15.9	13.0	12.7	3.2	71.2	8.2	3.3	8.1	16.4	10.9	10.9
1966	15.7	12.8	12.2	3.5	73.9	8.6	2.7	8.4	19.5	10.5	10.5
1967	15.5	12.4	12.2	3.3	74.3	8.4	2.4	7.5	18.6	10.4	10.4

<sup>1</sup> Part of other income is made up of volume bonus.

<sup>2</sup> Calculated as ratio of cost of goods sold for new machines only divided by year-end inventories of new machines.

<sup>3</sup> Rate taken directly from *Cost of Doing Business Study* and includes both new and used equipment.

<sup>4</sup> Rate taken directly from *Cost of Doing Business Study*. For other years, 1952-67, rate was calculated by Commission staff.

<sup>5</sup> Return on total assets defined as net operating profit before tax plus interest expense as a percentage of total assets.

Source: National Farm & Power Equipment Dealers Association, *Cost of Doing Business Study* (St. Louis, Mo.), annual publication, 1947-67.

the dealer's total assets but is provided on an interest-free basis. The introduction of free floor-planning undoubtedly induced the dealer to carry a larger inventory, but without adding significantly to his total costs. For this reason a comparatively constant return on total assets including floor-planned inventory could yield a larger return to owners' equity.

Some historical data suggest that dealer profits measured as a return on equity have declined, compared with their level in 1929 or 1935 and 1936. Gross margins also appear to be lower now than they were in the prewar period. The Federal Trade Commission estimated the average gross margin in the United States in 1936 at about 23 per cent, appreciably higher than the 15.5 per cent recorded by dealers in 1967. This reduction in profits and operating margins undoubtedly reflects efficiencies resulting from the move to larger and more efficient dealers, and has been fostered by increased dealer competition.

### Wholesale Distribution

A major part of the wholesale distribution of farm machinery in Canada is performed by the full-line and long-line companies themselves, through their branch office distribution system. These firms along with C.C.I.L. account for over 80 per cent of all the farm machinery sold in Canada. The rest is sold through independent distributors. The following analysis of wholesale distribution costs is confined mainly to the costs of these full-line and long-line companies.

Using data obtained from a financial questionnaire completed by all the major firms in the industry, and supplementing this with data obtained from company briefs and the Commission hearings, it has been estimated that the marketing costs of the larger firms currently amount to about 17 per cent of their net sales to dealers. These costs can be broken down as follows:

	Percentage of Manufacturer's Net Sales (1960-66 Averages)
Cost of branch operations	7.8
Advertising	1.3
Head office costs attributable to marketing	2.9
Investment costs (imputed)	5.0
Total	17.0

As these data indicate, the major marketing cost is the cost of running the branch offices. Another important component of costs is the cost of floor-planning new and second-hand machines in the hands of dealers. An estimate of the investment cost of carrying these inventories in the form of non-interest-bearing accounts receivable from dealers has been made, using an arbitrary 7.5 per cent interest cost.<sup>9</sup>

<sup>9</sup> The total cost in dollars was estimated by applying this 7.5 per cent to the average amount of dealer receivables outstanding. This amount calculated as a percentage of total net sales provided the estimated 5.0 per cent.

A somewhat more detailed breakdown of the branch office costs is given in Table 10.8. This table also shows the decline in this cost ratio over the period 1962 to 1966 as sales increased by 75 per cent. As this analysis shows, a major part of branch office costs are for blockmen (district or territory managers). Salaries and travel costs of blockmen were estimated at about 2.7 per cent of sales in 1966. The functions performed by blockmen were described in some detail above. Another significant component of branch office costs is that of the salaries and travel costs of technical personnel "who spend most of their time in the field instructing dealers and, to some degree, farmers in the field assembly of MF machines, their adjustment, operation, maintenance and repair".<sup>10</sup> The branch also stocks repair parts and new machines, and serves as the administrative and sales headquarters for the region.

There is some basis for believing that there are economies of scale in wholesale distribution. For instance, there is direct evidence that selling expenses as a percentage of sales decline as the level of total sales increases. The Commission's analysis suggests that selling expenses for a firm with annual sales of \$20 million would be about 10 per cent of net sales, compared with 7.2 per cent for a firm with annual sales of \$60 million.

TABLE 10.8—BRANCH OFFICE MARKETING COSTS AS PERCENTAGE OF NET SALES, NINE MAJOR FULL-LINE AND LONG-LINE FARM MACHINERY MANUFACTURERS, CANADA, 1962 AND 1966

	1962	1966
<u>Index of domestic sales<sup>1</sup></u>	100	181
	<u>Percentage of Net Sales</u>	
Personnel costs, including travel		
Sales (mainly blockmen)	3.2	2.6
Technical	1.4	1.1
Repair parts	0.9	0.7
Wholegoods	0.7	0.6
Administration	0.9	0.7
Total personnel costs	7.1	5.7
Occupancy costs	1.0	0.9
Miscellaneous (postage, telephone, stationery)	0.5	0.4
Total branch accounted operating costs	8.6	7.0
Imputed investment costs		
Wholegoods and repair parts inventories and dealer receivables	6.0	5.0
Total branch office costs	14.6	12.0

<sup>1</sup> Data are for eight companies.

Source: From D. Martinusen and B.P. Barry, *Revenues, Costs and Profits in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 11 (Ottawa: Information Canada, 1970), Table 7.5.

<sup>10</sup> Massey-Ferguson Industries Limited, *Brief to the Royal Commission on Farm Machinery*, Ottawa, January 1968, Vol. I, Ch. V, p. 17.

Further, an analysis of the function performed by blockmen suggests that economies of scale may be present and that these economies relate to the average size of dealership. The larger companies apparently have one blockman for every 8 to 12 dealers. Small companies have one blockman for every 12 to 15 dealers. Assume that the cost to the company of such a person is \$20,000 for salary, fringe benefits, and travel expenses. If each blockman calls on 10 dealers, the average cost per dealer will be \$2,000 annually. This is 2 per cent of sales for dealers selling \$100,000 annually compared with 4 per cent where annual sales are only \$50,000. To some degree, where sales are smaller a blockman may cover a larger number of dealers. But some officials suggested at the Commission's public hearings that the number of dealers under the supervision of one blockman may be related more to the size of the territory covered than the total sales volume. There may well be similar economies in technical personnel and other branch-house costs where the average size of dealer increases. In fact, average sales per dealer in 1966 for 10 full-line and long-line companies varied between \$22,000 and \$137,000.

The reduction in selling costs as a percentage of sales as total company sales increase probably reflects the fact that companies with larger sales have larger dealers. In other words, much of the economies of scale obtainable at the wholesale level may result from the economies obtained from servicing and supporting a smaller number of larger dealers. There is a fairly strong relationship between the size of a company's total sales and the average size of its dealers. In addition, some overhead costs such as central and branch-house inventory costs may decline as a percentage of sales as total sales volume increases, with average sales per dealer held constant.

Support for this view is also provided by an analysis of the distribution costs incurred by C.C.I.L. C.C.I.L. distributes its products through 60 large depots. In 1966, average sales per depot were about \$250,000, measured in terms of wholesale prices of new machines and repair parts. This contrasts with annual sales per dealer of \$137,000 for the private company with the largest dealers and an average of \$91,000 for 10 full- and long-line companies. Yet C.C.I.L.'s distribution costs, shown in their financial statement under the heading of "sales, service, parts administration, administration and general expenses", over the period 1960 to 1966 amounted to only 2 per cent of sales. This compares with the private companies' branch-operating costs of 8 per cent. Compared with most of the full- and long-line firms, C.C.I.L. is a comparatively small firm, having sales in 1966 of new machines and parts at wholesale prices of about \$14 million. Too much should not be made of this difference, because C.C.I.L. operates on a somewhat different basis and is only now introducing the equivalent of blockmen. Still, the results are suggestive. A comparison of the level of selling, general and administrative costs for C.C.I.L. and a selected number of other firms or groups of firms is given in Table 10.9.

Another important area of cost at the wholesale level is the cost of carrying parts and wholegoods inventory, including the cost of floor-planning new and used machines in the hands of the dealer. There is evidence that this cost area also

TABLE 10.9—SELLING, GENERAL AND ADMINISTRATIVE EXPENSES,  
SELECTED CANADIAN AND INTERNATIONAL FARM MACHINERY COMPANIES,  
1960-67

	(Percentage of wholesale sales)							
	1960	1961	1962	1963	1964	1965	1966	1967
Financial questionnaire — major Canadian companies	10.4	11.5	10.1	8.6	7.8	7.2	7.0	
Financial questionnaire — complete sample of Canadian companies	12.2	12.8	11.2	9.7	8.8	8.3	7.9	
Deere & Company	12.8	12.4	12.0	11.4	11.8	11.1	10.3	10.6
International Harvester (Chicago)	11.2	12.0	11.0	11.5	10.6	10.7	10.5	
International Harvester (Canada)	10.3	11.1	10.3	9.5	8.8	8.4	7.8	7.8
Massey-Ferguson Limited	12.4	13.0	12.9	12.7	12.0	12.3	12.1	
Versatile Manufacturing Limited					2.5	4.9	3.8	3.9
C.C.I.L.	1.7	2.3	2.3	1.7	1.3	1.5	2.8	3.3

Source: R. Simkin, *The Prairie Farm Machinery Co-operative*, Royal Commission on Farm Machinery, Study No. 5 (Ottawa: Queen's Printer, 1970), Table C.2.

declines as the average size of dealer increases. Inventory turnover rates increase as the average size of dealer increases. Reference has already been made to the fact that in the *Cost of Doing Business Study*, inventory turnover rates for the largest class of dealers were shown to be 50 per cent higher than those for the smallest class. A similar increase in turnover rates is evident from Canadian Census data for all dealer sales categories up to the very largest (see Table 10.5).

As Table 10.10 shows, turnover rates for distribution assets tended to rise as total industry sales increased from 1960 to 1966. On the other hand, the average turnover rate for the four largest companies in Group I was consistently lower than that shown by the six companies in Group II, despite the fact that the average dealer size in the latter group of companies was appreciably smaller.<sup>11</sup> However, the picture is muddled by the fact that more of the franchises granted by Group II companies would be joint dealerships, so the average size of the dealers would in fact be larger than shown by averages based on individual companies' sales. Turnover rates for distribution assets are still higher for Versatile and the Group IV companies. The comparatively high turnover rates for the smaller firms in Group IV undoubtedly are due to the relative absence of interest-free floor-planning arrangements for this group of companies. Versatile's turnover rate for distribution assets has been declining as it has had to introduce interest-free floor-planning arrangements to compete with the established firms. Turnover rates vary widely between different companies, ranging from 0.9 to 1.8 for Group I companies and

<sup>11</sup> The composition of each of these groups is described in Chapter 12.



from 0.9 to 2.0 for Group II companies. Some of these differences between different companies may reflect company policy and product mix.

TABLE 10.10—TURNOVER RATES OF WHOLESALE DISTRIBUTION ASSETS OF CANADIAN FARM MACHINERY FIRMS, BY GROUP, 1960-66

	Group I <sup>1</sup>	Group II <sup>1</sup>	Group III <sup>2</sup>	Group IV <sup>3</sup>
1960	1.0	1.1	n.a.	2.8
1961	0.9	1.3	n.a.	2.9
1962	1.1	1.4	n.a.	4.2
1963	1.4	2.0	3.3	2.8
1964	1.5	1.9	2.7	3.8
1965	1.4	1.9	2.5	4.0
1966	1.3	2.1	2.1	3.8
Average	1.2	1.7	2.4	3.6
1967			1.7	
1968			1.5	
Average 1963-68	n.a.	n.a.	1.9	n.a.

n.a. — not available.

<sup>1</sup>Three companies in Group I, 5 in Group II.

<sup>2</sup>From *Annual Reports* of Versatile Manufacturing Ltd. Based on total sales to accounts receivable since inventory figures were not broken down between factory inventories and distribution inventories. However, it is likely that accounts receivable cover the majority of wholesale distribution assets in the case of Versatile.

<sup>3</sup>Consisting of 3 companies in 1960, 5 in 1961 and 1962, and 6 from 1963 to 1966.

Source: D. Martinusen and B.P. Barry, *Revenues, Costs and Profits in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 11 (Ottawa: Information Canada, 1970), Table 7.9.

If it is true, as has been argued above, that wholesale distribution costs decline appreciably as the average size of dealer increases, there must be room for considerable further savings in this area. As was demonstrated in Table 10.5, the small dealers who account for approximately the bottom 30 per cent of total sales constitute about 60 per cent of all dealers. Suppose all of these dealers were eliminated over the course of a number of years and their sales redistributed among the larger dealers. Average sales per dealer of the remaining dealers (for new machines and parts at wholesale prices)—those who now account for 70 per cent of company sales—would increase from \$196,000 to \$282,000 (as of 1966). If costs for blockmen vary directly with number of dealers, this cost would fall from its 1966 level of 2.6 per cent of sales to about 1.1 per cent. Other personnel costs would probably fall too, but by a smaller extent. Let us suppose they decline by 20 per cent, or by about 0.6 per cent of sales. Thus the reduction in dealer numbers would provide a saving at the wholesale level of around 2 per cent of sales. There might also be some saving on company-held inventory. In addition, since inventory turnover rates for large dealers are significantly higher than for small dealers, there would be some additional saving on the cost of floor-planning dealer wholegoods inventory. Thus the total saving could range from 2 to 2.5 per cent of sales.

However, to the extent that this neglects the existence of joint dealerships it may contain some element of overestimate.

The other element of marketing cost, advertising, is comparatively small. The 10 full-line and long-line companies in Groups I and II of the Commission's financial questionnaire reported advertising expenditures averaging between 1 and 2 per cent of manufacturer's net sales. This percentage declined for all firms over the period 1960 to 1966 as advertising expenditures remained fairly constant in spite of an 80 per cent increase in sales. There is also a marked variation in the level of advertising expenditures for different firms. As a percentage of sales, expenditures ranged from 1.2 to 2.5 per cent in 1962 and from 0.6 to 2.4 per cent in 1966. Moreover, there is little evidence that higher advertising expenditures are accompanied by larger market shares.

Although no complete information for the industry is available, there has apparently been a substantial decline in the number of wholesale branches operated by the older established companies. Massey-Ferguson reported that it had reduced the number of its branches from 15 in the 1940s to 5 in 1966. This decline occurred during the period in which the company was changing from an agency to a dealership basis of operation, with the number of agents or dealers declining from 1,957 in 1944 to 720 in 1966. Total employment at its branches declined from a level in the early forties of about 1,500 (together with an additional 1,500 temporary staff in the fall) to about 450 in 1966. Although the reduction in the number of branches undoubtedly provided some saving, a large part of the total saving must have been due to the change from the agency to the dealership system, with the dealers assuming many functions formerly carried out by the branch.

Offsetting the decline in branches operated by the older companies would be the establishment of new branches by recent entrants to the industry such as New Holland, New Idea, and David Brown. New entrants usually operate through an independent distributor when they first begin to sell in the Canadian market, but when they become well established they often set up their own wholesale distribution network. This may occur with annual Canadian sales as low as \$500,000.

U.S. Census data indicate a comparable decline in manufacturers' wholesale distribution outlets. The number of these branches declined from 330 in 1939 to 223 in 1963 (see Table 10.11). Most of this decline occurred between 1954 and 1958. These wholesale outlets also experienced a sharp decline in operating expenses as a percentage of sales, from 15.6 per cent in 1939 to 6.9 per cent in 1963. Some of this decline may reflect the shift from an agency to a dealership basis of operation, although, for some companies at least, the change to a dealer system occurred as early as the 1920s in the United States. The Census data also show a sharp increase in sales (at constant dollars) per employee and a marked increase in the inventory turnover ratio. On the employment side there was evidently a major structural change between 1954 and 1958 with employment declining one-third. The increase in inventory turnover undoubtedly reflects the

TABLE 10.11 - TRENDS IN U.S. MANUFACTURERS' SALES BRANCHES AND OFFICES, 1939-63

Number of Establish- ments	Total Sales	Inventory	Inventory Turnover Rate	Total Sales at Constant Prices <sup>1</sup>		Employment	Sales Per Employee at Constant Prices <sup>1</sup>		Operating Expenses
				(\$ million)	(Index 1939 = 100)		(Dollars)	(Index 1939 = 100)	
1939	330	291.0	51.1	5.7	418.1	100	33,729	100	15.6
1948	302	1,510.0	112.6	13.4	1,489.2	356	102,245	303	5.7
1954	299	1,292.9	204.3	6.3	1,058.0	253	78,300	232	8.6
1958	221	1,419.6	110.6	12.8	1,020.6	244	113,011	335	6.4
1963	223	1,685.7	149.8	11.2	1,094.6	262	119,996	356	6.9

<sup>1</sup> Deflated by U.S. Department of Labor, Wholesale Prices and Price Indexes (Agricultural Machinery & Equipment), 1947-49=100.

Source: D. Schwartzman, *Oligopoly in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 12 (Ottawa: Information Canada, 1970), Table 8.10.

introduction of interest-free floor-planning which effectively moved inventory from branch yards and warehouses to dealer premises. The investment cost of this interest-free floor-planning would not appear in the operating expenses of the sales branches. Thus the 6.9 per cent shown for operating expenses in 1963 would be comparable to the 7.0 per cent for 1966 in Canada (see Table 10.8). The data are not fully comparable; the U.S. Census data are based on a complete industry survey, whereas the Canadian data are for large firms which account for about 75 per cent of Canadian sales.

Suppose there were a smaller number of firms marketing farm machinery in Canada. Would there be significant savings in wholesale distribution costs? While it is not easy to give a conclusive answer to this question, the Commission's analysis suggests that the savings would not be large, and most of those that did occur would reflect a shift towards a larger average size of dealer. Thus, even if all of the six firms in Group II (see Table 12.24) were amalgamated or merged with the four firms in Group I, the total sales of the latter group would only increase by 35 per cent. In fact, the sales in constant dollars of Group I increased by twice this amount between 1961 and 1966 simply from the normal expansion of the market. An amalgamation of the type suggested would undoubtedly result in a major consolidation of dealers such as occurred for Cockshutt and Oliver dealers after the two firms were taken over by the White Motor Company in the early sixties, with a resulting increase in average dealer size. However, as has been suggested above, a good deal of this dealer consolidation can and may occur within companies, and this is not dependent on a reduction in the number of competing companies.

### **The Role of Co-operatives in the Distribution of Farm Machinery**

Co-operatives now are a significant factor in the distribution of farm machinery in two parts of Canada, Quebec and Western Canada. In Quebec the Coopérative Fédérée de Québec distributes farm machinery throughout the province, selling mainly through local co-operatives. In 1965 it supplied about 10 per cent of all farm machinery and parts sold in Quebec. The Coopérative Fédérée sells a wide range of farm supplies to its members, and farm machinery accounts for only about 3 per cent of this total—in 1966, some \$4.7 million. In Western Canada, C.C.I.L., whose competitive role has already been outlined, currently sells about \$20 million of farm machinery and parts, of which somewhat over half is manufactured in its own factory. It is one of the few co-ops anywhere in the world that both manufactures and sells farm machinery.

The decision to establish a co-operative for the production and distribution of farm machinery was a direct result of a recommendation contained in the Report of the Special Committee on Farm Implement Prices, House of Commons, 1937. They had expressed the view that "there is competition in the matter of sales with little effective competition in the matter of prices" and that "the cost of distribution of farm implements is unnecessarily high". They suggested that "farmers should be encouraged to organize for the co-operative distribution and servicing of farm

implements". The initial response to the proposed co-operative was disheartening. In the first membership drive only \$50,000 was raised. However, after several subsequent drives, an amount in excess of \$750,000 was obtained.

The proposed co-operative faced formidable difficulties. At the end of the Second World War, farm machinery was in short supply throughout the world, and existing North American companies were reluctant to supply equipment to this new competitor. Moreover, to begin manufacturing a complete line of equipment from scratch was no easy task. As a result there was considerable doubt in the minds of the directors of the new organization as to the correct course to pursue. Two related developments provided a solution to C.C.I.L.'s problem. The Cockshutt company was contemplating the production for the first time of a tractor and a self-propelled combine. At the same time 12 large co-operative wholesale firms in the United States had joined together to form the National Farm Machinery Co-operative with a view to manufacturing a line of farm machinery. Although Cockshutt was reluctant to supply C.C.I.L. with farm equipment that could be sold in competition with their own dealers, they agreed to do so when C.C.I.L. was able to persuade National to distribute Cockshutt tractors and combines (under the Co-op brand name) in the United States. This additional volume was needed to help ensure the success of Cockshutt's new venture. However, to protect its own dealers, Cockshutt initially allowed C.C.I.L. a discount of only 24.6 per cent off list price instead of the 40 per cent that is more usual for a distributor.

Alternatives that were considered at that time included the outright purchase of Cockshutt either by C.C.I.L. and National jointly, or by C.C.I.L. alone but with an agreement by National to purchase part of Cockshutt's output. One disadvantage of both of these proposals was the fact that Cockshutt had fairly large sales in Eastern Canada and there was no co-operative organization in that area prepared to assume responsibility for these sales. In the event, it was fortunate that C.C.I.L. did not enter into an agreement with National, since the latter failed in 1952, with a loss of over \$3 million, and the 12 wholesale co-operatives who had sponsored it gradually discontinued their farm machinery business, the last one dropping out in 1962.

In the meantime, C.C.I.L. had purchased a small farm machinery factory in Winnipeg and began to manufacture some machines of its own. These included a number of new machines development of which C.C.I.L. pioneered, such as the "disk", the "harrow" and a folding harrow drawbar. In subsequent years, other implements were added to its line and it now manufactures a fairly extensive line of equipment except for tractors, including finishing off self-propelled Volvo (Bolinder-Munktell) combines and the manufacture of a PTO combine built around the Volvo threshing body.

Some years later, in 1962, when the White Motor Company acquired control of Cockshutt and stopped supplying equipment to C.C.I.L., the latter was able to supplement equipment of its own manufacture by importing combines, tractors, and other farm equipment from Western Europe. Improvements in handling these

machines and loading them on board ship, together with the reduction in transport costs as a result of the completion of the St. Lawrence Seaway, helped facilitate this shift to a European source of supplies. In addition, the advent of jet aircraft has made possible the prompt delivery of emergency parts. Mr. John B. Brown, until recently the President of C.C.I.L., reported that emergency parts ordered from West Germany are delivered in Winnipeg the next day, as quickly as they ever were from Cockshutt in Brantford.

One of the objectives of the original founders of C.C.I.L. was a reduction in the costs of distributing farm machinery. To achieve this goal they early decided to confine their distribution network to a limited number of strategically placed depots. By 1952, some 22 depots were in operation. After a pause during the low sales and profit years after 1953, the depot organization was gradually expanded, reaching its present level of 60 depots in 1966. These depots, located in larger trading centres, provide sales and service, maintain a stock of parts, and recondition used machinery. In some ways these depots are comparable to the stores maintained in some centres by major companies. As such, they are admittedly less efficient than the independent dealer with a comparable trading area. In part, this reflects the fact that an individual in business for himself will work harder and longer hours than a salaried employee. In part too, with salaried employees, trade-in losses may be difficult to control. Average sales per depot for new equipment and parts are now about \$300,000.

The depot system has provided assurance of good service and parts supply. It has frequently provided stand-by machines, often used machines, in case of machine breakdowns in critical periods. The system has also facilitated the movement of second-hand equipment from the southern half of the Prairies to more northern areas where farms are smaller, and demand for second-hand machines is larger. Nevertheless, it has apparently not reduced distribution costs as much as had originally been anticipated. The Co-op has discovered that it has had to sell and promote its machines in much the same way as the privately owned companies.

In establishing list prices for its machines, C.C.I.L. has largely followed the practice of the trade and has priced its products at levels very close to those of competitive models, after appropriate allowance for special features or qualities of the various makes. Initially, when it was distributing Cockshutt machines it was required by its agreement with that company to adhere to the list prices announced by Cockshutt. In the early postwar years when equipment was scarce, list prices were generally adhered to and any trade-ins that were accepted were sold readily, often at a premium. However, after sales fell off sharply in the mid-fifties, the practice of over-allowing on trade-ins became general. In 1966 C.C.I.L. reported losses on trade-ins amounting to about 23 per cent of their gross sales of new equipment. Mr. Brown expressed the belief that this was larger than was general in the farm machinery trade.

For the 1968 selling season, C.C.I.L. adopted a new pricing policy. This was reported in their submission to the Commission as follows:

... From now forward all our price lists will contain two prices for every machine. One, the "list price", will be in accordance with present pricing practice of the major machine companies, the other will be the "cash price". ... In sales in which trades are accepted in part payment both the above prices will be stated and also the estimated market value of the trade, and this, plus the costs of handling and selling the trade will be deducted from the "cash" price.<sup>12</sup>

The surplus earned by C.C.I.L. has been distributed to its members, partly in the form of cash dividends, partly in the form of additional shares. Since 1952 no cash dividends have been paid. However, beginning in 1962 members have been allowed to use the shares they have been allotted as part payment for new machines, within limits. Since 1958, savings have averaged over 10 per cent of list prices or around 14 per cent of prices actually paid. More than \$3 million of share dividends have been applied to the purchase of new equipment. From C.C.I.L.'s viewpoint, payment of dividends in the form of shares allows the co-operative to accumulate additional capital. By October 1966, members' equity had risen to \$11.4 million, and this has gone a long way to help finance the large inventory and other capital investment required in this industry. C.C.I.L.'s total inventory in October 1966 amounted to just over \$13 million. From the members' viewpoint, the share dividends are less rewarding, since the shares yield no interest return, and if they are to be redeemed only at some future date, they must bear a heavy discount. Thus a significant part of the savings (profits) reported by C.C.I.L. should be considered a return on the capital invested in the business. If a return of 6 per cent were imputed on members' equity over the 20-year period from 1946-66, it would account for about one-third of total reported savings.

While not a major competitive factor in the western farm machinery market, C.C.I.L. is still a significant influence. Up until 1960 its annual sales were from 2.5 to 3.5 per cent of the Prairie total. However, as a result of a rapid expansion of sales during the past few years it now supplies from 5 to 6 per cent of this market. This increased market share may well reflect the completion of C.C.I.L.'s depot network. The Co-op pioneered in the movement towards fewer and larger distribution depots, a pattern that now is becoming more general in the industry. It took the lead in the development of several important new machines, although as a whole the research and development side of its operations appears relatively weak. It has also provided an opportunity for well-established European manufacturers of tractors and combines to enter the Canadian market. All this has been accomplished with relatively little help from the other large well-established co-operatives. In view of the frequent failures that co-operatives have experienced in the farm machinery business, C.C.I.L.'s success is a creditable achievement.

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<sup>12</sup>C.C.I.L., *Brief to the Royal Commission on Farm Machinery*, Ottawa, December 13, 1967.

Recently, C.C.I.L. has introduced, on an experimental basis, a plan providing for large discounts on cash sales without trade-ins. The plan also offers additional discounts where orders are placed in advance. The discount ranges from 30 per cent for a cash sale, with immediate delivery, to 42 per cent for a cash sale, with delivery 12 months later. The discount rises one percentage point for each additional month's advance notice given. Individual members must sell their own potential trade-ins but may do so at periodic auctions held by C.C.I.L.

Turning now to the experience of the Coopérative Fédérée de Québec, a somewhat different pattern is evident. Coopérative Fédérée has long had a franchise for the distribution of Oliver products in Quebec. In addition, since 1960 it has been selling Renault tractors. It also distributes a variety of hay, potato, irrigation, and other equipment for a number of short-line companies. About 70 per cent of its total purchases of farm machinery is supplied by Oliver.

Coopérative Fédérée in turn distributes its machinery primarily through local co-operatives, although it makes a few sales directly to farmers, and about one-fourth of its sales are through local dealers who are not co-operatives. It now has about 100 licensed dealers, but many of these sell only a small amount of machinery. In 1967, almost half of these purchased equipment valued at \$40,000 or less, and only about 9 per cent made purchases in excess of \$100,000. The local co-operatives are controlled by their own members and are largely independent of the Coopérative Fédérée. This distribution pattern follows closely the one that C.C.I.L. first contemplated but rejected in favour of the depot system.

Although the Coopérative Fédérée supplies about 10 per cent of all the farm equipment sold in Quebec, and its total sales have more than doubled in the past ten years, this has not been a profitable business for it. Only in 1965 and 1966 did it show a net profit, and even then, profits were relatively small—\$39,000 in 1965 and about \$105,000 in 1966. Although its share of the Quebec market has been larger than that of C.C.I.L. on the Prairies, the business as a whole has clearly been much less profitable. Part of this may reflect the profits that accrue to C.C.I.L. on the manufacturing end of its business. However, in part, too, it may reflect the economies that C.C.I.L. gains from its more rationalized distribution network. Then, too, for Coopérative Fédérée, sales of farm machinery are only a small part of a large wholesale business covering many types of farm supplies.

On the evidence available it is far from clear just how much the co-operative distribution of farm machinery in Quebec affects the pattern of competition. In the absence of the Coopérative Fédérée, its major supplier, the Oliver Corporation, would undoubtedly have its own network of dealers. On the other hand, as a distributor of Renault tractors and other short-line products, Coopérative Fédérée undoubtedly facilitates the entry of these products into the Quebec market. Thus its presence adds something to the level of competition and provides a potential for further competition. As such, it should be encouraged to maintain an active role in the distribution of farm machinery.



## **Chapter 11**

### **RETAIL AND WHOLESALE FINANCE**

During the postwar period all the major farm machinery firms have become increasingly involved in the finance of farm machinery at the retail or wholesale levels or both. Wholesale finance is defined as the finance of new machines, attachments, and parts, in the hands of the dealer. Retail finance is defined as the finance of sales to the final consumer. Each of these will be discussed in turn.

In this chapter, finance will be considered as a cost and competitive factor in the industry. The problem faced by the farmer in financing his purchases of machinery will be examined in a later chapter.

#### **Wholesale Finance**

Before the farm machinery companies changed from the agency to the dealership basis of operation in the early or mid-forties, the companies typically shipped new machines and parts to their agents on consignment, with the company retaining ownership of the machines and parts until they were sold. In this period, many of the machines were stored in regional branch warehouses and were shipped to their final destination only after the sale was completed. When the agent became an independent dealer, new machines and parts were sold to him by the company on fairly short terms and he had to assume responsibility for financing his inventory of machines and his parts supply. In addition, he had to finance shop facilities, service tools, and transport equipment. At the time the transition to this new arrangement occurred, the problem of financing the dealer's inventory created no serious problems because machinery was in short supply, and new stock did not remain for long on the dealer's premises. In addition, trade-ins (if there were any) could be readily resold because of the general shortage of machinery.

By the early fifties, the general shortage of farm machinery—a legacy of the war and the Great Depression—had disappeared, and sales of machinery slumped sharply. In the much more competitive market that developed at the dealer level, many dealers began to experience difficulty in financing their inventory, and tried to economize by stocking fewer machines. The farm machinery manufacturers were unhappy about this development. New machinery was typically produced well in

advance of the date of its final sale, and each manufacturer felt that unless its machines were kept constantly in view at the dealer level, it would lose sales to competitors whose machines were on view. Moreover, one major manufacturer, John Deere, had continued to ship its machines to its dealers on a consignment basis in Canada, and the other companies undoubtedly felt that this placed their dealers at a competitive disadvantage.

As a result, all the major full-line and long-line firms introduced the practice of floor-planning new machines and attachments in the hands of the dealer on an interest-free basis. Under these arrangements, new machines would be provided to the dealer free of interest for periods up to 23 months or until the date of sale. Generally limited to machines and attachments with an invoice price in excess of \$100, floor-planning arrangements were later extended to second-hand machinery taken in trade. Deferred credit terms were also provided on dealer purchases of parts under special arrangements designed to encourage the dealer to order parts well in advance of the season of use and maintain an adequate stock to service his customers.

Under free floor-planning arrangements, the dealer is typically obligated to the company under a one-year interest-free lien note. For tractors, the note normally matures one year from date of shipment. For other machines, the note becomes due 12 months following the end of the established season of use. Thus, on a combine, whose established season of use is defined by the company as June 1 to September 30, payment would not become due on a shipment received in October until 12 months after the following September 30; in effect giving the dealer up to 23 months in which to dispose of the machine before he was obligated to pay interest to the company. While dealers would not normally order new machines that far in advance of their normal season of use, the effect of the plan is to provide the dealers with two selling seasons in which to dispose of the machines. It is clear that floor-planning arrangements provide the dealer with more incentive to stock machines on his premises since the company finances this part of his business. Other things taken as equal, this undoubtedly gives the dealer a sales advantage because his machines are on view and the farmer can obtain immediate delivery. Immediate availability is also an advantage to the farmer, who may wish to defer a purchase decision until just before the machine is needed. Since the time any machine is replaced can be varied within rather broad limits, he retains the freedom to make his old machine last another year if the crop or market outlook is adverse by deferring his purchase decision until the season of use. However, machines stored on the dealer's premises or elsewhere may deteriorate to some degree before they are finally sold.

Floor-planning arrangements also undoubtedly add something to the cost of machinery and to the price eventually paid by the farmer. In its submission to the Commission, Massey-Ferguson claimed that floor-planning was provided at substantial cost to the company. However, when they were asked to explain the difference

between prices of tractors in Britain and Canada, the cost of floor-planning was cited as one of the reasons for the higher price of tractors in Canada—in effect, stating that the cost was passed on to the customer. According to their estimate, on one of their MF 135 tractors, the cost of floor-planning amounted in 1967 to \$195, or about 5.5 per cent of the suggested retail price. This estimate includes the cost of floor-planning on both the new tractor and the used tractor taken in trade, and is based on their experience that—on the average—a new tractor in Canada is floor-planned for six months. It also includes the cost of insurance on the floor-plan. Ford estimated the cost of financing its inventory of new and used goods in the hands of dealers at around 7 per cent of the value of sales at the suggested list price. International Harvester estimated that tractors imported from Britain were floor-planned in the hands of the dealer for an average of nine to ten months. The company attributed this, in part, to the fact that a substantial number had to be brought in by ship before freeze-up in the fall because tractors delivered in the spring might not reach the dealer's premises in time for the spring marketing season. Since floor-planning on other machines may extend over a period of 23 months, whereas the maximum for tractors is 12 months, this additional cost for such machines may at times be higher than for tractors. However, dealer operating statements suggest that year-end inventories of new machines are the equivalent of about four months of sales. Since inventory levels are probably low at the year-end, the average amount held in inventory may well be higher than this—perhaps in the order of five or six months of sales. In brief, it appears that floor-planning costs vary from 5 to 7 per cent of the suggested retail price of farm machinery.

Some part of these costs are undoubtedly an inevitable component of the cost of supplying farm machinery to farmers. Given the marked seasonal pattern that characterizes the sale of most machines (a pattern that results from the farmer's predisposition to defer his purchase to the last possible moment) and given the necessity that the companies find of producing machinery well in advance of sale (in order to be able to meet anticipated demand and yet keep their production costs down by producing in sufficient volume to attain reasonable economies of scale), there will be a cost of carrying this inventory from the date of production until it is finally sold to the farmer. By including these costs in the price to the dealer and providing interest-free floor-planning arrangements, dealers are given an incentive to carry larger inventories. But the dealer has little incentive to economize on the use of inventory except to the extent that larger inventory may carry a risk of loss through obsolescence. To the degree that the dealer is induced to carry larger inventories than he would if he had to absorb the interest cost, something may be added to the over-all cost of doing business. Dealer inventory turnover over the past 15 years has tended to decline in years of rising sales and increase when sales slump (see Table 10.7).

British farmers and distributors are apparently able almost completely to avoid interest-free floor-planning costs on tractors because a farmer typically orders his tractor from the factory and the dealer delivers it as soon as it arrives. The

existence of large factories producing tractors for a worldwide market undoubtedly facilitates this arrangement. However, there would appear to be no reason why the farm machinery companies supplying tractors from Europe should not offer to order tractors from the factory for Canadian farmers at a price that is reduced by the amount of normal floor-planning costs. Whether many farmers would take advantage of this arrangement is open to question. Nevertheless, I would recommend that the companies should experiment with some such plan. There would appear to be less scope for a similar arrangement for tractors produced in North America, since sales of these larger tractors are concentrated in North America and are highly seasonal. To achieve reasonable economies of scale, firms must produce tractors on a year-round basis, thus making almost inevitable an accumulation of inventory during the slack sales season. A similar conclusion applies to many of the other machines produced and sold in North America.

### Retail Finance

Prior to the Second World War, the banks and the farm machinery companies were the major sources of credit for the finance of farm machinery. Because of their serious bad-debt losses and collection difficulties in the 1930s, the farm machinery companies partly withdrew from the finance business and have only gradually returned to it. The decision to withdraw was facilitated by the fact that at the end of the war many farmers had ample liquid funds in the form of cash or savings bonds. In addition, the introduction of the *Farm Improvement Loans Act* (F.I.L.A.) in 1944 provided farmers with an alternative source of finance at a much lower cost.

Under this Act, the government provided a guarantee against losses of up to 10 per cent of the value of loans made under the Act. In its original form, the only institutions eligible for this guarantee were the chartered banks. Loans to each farmer were limited to \$3,000; the interest rate was limited to a maximum of 5 per cent per year simple interest; and loans on farm implements were limited to a maximum term of three years and to no more than 75 per cent of the cash price of the implement. The legislation proved very successful, and within a few years of its introduction, loans under the Act for the finance of farm machinery were running at a level around one-third of the wholesale value of new farm machinery sales. (Because some of these loans were used to finance second-hand machinery, the percentage of the value of new machines financed under the Act would be lower than this.) From 1945-67 about 80 per cent of loans made under the Act were for farm implements.

In the ensuing years, the Act was revised to raise the loan limits for individual farmers to \$4,000 in 1953, \$5,000 in 1956, to \$7,500 in 1959, and to \$15,000 in 1964. Although there have been periodic complaints that the loan limits had been set too low, a Department of Finance survey indicated that in 1967 only 6 per cent of the loans were for amounts in excess of \$5,000 and that there had only been one loan in excess of \$10,000. Although individual machines may be priced at \$15,000

or more, the farmer typically trades in older machines so the net balance owing is usually well below the cash price. Even in 1967, the average size of loan was only \$2,600.

To some degree, the absence of larger loans may reflect a conflict between normal banking practice and the guidelines for the term of lending given in the regulations to the Act. These regulations suggest the following pattern:

<u>Approximate Amount of Loan</u>	<u>Normal Repayment Period</u>
\$ 1,000	2 years, 6 months
2,500	4 years
5,000	6 years, 6 months
7,500	8 years
10,000	8 years, 6 months
15,000	10 years

Sound finance practice would consider that the term of the loan should be related to the life of the asset rather than the size of the loan. However, the longer term suggested for the larger loans would undoubtedly make it easier for the young farmers to make major machinery acquisitions.

The most recent amendments to the Act replaced the 5 per cent interest-rate ceiling with a regulated rate, established an over-all maximum loan limit of \$25,000 but retained the \$15,000 limit on loans for the purchase of farm machinery, and extended the range of lenders eligible for the guarantee to include loan, trust, and insurance companies, credit unions, and caisses populaires. Prior to the removal of the interest-rate ceiling, there had been some decline in bank lending under the Act as rising interest-rate levels made these loans relatively unattractive to the banks. With the removal of the ceiling, the banks as well as the other institutions that have recently become eligible for the government's guarantee will have more incentive to compete actively for the finance business involved in the sale of farm machinery. Over the past decade, F.I.L.A. loans have amounted to between 3 and 4 per cent of the chartered banks' general loans, suggesting that the banks could very easily make additional funds available in this area if they wished.

Although no exact figures are available on the extent to which the sale of new farm machinery is financed by the farm machinery companies themselves, there is evidence that this has increased substantially in importance in recent years. One estimate prepared for the Commission suggests that about 60 per cent of the value of new farm machinery sales were financed by credit in 1963.<sup>1</sup> Of this total, it was estimated that the chartered banks financed about one-half, the farm machinery companies 16 per cent, finance companies 12 per cent, and all other sources about 20 per cent. However, other evidence suggests that this estimate of machinery-company finance may be low. John Deere reported that in recent years it has financed from 40 to 45 per cent of all its retail sales, New Holland reported that it

<sup>1</sup> R. Harris, *Farm Machinery Finance*, unpublished Commission study, 1969.

had financed 44 per cent of its retail sales in the 1966 crop year, Allis-Chalmers reported that it financed 15 per cent of its sales in 1964 and 31 per cent in 1966, and Case reported financing 35 per cent of its Canadian dealer sales in 1966. Massey-Ferguson said that in 1966, acceptance of time-payment contracts amounted to 47 per cent of sales in Canada and 37 per cent in the United States. In 1960, only 20 per cent of Massey-Ferguson's Canadian sales had been financed by the company. These totals apparently include credit extended under interest-free arrangements, even though the amount owing may be settled in full at the end of the interest-free period. Thus these data may overestimate the amount of credit extended for which a formal charge is being made.

The reason for this increase in the importance of machinery company finance is not entirely clear since F.I.L.A. loans provide a much lower-cost alternative. In terms of simple interest, most companies charge from 13 to 15 per cent per year, much more than the F.I.L.A. rate, which during the summer of 1969 was set at 7  $\frac{3}{4}$  per cent. To some extent, the relatively heavy use of machine-company finance must reflect the fact that the machinery companies find the provision of credit profitable and their dealers encourage customers to use it. In contrast, in the period just before the interest ceiling was removed, the chartered banks undoubtedly made little effort to sell farmers on the merits of F.I.L.A. loans. Some companies also report that a finance plan enables them to maintain and develop more accurate statistics of market trends and movements.

Increased competition in finance is reflected in the development of interest-free finance plans. The out-of-season form of this plan apparently originated in 1958 on the Prairies when one company found itself with a heavy carryover of combines in dealer hands and offered to sell these to farmers on an interest-free basis until just prior to the next season of use. The practice was continued and soon became general in the industry. Out-of-season sales are of significant advantage to both the dealer and the manufacturer. They provide the dealer with more time to adjust and check new machines prior to delivery. And the machines taken in trade can be reconditioned during the slack season and made ready for resale. For the manufacturer, it provides a reduced risk because machines have to be produced well in advance of sale in any case. The farmer may gain an advantage in the form of a better deal on his trade-in. He is also protected from interim price increases. It can be argued that the plan often costs the machinery companies virtually nothing, because the machines would have been floor-planned in the dealers' hand in any case.

Although the interest-free plans were at first applied only to sales in the off-season, they were later extended to in-season sales as well. Thus a farmer might buy a combine in August but would not be required to pay interest until a year later. In addition, he would receive interest on his cash down payment. This type of plan is apparently not used by all companies or by any one company on all its machines or in all years. It appears to be basically a sales-promotion device. In some respects, it amounts to a form of reduction from the list price, the amount of the

reduction being equal to the cost of funds to the company, perhaps 7 or 8 per cent per year. The over-all extent to which the plan is used is not known. One company reported that at the end of 1966, 40 per cent of its retail notes outstanding were on an interest-free basis, although this presumably includes both in-season and out-of-season plans. This compared with 30 per cent in the United States. The greater use of the plan in Canada may reflect the higher degree of seasonality here. To the degree that the plan becomes general, the cost may well be built into the price of machinery. However, when used sporadically, interest-free in-season finance probably represents a genuine price reduction to those who take advantage of the plan.

One company reported to the Commission privately that the in-season interest-free plan was adding very significantly to the cost of farm machinery. It induces farmers to defer trading in their combines and other machines until near the season of use to obtain the advantage of this plan. As a result, dealers are not able to recondition the trade-in for sale during the same season. Thus it results in traded-in machines sitting on dealer lots for an additional year, thus adding substantially to total costs.

The in-season plan appears to serve no useful purpose and it is recommended that its use be banned. The companies that wish to provide additional incentives for the purchase of their machines during the season of use can do so by outright price reductions.

To some degree, the development of interest-free finance plans may have discouraged the use of F.I.L.A. loans. If the farmer makes his arrangements at the date of the original sales agreement, it is possible to finance by means of a F.I.L.A. loan when the interest-free period ends. However, F.I.L.A. requirements do not allow the use of a guaranteed loan for refinancing purposes. If the farmer waits until the end of the interest-free period before applying for a F.I.L.A. loan, he is technically not eligible. Still, many farmers apparently secure bank finance under the Act at the end of the interest-free period. It would be desirable to regularize practice here, and it is therefore recommended that F.I.L.A. financing be made available at the end of the interest-free period granted by the farm machinery company.

### **Finance Subsidiaries**

Many of the farm machinery companies have set up credit subsidiaries to handle their finance business. This enables them to borrow from banks or other financial institutions on the security of the retail or wholesale paper they write. Since the credit subsidiaries can be operated with relatively low ratios of equity to total assets—typically 12 to 14 per cent—and with a larger proportion of short-term credit, it undoubtedly enables the companies to obtain funds for finance purposes at a lower over-all cost. Many of the companies established their credit subsidiaries between 1955 and 1962. The effects of these finance subsidiaries on the companies'

over-all balance sheet and profit position is discussed in Chapter 12. This section of the Report examines the profitability of the subsidiaries as such.

Accurate measurement of the income earned by the companies on their finance business is made difficult by the fact that there are various methods of allocating the periodic payments made on finance contracts between interest and principal repayment. Different methods can give different time patterns of income over the life of a note. In addition, in periods when the companies' finance business is rapidly expanding or declining, reported earnings may understate or overstate their true return. In the former case, company balance sheets would include a substantial proportion of notes on which the first interest payment would not be made until the following year. The increasing prevalence of interest-free periods in the early months of any retail note tends to accentuate this problem. For example, in 1965, interest revenues on retail notes, expressed as a percentage of average year-end balances of retail accounts receivable, were as follows: Deere 7.3 per cent, Massey-Ferguson 9.8 per cent, International Harvester 8.7 per cent, and Case 5.5 per cent. The interest revenues reported are gross data before the deductions of operating expenses, although they may be net of dealer commissions (which one company has reported as 10 per cent of the gross finance charge). Since most companies charge the farmer interest at the rate of 13 to 15 per cent, it is clear that the returns reported above contain a substantial element of under-statement.

The profitability of finance subsidiaries is also affected by various parent-subsidiary charges. Two main types of charge are important. The parent company often charges the finance subsidiary for certain administrative services rendered on its behalf. In addition, the parent company makes a payment to the subsidiary to provide an interest return on certain interest-free dealer notes that the parent takes as part of its dealer floor-planning arrangement. The way losses on notes are shared further complicates the picture. The first charge arises because the various operations involved in finance, credit investigations, billing, and collections, are generally carried on partially or totally by parent-company personnel using parent-company facilities. The exact amount charged to the subsidiary is a matter of judgement, and is to some degree arbitrary. Where published information is available, it suggests that the amount of these charges in relation to total revenues are substantial and vary widely from one company to another. Company reports also indicate substantial variation in the ratio of interest revenues on wholesale notes to the amount of these notes outstanding.

Nevertheless, published information indicates that the finance business of the farm machinery companies is highly profitable. Data for five major companies for 1965 are given in Table 11.1. As these data show, before-tax profits earned by these companies on their finance business range from 32 to 40 per cent of their total revenues. It is clear that the profitability of this business is such that the companies have a strong interest in selling their finance plans to their farmer customers.



TABLE 11.1—INCOME STATEMENTS OF FINANCE SUBSIDIARIES OF FIVE MAJOR FARM MACHINERY FIRMS, 1965

	(Percentage of total revenues)				
	Deere	Massey-Ferguson	International Harvester	Case	White Motor
Interest revenues	100.0	100.0	100.0	100.0	100.0
Interest expense	46.5	34.4	41.2	51.0	57.4
Other expenses	18.1	31.3	20.2	9.0	10.3
Profit before taxes	35.4	34.3	38.6	40.0	32.3
Income taxes	17.1	16.9	19.7	18.6	15.8
Net income	18.3	17.4	18.9	21.4	16.5
Charges by affiliates for administration services included in "other expenses" above	n.a. <sup>1</sup>	30.0	14.8	n.a. <sup>2</sup>	8.6

<sup>1</sup> Compensation to Deere & Co. for administrative services in connection with handling retail notes on behalf of the Deere finance subsidiary is achieved by way of a deduction from the face value of notes by the parent. This deduction is taken into income by the parent as the notes mature. This method of compensating the parent company for administrative services is not readily comparable with that used by the other companies above.

<sup>2</sup> This figure will be under 9.0 per cent since the total of "other expenses" is 9.0 per cent.

Source: D. Martinusen and B. P. Barry, *Revenues, Costs and Profits in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 11 (Ottawa: Information Canada, 1970), Table 8.6.

Besides being profitable, the provision of wholesale and retail finance by the full-line and long-line companies is also an important competitive factor in the industry. Floor-planning on an interest-free basis ensures that the company's products will be on view at dealer locations close to where the customer lives. It also makes the dealer highly dependent on the company whose franchise he holds, and undoubtedly makes him less willing to carry competitive products of short-line firms. The short-line firms typically sell their products to the dealer on fairly short terms. The dealer in turn may often finance this inventory through the banks or finance companies. If the dealer's financial position were stronger, he would be able to exercise more independence with a beneficial effect on competition in the industry generally.

Accordingly, the Commission recommends that the government introduce a guaranteed loan program for dealers similar in form to the F.I.L.A. This would encourage the banks and other financial institutions to make loans to dealers, thus strengthening the dealers' financial position. It would probably be desirable to limit the granting of guaranteed loans to dealers who had reached a reasonably efficient size—say, annual sales of not less than \$200,000—or who showed promise of reaching such a size within a few years.

In view of the advantages that interest-free floor-planning arrangements give to the large company, it is recommended that the government make the floor-planning of new farm machines in the hands of dealers on an interest-free

basis illegal. To be effective, such a ban on free floor-planning arrangements would have to be accompanied by the elimination of consignment selling to dealers and provisions for minimum interest rates on the sale of new machines to dealers on a credit basis. The interest-free floor-planning of second-hand farm machinery should also be made illegal.

Rather than impose an outright ban on free floor-planning immediately, it would be desirable first to impose some limitation on its use. Initially, interest-free floor-planning might be limited to not more than six months on each transaction for tractors and to not more than one year for all other machines. This time limit might conveniently run from the date machines are shipped from the branch-house to the dealer. For second-hand machinery, a three-month limit might be imposed. After this limitation was in effect for a year or two its impact at the dealer level could be reassessed before proceeding with an outright ban.

If this proposal took effect at the same time as the proposed program of guaranteed loans to farm machinery dealers, it should avoid any undue hardship on dealers. Reasonable notice should be given of the introduction of these restrictions to enable dealers to reduce existing commitments. No restrictions should be placed on lenient or deferred credit terms for dealer purchases of parts.

The over-all effect of these proposals to restrict the use of interest-free floor-planning should be to make it easier for new or short-line manufacturers to establish themselves in competition with the larger full-line or long-line companies. It should also encourage more economy in the use of farm machinery inventory, and thus reduce the rather major cost to the farmer involved in interest-free floor-planning. Indeed, the companies themselves might welcome some limitation. When free floor-planning was first introduced, interest-rate levels were comparatively low. As market levels of interest rates have risen, this cost has steadily increased. It now adds significantly to the cost of distribution of farm machinery in North America.

With the elimination of interest-free floor-planning the farm machinery companies should be able to reduce their dealer prices to some degree because they would no longer have to finance wholegoods inventory in the hands of the dealer. A partial offset to this saving would be the additional inventory they might find it necessary to carry at the wholesale level.

On the retail side, it is clear that the F.I.L.A. not only makes it easier for the farmer to finance his purchases of machinery but also helps maintain a more competitive market structure for farm machinery. The loans available under this Act make it easier for the short-line manufacturers and the long-line firms without a finance plan to compete with the full-line firms. However, the rapid growth in finance under machinery-company plans during recent years suggests that F.I.L.A. loans have been less competitive than they were in earlier years. In part, this may have been due to the fact that the banks had little incentive to promote these loans when the 5 per cent interest-rate ceiling made the business unattractive to them.

With the higher rates now in effect, there may be some revival in F.I.L.A. lending, but it is too soon to tell. The decline in F.I.L.A. finance also reflects the fact that this is profitable business to the farm machinery companies: they sell it aggressively and their dealers have a financial interest in selling their company's finance plan. For example, under Massey-Ferguson's finance plan, the dealer receives 10 per cent of the gross interest charges, which would be something in the order of 1.3 to 1.5 per cent on the credit extended. Recently, a number of provinces have enacted legislation requiring all contracts involving time payments to state in terms of simple interest the interest rate charged under the contract. It is the Commission's understanding that some of this legislation covers contracts involving the sale of farm machinery. However, it would be highly desirable for all provinces to pass legislation requiring this provision for all credit issued in the purchase of farm machinery. This would forcibly draw the farmer's attention to the higher interest rate charged by the farm machinery and finance companies, compared with the F.I.L.A. rate. It would also be important to specify in this legislation that the simple interest rate to be calculated under this legislation should exclude any interest-free period so the rate would not be artificially low. The various farm organizations could do their members a service by drawing to their attention the advantage of F.I.L.A. financing. In any future revisions of the Act, particular attention should be paid to the implications of any change for the level and degree of competition that exist in the farm machinery industry.

It is also recommended that the maximum term for farm-implement lending under F.I.L.A. be lengthened by at least two years. If further control is desired, loans could be classified according to the type of implement financed rather than by the size of the loans. Lenders would, of course, be free to use their judgement to lend for shorter than the maximum periods. In addition, in order to increase the flexibility of farm machinery loans and to increase their attractiveness for intermediate-term use, consideration might be given to a "two-step" interest-rate plan. Under this arrangement the interest rate charged on a loan would automatically be adjusted at the end of three years to the rate indicated by the interest-rate formula at that time. This would mean that the yield on the loan would be updated to current terms and would introduce, with a minimum of administrative complexity, one aspect of a second shorter-term loan from the lender's point of view. Finally, in view of the importance of farm machinery finance, it is recommended that some governmental authority, perhaps the Bank of Canada, should undertake to collect and publish data annually on all significant sources of funds. These data might well include the amount of farm machinery credit extended during the year, the amount outstanding at the end of the year, the proportion of credit extended for new and old machinery, duration of loans made, normal down-payment required and interest rates charged, size of loans granted, and bad debt experience.

## Chapter 12

### PROFITS

The profits earned by the farm machinery industry may provide an indication of the degree of monopoly existing in the industry. High profits over an extended period would be clear evidence of monopoly pricing and the existence of an effective barrier to the entry of new firms. But low profits for the industry as a whole need not mean an absence of monopoly pricing. If the dominant firms have significant advantages in the form of economies of scale on major products such as tractors and combines, and prices are high enough to permit them to earn monopoly profits on these products, these same prices may permit smaller high-cost firms to survive, thus keeping the industry's average profit low.

High profits for individual firms may have other explanations. For major firms they may be the result of large R&D expenditures which give these firms a continuing lead in the introduction of new products. Smaller firms may earn high profits by specializing in particular product lines and pioneering new developments in these areas. As the industry has become more international in scope, the profit record of major firms has also become dependent on their international strategy in locating production facilities in low-cost countries, and in developing and managing their production and marketing on a worldwide scale. It is also possible for major firms to earn high profits in manufacturing major products but dilute these profits either through heavy investments in distribution assets or by manufacturing other products on much smaller margins. Nevertheless, persistent high profits are evidence of monopoly. This chapter will first consider the evidence on the profits earned in the industry, and then assess the explanations of this evidence.

In considering the profits earned by farm machinery manufacturers it is important to go beyond Canadian borders and consider profits earned in North America as a whole, and to some degree the profits earned on the worldwide operations of the major companies. About two-thirds of the farm machinery manufactured in Canada is exported. And about 70 per cent of the farm machinery purchased by Canadian farmers is imported, mainly from the United States. Increasingly, too, as is pointed out in Chapter 14, world trade in farm machinery is coming under the dominance of a few major international companies. And as was

demonstrated in the Commission's *Special Report on Prices of Tractors and Combines in Canada and Other Countries*, trade may be regulated so that farmers in Canada do not get the full advantage of low-cost production in other countries. Thus the prices paid by Canadian farmers are highly dependent on the costs and profits of the industry in the United States as well as Canada and on the way the industry conducts its worldwide operations.

The profits earned by this industry in Canada must be viewed as one segment of the profits earned in a continent-wide and to an important degree a worldwide manufacturing and marketing activity. Taken by themselves, these Canadian profits need careful interpretation. Most of the exports on which manufacturing profits are so heavily dependent go to another branch or subsidiary of the same international company. For this reason the prices at which this transfer is made are to some degree arbitrary. Similarly, all the major firms selling farm machinery in Canada import all or most of the machines they sell from the United States or Western Europe. Again, the price they pay for these machines is a transfer price—a price at which the machine is transferred from one division to another division of the same international corporation. These transfer prices, and to an important degree the profits earned in Canada by these firms, are arbitrary. As will be shown later, modest variations in these transfer prices can cause large variations in the profits of the Canadian subsidiary. There are, of course, independent firms that manufacture and sell primarily in Canada. But the Canadian profit picture is dominated by the major international firms.

Evidence on the worldwide profits of the major farm machinery firms will be examined first. Then the data on profits earned by the industry in Canada will be considered.

### **Worldwide Profits of Major Farm Machinery Manufacturers**

This appraisal of the worldwide profits of major international companies has been based on published information for six companies active in the Canadian market—namely, Deere & Company, Massey-Ferguson Limited, International Harvester Company, J. I. Case Company, Allis-Chalmers Manufacturing Company, and the White Motor Corporation. All of these companies are full-line companies, with 25 per cent or more of their worldwide sales consisting of farm machinery. All perform the wholesale function as well as manufacturing most of the products they sell, selling directly to franchised dealers who perform the retail function. All but Case and Allis-Chalmers have a manufacturing operation in Canada. Five of the companies are American-owned with headquarters in the United States. The sixth, Massey-Ferguson Limited, is Canadian-owned with worldwide headquarters in Toronto. The brand names of the machinery sold by these firms are well known to generations of Canadian farmers.

Two other large companies with extensive farm machinery operations, the tractor division of the Ford Motor Company and the New Holland Division of the

Sperry Rand Corporation, were excluded from this survey because their farm machinery activities, though significant in absolute size, represented only a minor part (about 3 per cent and 12 per cent, respectively) of total company sales.

The six companies surveyed vary markedly both in respect to the share of farm machinery in their total sales and in the importance of their North American sales and manufacturing operation in the company's worldwide operation. As Table 12.1 shows, Deere, Massey-Ferguson, and Case are basically farm machinery companies with 55 per cent or more of their total sales provided by farm machinery

TABLE 12.1—WORLDWIDE SALES OF ALL PRODUCTS, FARM MACHINERY SALES, AND NORTH AMERICAN SALES, SIX MAJOR COMPANIES, 1967

	Worldwide Sales		Farm Machinery Sales	North American Sales of All Products
	All Products	Farm Machinery		
	(Millions of U.S. dollars)	(Millions of U.S. dollars)		(As a percentage of total company sales)
Deere	\$1,086	\$931	86	86
Massey-Ferguson	846	659	78	41
Case	345	190	55	89
International Harvester	2,542	801	32	82
Allis-Chalmers	859	231	27	88
White Motor	770	196	25	98

Source: From D. Martinusen and B. P. Barry, *Revenues, Costs and Profits in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 11 (Ottawa: Information Canada, 1970), Tables 2.1 and 2.3.

and a substantial part of their remaining sales made up of light industrial equipment, a product line that is broadly similar to farm machinery. International Harvester, Allis-Chalmers, and White Motor each have an important farm machinery operation but it constitutes only from 25 to 31 per cent of their total sales. International Harvester has a major part of its manufacturing and sales in trucks and heavy construction equipment. White Motor is also a major producer of trucks, and Allis-Chalmers has a widely diversified manufacturing operation which includes mining, construction, electrical, and other machinery. An approximate picture of the six companies' distribution of sales by product line is given in Table 12.2.

With the exception of Massey-Ferguson, all six firms have 80 per cent or more of their worldwide sales in North America. Massey-Ferguson, in 1967, had only 41 per cent of its sales on this continent, 31 per cent in the United States and 10 per cent in Canada. In 1969 this had fallen further to 38 per cent in North America and 8 per cent in Canada. Measured by the book value of net fixed assets, only three firms—Massey-Ferguson, Deere, and International Harvester—have about 20 per cent or more of their manufacturing facilities outside North America. For Deere and International Harvester the share for the most recent year is 21 and 19 per cent

respectively, and for Massey-Ferguson 53 per cent. This latter figure probably understates Massey-Ferguson's activities outside North America, since in 1965 it had 74 per cent of its total employment and 61 per cent of its factory square footage outside this continent. For both Case and Allis-Chalmers, sales outside North America have suffered a relative decline in recent years, Case from 15 per cent of total sales in 1963 to 11 per cent in 1967, and Allis-Chalmers from 20 per cent in 1960 to 12 per cent in 1967.

TABLE 12.2—SALES PERCENTAGES FOR MAJOR PRODUCT LINES,  
SIX MAJOR FARM MACHINERY COMPANIES, 1967

	Deere	Massey-Ferguson	Case	Inter-national Harvester	Allis-Chalmers	White Motor
Farm machinery	86	78 <sup>1</sup>	55	32 <sup>2</sup>	27 <sup>2</sup>	25
Trucks	—	—	—	44	—	44
Light industrial, lawn and garden	14	12	45	5 <sup>2</sup>	6 <sup>2</sup>	—
Heavy earthmoving machinery	—	—	—	13	24 <sup>3</sup>	—
Production equipment	—	—	—	—	27 <sup>4</sup>	11 <sup>5</sup>
Electrical utilities equipment	—	—	—	—	16	—
Engines	—	10	—	—	—	—
Miscellaneous	—	—	—	6	—	20
	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>

<sup>1</sup> Massey-Ferguson's parts sales have been allocated to farm machinery, industrial equipment, and engines. This procedure has not been followed with respect to White Motor because White Motor's parts and service is believed to include the operation of truck service centres.

<sup>2</sup> The division between farm machinery and light industrial, lawn and garden equipment was estimated using Deere's ratio.

<sup>3</sup> Includes iron-ore pelletizing and other processing equipment.

<sup>4</sup> Includes such diverse items as pumps, compressors, motors, paper-machines, small generators, switchgear, lift-trucks, wind-tunnels, and water and air pollution control equipment.

<sup>5</sup> Includes compressors, engines, and fork-lift trucks.

Source: From D. Martinusen and B. P. Barry, *Revenues, Costs and Profits in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 11 (Ottawa: Information Canada, 1970), Table 2.2.

An analysis of the asset holdings and sales of the three major international firms—Massey-Ferguson, International Harvester, and Deere—shows a significant upward trend in the share of Massey-Ferguson's and Deere's total assets located outside North America, and a rather mixed pattern for sales, with Deere's sales outside North America increasing in importance and Massey-Ferguson's and International's declining somewhat over the period. The decline in Massey-Ferguson's sales position outside North America undoubtedly reflects its success in increasing its penetration of the United States market. Sales in the United States, for example, increased from 24 per cent of Massey-Ferguson's total sales in 1962 to 30 per cent in 1969. Some details on these changes are given in Table 12.3.

TABLE 12.3—PERCENTAGE OF COMPANY SALES AND ASSETS  
OUTSIDE NORTH AMERICA, THREE MAJOR FARM  
MACHINERY COMPANIES, SELECTED YEARS, 1957-69

	Deere	Massey- Ferguson	Inter- national Harvester
	Sales of All Products		
1957	12	66	23
1960	13	58	21
1963	11	65	20
1967	14	59	18
1968	17	62	19
1969	18	62	19
	Total Assets		
1957	8	41(1958)	17 <sup>1</sup>
1960	11	48	17
1963	15	55	19
1967	21	51	20
1968	19	51	19
1969	21	53	19

<sup>1</sup>Data for International Harvester are net assets in all years, the equivalent of the company's equity in non-North American subsidiaries; percentage is related to total net assets.

Source: From D. Martinusen and B.P. Barry, *Revenues, Costs and Profits in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 11 (Ottawa: Information Canada, 1970), Table 2.5, and Commission analysis of later *Annual Reports* of companies.

Only fragmentary data are available with respect to the relative profitability of different product lines and regions. This makes it difficult to draw firm conclusions with respect to the profitability of the production and sale of farm machinery in North America. The White Motor Corporation, a newcomer to farm machinery and a company whose sales are almost entirely in North America, reported that "profit margins on sales of farm equipment are generally higher than on sales of trucks and industrial equipment".<sup>1</sup> International Harvester has published some information on earnings by region. The results for the period 1962 to 1967 were as follows:

	Annual Sales Millions of U.S. Dollars	Net Income as Percentage of Sales	Net Income as Percentage of Net Assets
(Averages for 1962-67)			
North America	\$1,800	4.4	9.1
Europe and Africa	247	1.5	3.1
Latin America	68	(0.4)	(0.8)
Pacific area	130	4.1	8.9
World total	2,244	3.9	8.2

<sup>1</sup>Company *Prospectus*, March 12, 1968, p. 7.



These data indicate that earnings in North America were significantly higher than in the rest of the world. Deere has also reported substantial losses in its business outside North America since its decision to enter this market in a substantial way as a manufacturer as well as a seller. In contrast, Massey-Ferguson apparently had net income after tax as percentage of sales in 1966 of about 5.7 per cent outside North America, compared with only 3.9 per cent in North America.<sup>2</sup> This difference between the position of Deere and Massey-Ferguson is consistent with the fact that Massey-Ferguson is already well established outside North America and is trying to increase its share of the United States market whereas the reverse is true of Deere. Both companies may be incurring extra sales' costs and selling at more favourable prices in the markets they are trying to penetrate.

Since profits are often assessed in relation to assets, it is also useful to examine available data with respect to capital expenditures and asset levels. The various indicators in Table 12.4 provide some measure of the level of capital expenditures and the fixed-asset position of the six firms. The data suggest that Deere and Massey-Ferguson have had the highest capital expenditure program in

TABLE 12.4—INDICATORS OF INVESTMENT IN FIXED ASSETS AND CAPITAL EXPENDITURES, SIX MAJOR FARM MACHINERY COMPANIES, VARIOUS PERIODS, 1957-67

	Net Fixed Assets per Employee, Average 1962-67	Capital Expenditures as Percentage of Sales		Capital Expenditures 1963-67 as Percentage of Net Fixed Assets December, 1967	Ratio of Net Sales to Net Fixed Assets, 1963-67
		1957-67	1963-67		
	(\$'000 U.S.)				
Deere	4.8	5.3	6.0	105	4.6
Massey-Ferguson	3.2	5.5	5.4	107	5.0
International Harvester	3.9	3.9	4.0	80	5.0
Case	4.3	3.3	5.3	91	5.0
Allis-Chalmers	3.6	2.0	2.7	90	4.5
White Motor	3.0 <sup>1</sup>	—	1.6	87	15.0

<sup>1</sup> 1967 only.

Source: From D. Martinusen and B. P. Barry, *Revenues, Costs and Profits in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 11 (Ottawa: Information Canada, 1970), Tables 4.6 to 4.9.

relation to sales over the past decade, with average expenditures of 5.3 and 5.5 per cent of sales. Case has had a similar expenditure level in the later five-year period (1963-67). As a result, Deere and Massey-Ferguson currently have the "newest" fixed-asset structure, judged by the ratio of their capital spending in the last five

<sup>2</sup> Data are approximate since they appear in chart form only in E. P. Neufeld, *A Global Corporation*, Toronto, 1969, pp. 166-9.

years to their net fixed assets at the end of 1967. In relation to sales, White Motor and Allis-Chalmers had the lowest level of capital expenditures. Five of the six companies have ratios of sales to net fixed assets within the range of 4.5 and 5.0. The exception is White Motor with the very different ratio of 15.0. This undoubtedly reflects its acquisition of assets at very favourable prices.

A comparison of operating profit ratios (as a percentage of sales) for these six companies over the postwar period shows a marked variation in the profitability of different firms and a general decline in profit ratios. As Table 12.5 shows, for three companies, Massey-Ferguson, Case, and Allis-Chalmers, ratios for the period from 1957-67 varied from 37 to 63 per cent of those achieved in the preceding decade. Deere and International Harvester showed much smaller declines. Deere's operating profit ratio is very much the highest, more than twice as high as for most other firms.

TABLE 12.5—OPERATING PROFITS AS PERCENTAGE OF NET SALES,  
SIX MAJOR FARM MACHINERY COMPANIES,  
1947-56, 1957-67, 1963-67, 1968, and 1969

	Deere	Massey-Ferguson	Case	International Harvester	Allis-Chalmers	White Motor
1947-56	17.4	10.7	10.9	8.8	10.2	n.a.
1957-67	14.8	6.7	4.0	8.2	4.7	n.a.
1963-67	15.3	7.4	7.5	8.2	4.0	7.1
1968	10.1	6.5	6.1	6.1	(10.8)	6.1
1969	10.3	6.1	6.1	5.4	n.a.	4.7

Source: *Annual Reports* of companies and *Moody's Industrial Manual*.

Deere's higher operating-profit ratio reflects almost entirely a lower ratio of cost of goods sold to net sales. Deere's ratio for the period 1957-67 averaged 73.5 per cent, considerably lower than the comparable ratio for any of the other five companies (see Table 12.6). Four of the remaining companies had a ratio within the narrow range of 80 and 81 per cent, and the other company, Allis-Chalmers, had a ratio of 83.6 per cent. Massey-Ferguson's ratio of 80.9 for the period, as a whole, conceals a downward trend from around 88 in 1957 and 83 in 1958 to about 77 per cent in recent years. Deere is the only one of the six companies whose sales not only are predominantly farm machinery, but also are mainly in Canada and the United States. Moreover, as will be elaborated later, Deere's profit ratio for the more recent period was depressed by losses caused by its efforts to get established in European and other markets. It has been estimated that its operating profit ratio might have been 15.5 per cent instead of 14.8 in the 1957-67 period if these losses had been avoided. In terms of the importance of farm machinery sales to total sales and the extent of its sales in the North American market, Case comes closer to Deere than any other company. However, Case with its much smaller volume in farm machinery—around 20 per cent of Deere's—had an operating profit for the period of only 4 per cent. This low figure was heavily affected by the large losses incurred in 1960 and 1961. For the more recent period, from 1963 to 1967, Case's ratio was about 7.5 per cent compared with 15.3 per cent for Deere.

TABLE 12.6—COSTS AND PROFITS OF FARM MACHINERY COMPANIES  
PER \$100 SALES

(Averages for 1957-67)

	Deere	Massey- Ferguson	Case	Inter- national Harvester	Allis- Chalmers	White Motor <sup>1</sup>
Net sales	100.00	100.00	100.00	100.00	100.00	100.00
Cost of goods sold	73.50	80.90	80.40	80.60	83.60	80.80
Gross profits	26.50	19.10	19.60	19.40	16.40	19.20
Selling, general and admin. expenses	11.70	12.40	15.60	11.20	11.70	12.10
Operating profits	14.80	6.70	4.00	8.20	4.70	7.10
Interest and other expenses (net) <sup>2</sup>	.40	1.20	3.30	.90	.40	.70
Profits before tax	14.40	5.50	.70	7.30	4.30	6.40
Income taxes	7.70	1.80	2.60	3.50	2.00	2.90
Tax rate (income taxes as percentage of profits before tax)	54%	33%	165% <sup>4</sup>	48%	46%	45%
Net income (after tax)	6.70	3.70	(.50)	3.80	2.30	3.50
Shareholders' equity employed per \$100 sales <sup>3</sup>	63.00	40.00	45.00	53.00	54.00	25.00
Return on investment (after tax)	10.6%	9.3%	(1.1)%	7.2%	4.3%	13.8%

<sup>1</sup> For the White Motor Corporation the period 1963-67 was used because that company only entered the farm machinery industry, by acquisition, in the period 1960-62.

<sup>2</sup> "Interest and other expenses (net)" is a balancing item and includes interest expense, charges made by finance subsidiaries for financing services, the net profits of finance subsidiaries, and other minor income and expense items.

<sup>3</sup> Average of year-end balances used in computing equity figures.

<sup>4</sup> This high rate reflects the effect of heavy losses midway through the period.

Source: From D. Martinusen and B. P. Barry, *Revenues, Costs and Profits in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 11 (Ottawa: Information Canada, 1970), Table 3.2.

Table 12.6 also gives data on net income after tax as a percentage of sales and as a return on shareholders' investment for the period 1957-67. Here again, in the ratio of net income to sales, Deere shows a much higher return than any of the other five companies. However, White Motor, whose data cover only the higher sales years from 1963-67, earned a higher return than Deere on its equity investment. This partly reflects the fact that White acquired its production assets in the Oliver, Minneapolis-Moline, and Cockshutt companies at below book value. In its annual reports, White reported that Oliver was acquired at about 80 per cent of book value and Minneapolis-Moline at 63 per cent. Shareholders' equity per \$100 of sales is only \$25 for White, compared with \$63 for Deere. Deere's net income ratio is also reduced relative to those of other companies by its higher average tax rate. The tax rates for different companies vary significantly because of the different tax rates levied in different countries, losses recorded by some companies in certain years, and the advantages obtained under special tax incentives.

In interpreting the profit data for farm machinery companies it is important to recognize the rather unusual asset structure of the industry. As described in

Chapter 11, after the postwar backlog of demand had been filled in the early fifties and total sales of farm machinery declined, the North American industry introduced the practice of floor-planning new farm machines in the hands of dealers on an interest-free basis. Later, most companies extended this practice to machines accepted in trade. For all companies, this has resulted in very large additions to accounts receivable.

In addition, in the late fifties most of the major companies introduced finance plans to allow their dealers to finance sales to their farmer customers. To facilitate this increase in credit-granting, all of the six companies under examination set up finance subsidiaries. International Harvester's subsidiary was established in 1949. The rest were set up between 1955 and 1962. Most of the companies sell their dealer floor-planning notes as well as their retail sales contracts to their credit subsidiary. However, both Massey-Ferguson and Deere for the most part keep their dealer accounts receivable in the parent company.

The corporate effect of these activities is shown in Table 12.7 which provide for 1957 and 1967 a combined balance sheet for the six companies, both including and excluding the finance subsidiaries. When the accounts of the finance subsidiaries are consolidated with the accounts of the parent firm, the combined balance sheet shows an increase in accounts receivable to 50 per cent of total assets from 33 per cent a decade earlier. On the liability side there was a substantial but smaller growth in current liabilities as a source of funds. Similar but much smaller changes appear when the balance-sheet totals exclude the finance subsidiaries.

TABLE 12.7—BALANCE SHEET STRUCTURE, 1957 AND 1967, SIX MAJOR FARM MACHINERY FIRMS, INCLUDING AND EXCLUDING FINANCE SUBSIDIARIES

(Percentage of total)

	Including Finance Subsidiaries		Excluding Finance Subsidiaries	
	1957	1967	1957	1967
<b>Assets</b>				
Accounts receivable	33	50	23	27
Inventories	32	26	36	36
Net fixed assets	23	16	26	23
Other	12	8	15	14
<b>Total</b>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
<b>Liabilities</b>				
Current	26	38	18	26
Long-term debt	15	23	16	15
Equity	59	39	66	59
<b>Total</b>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>

Source: From D. Martinusen and B. P. Barry, *Revenues, Costs and Profits in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 11 (Ottawa: Information Canada, 1970), Tables 4.1, 4.2 and Appendix Tables C.8 and C.9, and Commission estimates.

TABLE 12.8—TEN-YEAR CASH FLOW, MAJOR FARM MACHINERY FIRMS, 1957-67<sup>1</sup> CONSOLIDATED DATA  
INCLUDING FINANCE SUBSIDIARIES  
(Expressed as percentages of total sources and uses of funds)

	Deere	Massey- Ferguson	International Harvester	Case	Allis- Chalmers	White Motor <sup>2</sup>	Total
							(\$ million)
<b>Sources</b>							
Net income	30.5	24.2	36.6	(3.3)	18.8	31.8	28.3
Add depreciation	15.4	19.6	28.9	14.9	22.6	8.2	21.1
Operations	45.9	43.8	65.5	11.5	41.4	40.0	49.4
Short-term debt addition — net	16.3	20.1	14.8	10.8	28.9	27.2	18.3
Accounts payable and other current liability increases	13.7	11.5	6.1	40.0	5.9	7.3	10.8
Long-term debt and other long-term liability increases	20.0	11.3	13.1	46.7	21.6	24.5	18.2
Common stock issues — net	4.1	13.3	0.5	(9.1)	2.2	1.0	3.3
Total sources	100.0	100.0	100.0	100.0	100.0	100.0	100.0
							6,137
<b>Uses</b>							
Accounts receivable increase	45.0	36.3	27.4	68.7	51.2	50.4	39.7
Inventory increase	12.6	14.7	12.7	17.6	1.9	21.0	12.5
Fixed asset additions — net	23.9	31.6	32.1	28.0	27.2	14.7	28.1
Other asset increases	3.1	4.6	1.1	(0.3)	7.2	0.7	2.8
Dividends	11.6	8.8	18.8	2.2	12.5	11.7	13.3
Retirement of preferred stock — net	1.9	2.5	3.8	(1.0)	(0.4)	1.6	2.2
Charges against retained earnings and capital surplus — net	1.9	1.5	4.1	(15.2)	0.4	(0.1)	1.4
Total uses	100.0	100.0	100.0	100.0	100.0	100.0	100.0
							6,163
Increase (decrease) in cash and marketable securities — per cent of total sources	(0.6)	0.2	(2.9)	4.2	2.7	2.1	(0.4)
							(25)

<sup>1</sup> White Motor and Allis-Chalmers have fiscal years ending December 31; the remaining firms — October 31.

<sup>2</sup> Data for five years ended December 31, 1967, only.

Source: From D. Martinusen and B. P. Barry, *Revenues, Costs and Profits in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 11 (Ottawa: Information Canada, 1970), Table C.10, and Commission analyses.

A similar picture emerges in Table 12.8, showing the source and use of cash for five of the six major firms over the 1957-67 period. These data, which include consolidated data for the finance subsidiaries, show that 40 per cent of the cash acquired by the five companies during this period was used to finance accounts receivable. Only 28 per cent of total cash was used for additions to fixed assets. In the case of Deere, the share of cash going to finance accounts receivable was even larger, 45 per cent of the total. This undoubtedly reflects Deere's heavy sales concentration in farm machinery and in the North American market coupled with its policy of consignment selling in Canada. The five firms as a group devoted some \$2.5 billion to the finance of accounts receivable over this period.

The preponderance of current as opposed to fixed assets in the balance sheets of the farm machinery companies is evident in Table 12.9. The asset-to-sales ratios of the two companies whose business is most heavily concentrated in farm machinery in the North American market, Deere and Case, are higher than those of

TABLE 12.9—NET INCOME, ASSETS EMPLOYED, RETURN ON INVESTMENT AND RETURN ON TOTAL ASSETS, SIX MAJOR FARM MACHINERY COMPANIES, INCLUDING FINANCE SUBSIDIARIES, EXPRESSED AS PERCENTAGE OF SALES, 1963-67

	Deere	Massey- Ferguson	Case	Inter- national Harvester	Allis- Chalmers	White Motor
Net sales	100.0	100.0	100.0	100.0	100.0	100.0
Net income (after tax)	6.5	4.4	3.8	4.0	2.0	3.5
Total assets employed						
Accounts receivable	75.0	50.0	79.0	37.0	48.0	37.0
Inventories	30.0	31.0	31.0	30.0	32.0	29.0
Net fixed assets	22.0	20.0	19.0	19.0	18.0	6.0
Other	6.0	3.0	15.0	11.0	11.0	4.0
Total assets	133.0	104.0	144.0	97.0	109.0	76.0
Shareholders' equity	59.0	40.0	31.0	47.0	47.0	25.0
Return on investment (after tax)	11.0	11.0	12.5	8.6	4.3	13.8
Return on total assets (after tax)	7.7	8.3	6.5	6.9	3.6	7.9

Note: Return on investment is defined as net income after tax as a percentage of shareholders' equity. Return on total assets is defined as net income after tax plus interest paid as a percentage of total assets.

Source: From D. Martinusen and B. P. Barry, *Revenues, Costs and Profits in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 11 (Ottawa: Information Canada, 1970), Table 4.13, and Commission estimates.

any other company, being 133 and 144, respectively. For each \$100 of sales, Deere on the average at its fiscal year-end was holding \$133 in assets, of which \$105 was in the form of accounts receivable or inventories and only \$22 was in the form of fixed assets. Similarly, Case had \$144 in assets for each \$100 of sales with \$110 of these assets being in the form of accounts receivable or inventory and only \$19 in the form of fixed assets. Since the asset data are taken at the date of the company's fiscal year-end—in each case, after the heavy selling season is over—these asset ratios

do not simply reflect a seasonal build-up of inventory in the hands of the company and their dealers in anticipation of the selling season. Indeed, it seems likely that data on a monthly average basis would show an even higher ratio of current to fixed assets.

Because of the comparatively low ratio of fixed to total assets, it is evident that comparatively large differences in profitability at the manufacturing level—such as would arise out of economies of scale—would result in only modest differences in the rate of return on total assets or on shareholders' equity. As demonstrated in Chapter 7, a firm with an annual tractor output of 60,000 or 90,000 units a year would earn a very much higher return on its manufacturing assets than a firm operating at the 20,000-unit level. For tractors, this roughly represents the difference between Deere and Case. Deere also undoubtedly enjoys a much larger volume than Case on combines and many other products, since its total sales of farm machinery are of the order of 4 to 5 times those of Case. Given the large volume of current assets both companies carry, it is clear that Deere's presumed higher profits at the manufacturing level will be very much diluted in its over-all return on investment or on total assets.

Measured by return on investment (net income after tax as a percentage of shareholders' equity) the long-run average profits of the five companies, or their worldwide operations for all products, are not high when compared with other large United States based corporations (White Motor is excluded because of its recent entry to the industry). A recent study of 528 large U.S. corporations shows that about two-thirds earned more than Deere, the most profitable of the five, over the period 1946-65.<sup>3</sup> The comparison is as follows:

Average Return on Investment, 528 Large U.S. Corporations 1946-65		Relative Position of Five Major Farm Machinery Companies' Return on Investment (1946-67)	
Rate of return (Per cent)	Percentage of all 528 companies	(R.O.I. shown in parentheses)	
Over 20	13		
16 - 20	14		
12 - 16	31		
10 - 12	17	Deere	(11.0)
		Massey-Ferguson	(10.3)
8 - 10	13		
6 - 8	7	International Harvester	(7.6)
		Allis-Chalmers	(6.3)
Under 6	5	Case	(3.3)
Total	100		

Three of the five firms were in the category occupied by the bottom 12 per cent of the 528 large firms.

<sup>3</sup>J. J. Scanlon, "How Much Should a Corporation Earn?" *Harvard Business Review*, Vol. 45, No. 1, January - February 1967.

The results are somewhat different when the average return on the book value of total assets is used as a criterion. On this basis, in the earlier period from 1946-56, all five of the major firms in the industry earned more than the average

TABLE 12.10—RETURN ON INVESTMENT AND RETURN ON TOTAL ASSETS,  
SIX MAJOR FARM MACHINERY FIRMS, 1946-67

(Data are after corporate taxes)

	Return on Total Assets			Return on Investment		
	1946-56	1957-67	1963-67	1947-56	1957-67	1963-67
	(Per cent)			(Per cent)		
Deere	7.9	7.4	7.7	11.5	10.6	11.0
Massey-Ferguson	7.4	7.1	8.3	14.5	9.3	11.0
International Harvester	6.4	5.5	6.9	8.2	7.2	8.6
Allis-Chalmers	6.2	3.7	3.6	9.1	4.3	4.3
Case	6.1	1.7	6.5	7.8	(1.1)	12.5
White Motor	n.a.	n.a.	7.9	n.a.	n.a.	13.8

Note: Data for return on investment include finance subsidiaries on a consolidated basis. Data for return on total assets are for parent company assets and earnings with the finance subsidiary included on a net basis. If consolidated data were available it would reduce the returns reported by around one percentage point in the later years.

Return on investment is defined as net income after tax as a percentage of shareholders' equity. Return on total assets is defined as net income after tax, plus interest paid as a percentage of total assets.

Source: From D. Martinusen and B. P. Barry, *Revenues, Costs and Profits in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 11 (Ottawa: Information Canada, 1970), Tables 3.4, 3.6, and 4.13, and Commission estimates.

TABLE 12.11—AVERAGE RATES OF RETURN ON TOTAL ASSETS  
(BOOK VALUES) IN VARIOUS INDUSTRIES IN  
THE UNITED STATES, 1948-57 and 1958-65

	Rate of Return	
	1948-57	1958-65
	(Per cent)	
Manufacturing	5.0	6.2
Machinery (excluding transportation and electrical)	5.5	6.9
Agricultural machinery	4.6 <sup>1</sup>	4.8
Fabricated metal products	5.2	6.3
Transportation equipment (excluding motor vehicles)	4.0	4.7

Note: Estimates for 1948-57 not strictly comparable with those for 1958-65. Stigler excluded income from securities, from income, and the value of securities from assets. Income was adjusted for excessive withdrawals by officers of small companies. No such adjustments were made for the later period, 1958-65.

<sup>1</sup> Stigler's original data included a breakdown for rate of return in agricultural machinery. However, his errata statement did not include this breakdown. The figure shown here for agricultural machinery is a calculation based on the relationship between agricultural machinery and machinery (excluding transportation and electrical) in the original data.

Source: D. Schwartzman, *Oligopoly in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 12 (Ottawa: Information Canada, 1970), Table 7.1.



return to the manufacturing industries studied by George Stigler<sup>4</sup>. A comparison of the earnings of the five firms using these two different concepts is given in Table 12.10. However, data for the agricultural machinery industry as a whole show lower earnings in terms of return on total assets than manufacturing as a whole or the subgroups of machinery and fabricated metal products (see Table 12.11).

#### Profits Earned by the Farm Machinery Industry in Canada

In order to assess the profits earned by the farm machinery companies operating in Canada, the Commission sent out a financial questionnaire which was completed by all the larger firms and a sample of smaller ones. It was hoped to obtain data for the period 1957-66 but changes in ownership and the disappearance of records made it necessary to limit published totals to the period 1960-66. Even then, not all companies could provide data for the earlier years of this period. Data on a more limited basis were obtained for the years 1967-69.

For purposes of analysis the various companies were classified into four groups. Group I consists of the four largest companies that have a manufacturing operation in Canada. These firms also carry out their own wholesale distribution of machines and parts. Group II includes six larger firms that perform their own wholesaling in Canada but do not manufacture in Canada. Group III consists of one firm, the Versatile Manufacturing Company. It is shown separately because published data on its operations were available and it has enjoyed unusual success in recent years. Group IV consists of six relatively small Canadian-owned manufacturers and distributors of farm machinery. Some additional information on the product lines, wholesale distribution network, and manufacturing facilities of these various firms is provided in a series of statistical tables appended to this chapter (see Tables 12.24, 12.25, 12.26 and 12.27).<sup>5</sup>

The 17 farm machinery firms surveyed accounted in 1966 for 86 per cent of all the farm machinery and repair parts sold in Canada, 85 per cent of all farm machinery manufactured in Canada, 82 per cent of the value added in such manufacturing, and 93 per cent of Canadian exports of farm machinery and repair parts. The data cover light industrial equipment as well as the farm machinery activities of these companies, but since the former is only about 10 per cent of the total, the overall results mainly reflect farm machinery operations.

Within the above percentages of total reported activities, the four firms making up Group I and the six firms constituting Group II are of overwhelming importance, as shown in the following tabulation. The four Group I companies accounted for roughly two-thirds of domestic sales and imports and for 96 per cent of exports. Groups I and II combined accounted for over 90 per cent of all three categories.

<sup>4</sup>G. J. Stigler's data are for the period 1947-56. Return on total assets was defined as the ratio of net income plus interest to total assets less investments in other companies. See *Capital and Rates of Return in Manufacturing Industries*, National Bureau of Economics Research (Princeton: Princeton University Press, New Jersey, 1963).

<sup>5</sup>Additional information on the results of the financial questionnaire will be found in D. Martinusen and B. P. Barry, *op. cit.*, Ch. 5, and Appendix A.

Breakdown by Company Groups, as Reported to Commission,  
of Canadian Domestic Sales, Exports, and Imports of Farm  
Machinery End Items and Repair Parts, 1966

(Percentage of total)

	Domestic Sales	Exports	Imports
Group I	68	96	65
Group II	26	—	35
Groups III and IV	6	4	—
	100	100	100

The data provided by the Commission's financial questionnaire also underline the degree to which Canada's exports and imports of farm machinery reflect a movement of goods from one branch or subsidiary of a company to another branch or subsidiary of the same company. Over 90 per cent of Canada's exports and imports in this industry fall into this category.

In setting out to analyze the profit situation in the Canadian industry, the Commission first had to choose an appropriate way to measure profit. One possibility was to assess the rates of return on investment, i.e. the net after-tax income as a percentage of shareholders' equity. But this would have no very clear meaning for many companies in Canada, because they operate as wholly-owned subsidiaries of large international firms. Another possibility was to measure net income as a percentage of sales. Such information is available, but it has a different meaning for firms that both manufacture and sell in Canada than for those that only sell. Thus the Commission concluded that the most useful measure of profit would be the return on total assets before tax. For all firms, assets consist mainly of accounts receivable from dealers and farmers, and inventories of machinery and parts at branch or central warehouses. For Group II companies, fixed assets now make up less than 4 per cent of total assets.

For all firms in Groups I and II, the large volume of exports or imports that occur between parent and subsidiary at what are necessarily transfer prices introduces a large element of arbitrariness into the profits that were reported. The reported profits are considered first. The extent to which they may be affected by transfer prices will then be examined.

The net returns on total assets reported by these four groups of companies for the period 1960-66 are presented below. The net return, which consists of net income before tax plus interest, is that earned on the companies' farm machinery and light industrial equipment activities. Data for the various groups of companies are provided in Table 12.12. Because the measure used here differs from that used earlier for the major international companies, a comparable measure for these companies covering their worldwide activities, and for various U.S. manufacturing industries is provided in Table 12.13.

TABLE 12.12—RETURN ON ASSETS OF CANADIAN FARM MACHINERY FIRMS BY GROUP, 1960-66 (GROUP III, 1963-68)

(Before tax basis)						
	Group I (3 of 4 companies)	Group II (5 of 6 companies)	Group III (1 company)	(3 companies)	Group IV (5 companies)	(6 companies)
1960	5.0	(3.1)	n.a.	3.4		
1961	5.8	(1.7)	n.a.	11.8	9.9	
1962	8.8	7.6	n.a.	40.9	36.4	
1963	11.6	11.9	40.9	37.9	34.9	28.1
1964	10.4	11.0	44.6	24.3	23.1	17.6
1965	9.0	9.3	38.7	30.1	33.4	25.7
1966	10.2	15.9	38.7	23.6	23.2	21.5
Averages <sup>1</sup>	8.9	8.7	40.1	25.2	26.6	22.9
1967			28.4			
1968			16.2			
Average 1963-68 <sup>1</sup>			28.4			

n.a. — not available.

Note: Return on Assets: Profit before tax plus interest payments as a percentage of total assets.

Average from Total Return to Total of Annual Assets over period.

Source: D. Martinusen and B. P. Barry, *Revenues, Costs and Profits in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 11 (Ottawa: Information Canada, 1970), Table 6.1.

TABLE 12.13—COMPARATIVE PROFITABILITY DATA: RETURN ON ASSETS AND RETURN ON INVESTMENT OF FIVE MAJOR FARM MACHINERY FIRMS AND SELECTED U.S. MANUFACTURING INDUSTRIES, AVERAGES FOR 1957-67

	Return on Assets	Return on Investment
<b>Major Farm Machinery Firms<sup>1</sup></b>		
Deere & Company	14.2	10.6
Massey-Ferguson Limited	9.1	9.3
J. I. Case Company	2.8	(1.1)
International Harvester Company	9.9	7.2
Allis-Chalmers Manufacturing Company	6.0	4.3
Average	9.7	7.3
<b>U.S. Manufacturing Industries</b>		
Fabricated metal products except machinery and transportation equipment	10.4 <sup>2</sup>	8.0 <sup>3</sup>
Machinery, except electrical and transportation equipment	12.2 <sup>2</sup>	9.1 <sup>3</sup>
Transportation equipment except motor vehicles	9.0 <sup>2</sup>	8.7 <sup>3</sup>
Motor vehicles and equipment	17.7 <sup>2</sup>	13.3 <sup>3</sup>
Total manufacturing	9.8 <sup>2</sup>	8.2 <sup>3</sup>

Note: *Return on Assets*: Profit before tax plus interest expense as a percentage of total assets.

*Return on Investment*: Net income (profit after tax) as a percentage of shareholders' equity.

<sup>1</sup>The ratios were computed for parent companies only because data on interest expense for finance subsidiaries for several companies were not available.

<sup>2</sup>Ten-year average, 1957-66.

<sup>3</sup>Nine-year average, 1957-66, excluding 1963.

Source: D. Martinusen and B. P. Barry, *Revenues, Costs and Profits in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 11 (Ottawa: Information Canada, 1970), Table 6.2.

For the period 1960-66, Group I and Group II companies earned a return on assets of 8.9 and 8.7 per cent, respectively. Profits were comparatively low during the early part of this period but increased appreciably with the higher sales levels of the mid-sixties. In almost all years the profits reported by the smaller companies in Group III and Group IV were very much larger than those earned by the major companies. The return on assets earned by Group I and II companies does not differ significantly from that earned by five major international firms over the slightly longer period from 1957-67 (see Table 12.13). It was very much lower than the return on assets of 17.7 per cent earned by the motor vehicle industry in the United States during this period. Thus, judged by return on assets, the profits earned in Canada by the farm machinery companies that account for the major part of Canadian sales must be considered moderate. Additional information on the asset structure and earnings of the firms in each group is given in the statistical data appended to this chapter (see Tables 12.28, 12.29, 12.30, and 12.31).

A summary view of the relative importance of various assets in relation to sales for each of the four groups is provided by Table 12.14. The result is similar to that presented earlier for the six international companies. In relation to sales, each group has large holdings of distribution assets and comparatively small fixed assets.

TABLE 12.14—ASSETS EMPLOYED PER \$100 SALES, GROUPS OF CANADIAN COMPANIES, 1960-66 AVERAGES

	Group I (Three Firms) <sup>1</sup>	Group II (Five Firms)	Group III (One Firm)	Group IV (Three Firms)
Net sales	100.0	100.0	100.0	100.0
Assets employed				
Distribution assets				
Wholesale notes receivable	29.3	33.0	52.5	10.9
Finished goods inventories	22.0	25.6	—	17.8
Total distribution assets	51.3	58.6	52.5	28.7
Retail notes receivable	21.7	24.8	—	—
Factory assets				
Raw materials inventories	2.8	—	} 21.1	9.0
Work-in-process inventories	8.5	—		1.8
Net fixed assets	15.7	4.7	12.4	11.9
Total factory assets	27.0	4.7	33.5	22.7
Total assets	100.0	88.1	86.0	51.4

<sup>1</sup> Excludes White Motor group; data not available for earlier part of period.

Source: D. Martinusen and B. P. Barry, *Revenues, Costs and Profits in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 11 (Ottawa: Information Canada, 1970), Table D.5.

The very much higher return on total assets earned by Versatile—from two to three times as high as the companies in Groups I and II—reflects lower costs of both manufacturing and distribution. The firm's lower manufacturing costs partly reflect the lower wage costs of the Winnipeg area. It has been estimated by the Commission's staff that wage rates, including fringe benefits, paid by farm machinery manufacturers in the Winnipeg area are about 57 per cent of those in Southern Ontario and about 50 per cent of those prevailing in Moline.<sup>6</sup> The firm has also reduced its manufacturing costs by concentrating on a limited number and sizes of products and obtaining substantial volume in these products. Its products are designed specifically for the Prairie grain region of Canada and the United States. This economizes on cost as compared with a product designed to meet a much wider range of conditions. Finally, Versatile operates with a much lower level of manufacturing overhead. Much of the design of new products and many of the management functions are carried out by the two chief owners and founders of the company.

Versatile has also saved on distribution costs by, to some degree, substituting lower prices for selling costs. It has no branch-house distribution

<sup>6</sup>N. B. MacDonald, *Locational Advantages in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 6 (Ottawa: Queen's Printer, 1970), Table C.3A.

system in Canada and instead ships parts and machines directly from its factory. By offering its dealers a larger discount, it has avoided some of the floor-planning costs of the other companies. Its ratio of sales to total assets has been significantly higher than those of the firms in Group I. Versatile's sales-to-asset ratio has also been slightly higher than the corresponding ratio for firms in Group II, even though these latter firms have no manufacturing assets in Canada.

The difference between Versatile and the older established firms can be highlighted by a comparison of Versatile's costs and profits with those of Deere, the most profitable of the major firms. Such a comparison is given in Table 12.15 for the years 1965-67 and 1967-69. For the industry as a whole the former period was much more profitable than the latter. These data show that although Versatile is a much smaller company and sells at lower prices, its ratio of cost of goods sold to net sales in the earlier period was significantly lower than Deere's but in the later period it had become moderately higher. Versatile's prices are reported to be from 20 to 30 per cent lower than those of other major firms. Versatile's selling, general, and administrative expenses — at 4 per cent of sales, compared with around 11 per cent for Deere—are also very much lower. The company's operating profit as a percentage of sales and net assets is also significantly higher than that of Deere for both periods.

TABLE 12.15—GROSS AND OPERATING PROFITS AS A PERCENTAGE OF SALES,  
AND OPERATING PROFITS AS A PERCENTAGE OF TOTAL ASSETS,<sup>1</sup>  
DEERE AND VERSATILE, 1965-67 AND 1967-69

	Deere		Versatile	
	1965-67	1967-69	1965-67	1967-69 <sup>2</sup>
Cost of goods sold as percentage of sales	73.8	77.2	69.2	80.0
Gross profit as percentage of sales	26.2	22.8	30.8	20.0
Selling, general and administrative expenses as percentage of sales	10.9	11.4	4.1	4.2
Operating profit as percentage of sales	15.4	11.4	26.7	15.8
Operating profit as percentage of assets	11.1	7.3	32.2	17.2

<sup>1</sup>Total Assets includes the assets of the finance subsidiary for Deere as income statements include finance subsidiary.

<sup>2</sup>Versatile figures for 1969 are for a 14-month period because of a change in its fiscal year-end.

Source: *Annual Reports* of companies.

While the returns on total assets earned by the firms in Groups I and II do not differ appreciably from those reported for this same period by the six major international companies examined above, the profits reported in Canada are clearly much more arbitrary in nature. All the companies in Group I export a major part of what they manufacture to the United States or other affiliates of their parent company. In addition, they import much of what they sell in Canada from a parent or foreign subsidiary. Companies in Group II

import almost all the products they sell in Canada from parent or affiliated companies in the United States or other countries. None of these transactions are in any sense carried out at arm's length. The prices involved are prices at which goods are being transferred from one division of the parent company to another division. As such, they inevitably have a somewhat arbitrary character.

These transfer prices were found to vary from company to company. In 1966 import prices ranged between 60 and 63 per cent of suggested retail price. Export prices ranged from 60 to 66 per cent of suggested retail price. Group I companies reported profits before tax of \$34.7 million in 1966. If all four companies had used the least favourable of these transfer prices—the highest transfer prices on imports, and the lowest on exports—it would have resulted in a profit before tax of only \$24.6 million. With the most favourable transfer prices, the profit before tax would have been \$46.9 million. Thus no very great precision can be attached to any estimate of profits earned in Canada. It is worth noting however that the transfer prices employed by the companies in Group I do not consistently favour either one country or the other in terms of the amount of profit accruing to a given country. The data do not suggest any deliberate attempt to manipulate the location of profits by country in order to secure a tax advantage.

The profits earned by an international company selling farm machinery in Canada include profits earned at the manufacturing level in the country from which the machinery is imported as well as the profit earned in Canada. On the other hand, the profits reported by companies that manufacture in Canada include profits earned at the manufacturing level on machinery and parts sold in other countries. Both groups of companies earn a profit at the wholesale level on the large distribution assets carried by this industry. Thus the profits earned on sales in Canada can vary substantially from one company to another, depending on how much of the product it sells is supplied from plants in Canada compared with plants in other countries, and on how much of its manufacturing output in Canada is sold for export. An illustration of the way in which companies earning the same global profit can have different proportions of this profit recorded in Canada is given in Table 12.32 at the end of this chapter.

To get a picture of the total profits earned by the international farm machinery companies on their sales to Canadian farmers, the Commission asked the companies to report profits they earned outside of Canada on their sales in Canada. Initially, many of the companies questioned not only the Commission's purpose but also its right to obtain information on profits earned outside of Canada. In the final analysis nearly all of them agreed to provide the Commission with the data requested. Two companies, however, Ford and International Harvester, remained holdouts to the end, refusing to provide the Commission with the data requested. To complete its picture, the Commission

prepared estimates of the profits earned outside the country by these firms and submitted them to the companies for comment and adjustment. In the end, each agreed that the estimates prepared were reasonable.

The results of this analysis are presented in Table 12.16. For six of the major companies in Groups I and II, it provides an estimate for one year, 1966, of profits earned on a worldwide basis from their sales of farm machinery in Canada. The table divides the reported sales and the costs and profits associated with them into two major groups—arm's length sales (sales to dealers in Canada or exported to non-affiliated companies), and those made to affiliated companies in other countries, mainly the United States. Domestic sales in Canada comprise goods manufactured in Canada, shown in column 1 at their manufacturing cost (\$74.9 million) and imported wholegoods and repair parts, also shown in column 1 at their transfer price to the Canadian affiliate (\$173.3 million). Net sales in Canada by these six companies in 1966 amounted to \$310.1 million and against this they reported a gross profit of \$61.9 million. After deducting selling costs, and general and administrative expenses, their reported operating profit was \$25.2 million. The companies also reported profits earned on their export sales, giving a total gross profit against all sales of \$82 million and an operating profit of \$44.8 million (shown in column 4).

However, these companies also earned a profit at the manufacturing level on the finished machines and parts that were imported from affiliated firms in other countries. This gross profit is shown under columns 1 and 5 in row 8 in the amount of \$28.2 million. Since it costs little or nothing to transfer goods from a branch of the parent company in one country to an affiliated branch in another, these gross profits are also taken as a measure of operating profits net of selling, general and administrative expenses. Thus the total operating profit earned by these international farm machinery companies on a worldwide basis as a result of their sales in Canada amounted in 1966 to \$53.8 million, compared with the \$25.2 million reported as earned in Canada. The inclusion of profits earned outside Canada makes the profit earned on Canadian sales twice as large and increases it from 8.1 per cent of domestic sales in Canada to 17.3 per cent.

A comparison of this total with the data presented in Table 12.9 for six major international companies (not identical with the six above) indicates that profits on domestic Canadian sales were significantly higher than those earned by the six companies on a worldwide basis on all products in the period 1963-67. However, it must be noted that 1966 profits in Canada were higher than in any other year in the period 1963-67. Since no information is available on the assets used to support these sales, it is not possible to estimate a return to total assets for domestic Canadian sales. A rough rule-of-thumb is that farm machinery companies have about the equivalent of one



TABLE 12.16—ESTIMATED WORLDWIDE PROFITS BEFORE TAXES AND INTEREST ON CANADIAN DOMESTIC SALES  
OF FARM MACHINERY, 1966

(Data relate to operations of six Canadian Group I and II companies and are expressed in millions of Canadian dollars)

	Arm's Length Sales		Sales to Affiliates		Foreign Affiliates' Sales to Canadian Companies	
	Domestic	Export	(Exports)	Total Sales	Wholegoods and Finished Parts	Materials and Components for Use in Manu- facturing in Canada
1. Net sales	(1)	(2)	(3)	(4)	(5)	(6)
2. Imported wholegoods and finished parts for sale	310.1	3.4	167.0	480.5		14.5
3. Manufactured wholegoods and parts	(173.3)	(2.6)	(147.7)	(173.3)	173.3	14.5
4. Total cost of goods sold	(74.9)	(2.6)	(147.7)	(225.2)		
5. Gross profit	(248.2)	(2.6)	(147.7)	(398.5)	(145.1)	(13.2)
6. Total selling, general and administrative expenses	61.9	0.8	19.3	82.0		
7. Operating profit	(36.7)	(0.5)	19.3	(37.2)		
	25.2	0.3		44.8		
WITHIN CANADA						
OUTSIDE CANADA						
8. Add gross profit earned by foreign affiliates on sales of wholegoods to Canadian companies <sup>1</sup>					28.2	
9. Add profits earned by foreign affiliates on sales of components to Canadian companies <sup>2</sup> (included in costs shown in line 3 above)	0.4	0.1	0.8			
10. Estimated global operating profits on Canadian sales	53.8	0.4	20.1			
11.		54.2				1.3
					28.2	
						Gross profit on sales of wholegoods and finished parts
						Gross profit on sales of components

<sup>1</sup> Must be earned on domestic sales of wholegoods and finished parts for sale only.

<sup>2</sup> Must be allocated to manufactured output, allocation made pro-rata to manufacturing costs shown.

Source: From D. Martinusen and B. P. Barry, *Revenues, Costs and Profits in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 11 (Ottawa: Information Canada, 1970), Table 6.3 and Commission analysis.

year's sales in the form of assets. This would suggest that the return to total assets before tax would be about the same percentage as the return to sales, namely 17.3 per cent. The year 1966 was clearly a very profitable year for farm machinery companies selling in Canada.

Table 12.16 also shows the profits earned on export sales by the farm machinery companies operating in Canada. Export sales to affiliated companies, shown in column 3, amounted to \$167 million in 1966 and on these sales the companies reported gross profit of \$19.3 million. This can also be taken as a measure of the operating profit, since it can be assumed that there is no cost involved in selling to an associated company. The international companies involved would also earn a distribution profit on these goods before they were finally sold through their dealer organization in the foreign country to the farmer. Thus the operating profit in Canada, amounting to 11.6 per cent of the value of export sales, cannot be compared directly with the operating profit earned on domestic sales in Canada. Similarly, the total operating profit reported to the Canadian tax authorities, \$44.8 million (see column 4)—since it is a compound of profits earned at the manufacturing level on export sales, profits earned at the distribution level on goods manufactured in other countries, and some profits earned at both the manufacturing and distribution level in Canada—has no very clear meaning interpreted as a ratio to sales.

The data in Table 12.16 underline the difficulty of interpreting the profits reported in a single country such as Canada by an international farm machinery company that imports and exports on a substantial scale and manufactures its machinery in many different countries. Within fairly broad limits, these companies can shift profits from one country to another by the transfer prices they charge when imports or exports move between different branches of the same company. And if corporate tax rates vary from one country to another, they will have an incentive to show more of their profit in the country with the lowest tax rate. It is worth noting that the total value of imports by the companies covered in Table 12.16, amounting in 1966 to \$173.3 million of wholegoods and finished parts and \$14.5 million of component parts, was only moderately higher than the value of their exports to affiliated companies, \$167 million. Yet the profits earned at the manufacturing level on imports were \$28.2 million, 15 per cent, compared with just \$19.3 million, 11.6 per cent, on exports. Some of this difference in profitability may reflect the relative importance of the companies involved and the difference in the transfer-price ratios used by these different companies.

The Commission also collected data on profits for different categories of sales. One such breakdown, a division between wholegoods and repair parts, is shown in Table 12.17. It indicates that the gross profit margin is 30.8 per cent on repair parts, compared with 18.2 per cent on wholegoods. The *net* profit margin is 20.3 per cent on repair parts, compared with 5.8 per cent on wholegoods. The higher profit margin on repair parts could be expected, since the companies undoubtedly regard this as a captive market and feel free to price at a higher level

without any risk of losing business. It is true that the companies carry a large parts inventory in relation to sales. Massey-Ferguson reported that their North American parts inventory at the end of the 1966 fiscal year was 102 per cent of their annual sales of parts. On the other hand, parts are not sold on an interest-free floor-planning arrangement or provided to the farmer on credit. Thus the company does not have nearly as large a volume of accounts receivable from dealers and farmers arising out of parts sales as is true for wholegoods. On balance, it does not appear that the investment held against these two types of sales should differ appreciably. The data in Table 12.14 show that the ratio of investment assets to sales is 100 for Group I companies and 88 for Group II companies. The latter companies would also hold manufacturing assets in the United States and other countries against their sales in Canada. If a one-to-one ratio of assets to sales in each part of the business is taken as a norm, then the percentages given in Table 12.17 can also be viewed as measuring the return on total assets.

Nevertheless, some caution is needed in interpreting these data. The higher profit margin shown for repair-parts sales is strongly affected by the transfer prices charged to the Canadian subsidiaries by their parent companies. The discounts allowed for parts and wholegoods are probably based to some degree on custom, and may reflect actual differences in cost in only a rough way. Even apart from the transfer-price question, the net profit margin depends on the fairly rough allocation of a number of cost items. Moreover, in managing a parts operation, costs may be incurred in emergency situations that do not get fully charged to the parts operation. Still, the profit division probably reflects in a rough way the profits the companies would see themselves making on these two different sectors of their operation.

TABLE 12.17—GROSS AND NET PROFITS BEFORE TAX ON WHOLEGOODS  
AND REPAIR PARTS FOR GROUP I AND II COMPANIES,  
AVERAGES FOR PERIOD 1962-66

	Wholegoods		Repair Parts	
	(\$'000)	(Percentage of net sales)	(\$'000)	(Percentage of net sales)
Gross Profits				
Total — Groups I and II	49,352	18.2	12,139	30.8
Net Profits				
Total — Groups I and II	15,620	5.8	8,018	20.3

Source: D. Martinusen and B. P. Barry, *Revenues, Costs and Profits in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 11 (Ottawa: Information Canada, 1970), Table 6.5.

For the period since 1966, data on sales costs and profits recorded in Canada of the farm machinery companies operating in Canada were collected on a less detailed basis. A summary of these data, presented in Table 12.18, shows that total

sales for these companies reached a peak of \$580 million in 1967 and have since declined by almost \$90 million. While the cost of goods sold has also declined since 1967, by some \$54 million, the decline has been proportionately less. As a result, gross profits have fallen sharply from their peak in 1966 of \$109 million to just under \$67 million in 1969. Since selling, general, administrative and other expenses have continued to rise, the result has been an extremely sharp fall in profits before tax. Indeed, between 1966 and 1969, these companies moved from a before-tax profit of \$48.5 million to a net loss of almost \$2 million. The after-tax situation changed over the same period from a profit of \$30 million in 1966 to a net profit of only \$.6 million by 1969. Details showing these changes for each of the four groups of companies are given in Tables 12.33 to 12.36, appended to this chapter.

Some further insight into this rapidly changing profit picture is provided by the data in Table 12.19 which shows for these companies their cost of goods sold, expenses, and profits, as a percentage of sales over the period 1961-69. The cost of goods sold, as a percentage of net sales, rose sharply from 80.8 per cent in 1966 to 86.4 per cent in 1969. The corresponding decline in the gross profit ratio was from 19.2 to 13.6 per cent of net sales. The data also reveal the significant rise in the ratio of net expenses (selling, general, administrative and other expenses, less interest and other income) from 10.7 per cent in 1966 to 14.0 per cent in 1969. The 1969 ratio is almost the same as that which prevailed in 1962.

No simple explanation can be provided for this sharp rise in cost and expense ratios. The data reflect very large exports and imports, and the transfer prices established on the flow of machines across the Canadian border will substantially affect the amount shown for cost of goods sold and its ratio to net sales. The increase in net expenses undoubtedly reflects the effects of inflation in general on salaries and wages and other costs. An important but undetermined amount must be due, as well, to the rise in interest rates and the cost to the farm machinery companies of the funds required to finance their accounts receivable from dealers. For some companies, these accounts are carried by their finance subsidiaries, but for at least two major companies they appear in the companies' main accounts. Although no precise data are available as to the amounts involved, there is reason to believe that a significant part of the farm machinery companies' sales in recent years have reflected a build-up of inventory in the hands of their dealers, financed by the companies on an interest-free basis. For six major companies it has been reported that between 1964 and 1968 total accounts receivable (including those held by unconsolidated finance subsidiaries) increased by \$1,841 million, whereas their wholesale sales rose only by \$1,265 million in this same period.<sup>7</sup> These data are for the international operations of the six companies.

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<sup>7</sup>*Special Report, The Farm Machinery Industry*, Pitfield, Mackay, Ross and Company Limited, 1969.

TABLE 12.18—CANADIAN FARM MACHINERY COMPANIES: SALES, COSTS AND PROFITS, 1961-69

	(Canadian dollars)								
	1961	1962	1963	1964	1965	1966	1967	1968	1969
1. Net sales	231,809	283,943	366,372	427,830	480,555	570,348	580,126	485,075	491,077
2. Cost of goods sold	190,929	225,550	292,740	348,755	394,590	461,008	478,207	406,972	424,180
3. Gross profit	40,880	58,393	73,632	79,075	85,965	109,340	101,919	78,103	66,897
4. Selling, general, and administrative expenses	29,633	31,318	34,832	37,376	39,253	44,395	46,643	47,893	53,932
5. Other expenses	12,417	13,041	14,018	15,910	19,747	24,517	27,723	30,445	31,770
6. Total expenses	42,050	44,359	48,850	53,286	59,000	68,912	74,366	78,338	85,702
7. Interest and other income	4,262	4,810	5,277	6,971	7,315	8,111	12,248	13,043	16,877
8. Total expenses (net)	37,788	39,549	43,573	46,315	51,685	60,801	62,118	65,295	68,825
9. Profit before tax/loss	3,092	18,844	30,059	32,760	34,280	48,539	39,799	12,809	1,929
10. Taxes/credit	4,102	10,080	15,567	15,006	12,858	18,509	20,232	5,715	2,567
11. Net profit/loss	1,010	8,764	14,492	17,754	21,422	30,030	19,567	7,094	638

Note: Italics indicate subtracted figures or (in lines 9 and 11) loss position.

Source: Tables 12.33, 12.34, 12.35, and 12.36.

TABLE 12.19—ANALYSIS OF REVENUES, COSTS AND PROFITS, FARM MACHINERY COMPANIES, 1961-69

	(Each year's net sales (revenues) = 100)								
	1961	1962	1963	1964	1965	1966	1967	1968	1969
Net sales	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Cost of goods sold	82.4	79.4	79.9	81.5	82.1	80.8	82.4	83.9	86.4
Gross profit	17.6	20.6	20.1	18.5	17.9	19.2	17.6	16.1	13.6
Net expenses	16.3	13.9	11.9	10.8	10.8	10.7	10.7	13.5	14.0
Profit/loss before tax	1.3	6.7	8.2	7.7	7.1	8.5	6.9	2.6	.4
Taxes/credit	1.7	3.6	4.2	3.5	2.7	3.2	3.5	1.2	.5
Net profit/loss	.4	3.1	4.0	4.2	4.4	5.3	3.4	1.4	1.1

Note: Italics indicate subtracted figures or loss position.

Source: Calculated from data given in Table 12.18.

TABLE 12.20—ANALYSIS OF REVENUES, COSTS AND PROFITS, GROUP I AND II FARM MACHINERY COMPANIES, 1961-69

	(Each year's net sales (revenues) = 100)									
	1961	1962	1963	1964	1965	1966	1967	1968	1969	
Group I (Deere, International Harvester, Massey-Ferguson, White)										
Net sales	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Cost of goods sold	82.3	80.0	80.6	82.7	83.5	82.6	83.7	86.0	88.6	
Gross profit	17.7	20.0	19.4	17.3	16.5	19.4	16.3	14.0	11.4	
Net expenses	14.6	13.0	10.8	9.7	9.7	9.8	9.6	12.4	12.7	
Profit/loss before tax	3.1	7.0	8.6	7.6	6.8	7.6	6.6	1.7	1.3	
Taxes/credit	1.6	3.6	4.4	3.5	2.4	2.7	3.4	0.7	1.2	
Net profit/loss	1.5	3.4	4.2	4.1	4.4	4.9	3.2	1.0	0.1	
Group II (Allis-Chalmers, Case, Ford, New Idea, New Holland)										
Net sales	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
Cost of goods sold	83.4	77.0	76.7	77.1	77.6	75.2	80.0	78.2	77.6	
Gross profit	16.6	23.0	23.3	22.9	22.4	24.8	20.0	21.8	22.4	
Net expenses	24.9	19.7	17.8	17.7	16.9	15.7	16.8	19.5	21.6	
Profit/loss before tax	8.3	3.3	5.5	5.2	5.5	9.1	3.2	2.3	0.9	
Taxes	2.6	3.0	3.4	1.9	2.5	3.6	1.6	1.2	1.1	
Net profit/loss	10.9	0.3	2.1	3.3	3.0	5.5	1.6	1.1	0.2	

Note: Italics indicate subtracted figures or loss position.

Source: Calculated from data given in Tables 12.33 and 12.34.

A comparison of the four companies that have extensive manufacturing operations in Canada (Deere, International Harvester, Massey-Ferguson, and White Motor) with those who import almost all the machinery they sell here (Allis-Chalmers, Case, Ford, New Idea, and New Holland) reveals some significant differences. As Table 12.20 shows, the former companies have recorded a sharp rise in the ratio of cost of goods sold to net sales, whereas for the latter group of companies (apart from some significant year-to-year fluctuations) there has been no appreciable rise in this ratio. In contrast, the latter group shows a significant increase in the ratio of net expenses to net sales. These trends are roughly offsetting. As a result, both groups show about the same decline in the ratio of their profit before and after tax to net sales.

Finally, it must be emphasized that the decline in profits shown in Table 12.18 are in respect to profits reported within Canada only. As was demonstrated in Table 12.16, in 1966 on sales of farm machinery in Canada, profits earned outside Canada were somewhat larger than those earned in Canada. No information is available as to how these profits have changed since 1966. However, it is possible that they have declined a good deal less than the profits reported as earned in Canada.

Some support for this view is given by the data in Table 12.21 which compares net sales and net profits for the four largest companies producing and selling farm machinery in Canada (the Group I companies), with the net sales and profits of the international companies of which the four Canadian divisions are subsidiaries. Up until 1966 the experience of the parents and subsidiaries was similar. Both showed a substantial growth in sales and net profits. However, beginning in 1967 the profits of the Canadian subsidiaries declined sharply. Net profits recorded by the parent firms also declined, but much more moderately.

TABLE 12.21—COMPARISON OF SALES AND PROFITS FOR GROUP I COMPANIES, CANADIAN SUBSIDIARIES AND TOTAL PARENT ORGANIZATION, 1963-69

	1963	1964	1965	1966	1967	1968	1969
(Millions of dollars)							
<u>Canadian Subsidiaries</u>							
Net sales	306.3	353.6	390.3	455.1	451.9	364.9	358.9
Net profit/loss	12.9	14.3	17.4	22.4	14.4	3.6	0.3
Profit/loss as percentage of net sales	4.2	4.0	4.5	4.9	3.2	1.0	0.1
<u>Parent Companies</u>							
Net sales	4,165	4,637	4,979	5,710	5,663	5,694	6,061
Net profit	167	235	230	283	220	181	174
Profit as percentage of net sales	4.0	5.1	4.6	5.0	3.9	3.2	2.9

Note: Italics indicate loss position.

Source: Based on data collected by the Commission for Canadian companies and on *Annual Reports* of companies. Data for Canadian subsidiaries is primarily farm machinery but includes some light industrial equipment. Data for parent companies include large truck sales for two companies, International Harvester and White Motor, and large sales of heavy construction equipment for International Harvester.

While in 1969 the parent organizations showed some increase in sales and a net profit of 2.9 per cent of sales, the four Canadian subsidiaries recorded a further small drop in sales and a net loss of 0.1 per cent of sales. Since profits earned outside Canada on sales in Canada probably depend on the firm's general profitability at the manufacturing level, it seems likely that these may have moved more in line with those of the parent company as a whole. On the other hand, profits reported in Canada include profits earned on exports as well as domestic sales.

Before attempting to summarize the profits picture, a brief comparison will be made with profit levels in an earlier period. In both the twenties and thirties, the profits earned by the major farm machinery companies in the United States appear to have been much higher than in recent years. The relevant data are summarized in Table 12.22. In 1929, International Harvester earned a return on investment of 20.6 per cent. Deere's return at 30.2 per cent was even higher. Even in 1936 the

TABLE 12.22—PROFIT RATES OF MAJOR FARM MACHINERY COMPANIES,  
UNITED STATES, 1929 AND 1936

	Gross Profits		Net Profits		Return on Investment	
	1929	1936	1929	1936	1929	1936
	(Percentage of net sales)		(Percentage of net sales)		(Percentage)	
International Harvester	33.9	30.9	15.3	17.1	20.6	15.9
Deere	42.6	44.2	28.8	27.5	30.2	23.6
Allis-Chalmers	16.5	28.1	5.1	11.0		
Case	40.6	41.5	15.9	18.3	9.2	9.4
Oliver	34.8	31.2	10.0	7.7	7.3	6.1
Minneapolis-Moline	28.6	29.9	11.8	6.1	9.0	4.9
Massey-Harris	23.4	17.6	0.7	-2.9	0.6	-2.8

Source: Based on D. Schwartzman, *Oligopoly in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 12 (Ottawa: Information Canada, 1970), Tables 7.2 and 7.3.

two companies were still earning 16 and 23.6 per cent, respectively. Profits earned by the smaller companies were much lower than this. Moreover, the profits earned by the full- and long-line companies, 18.2 per cent on total assets before tax for the period 1927-29, were very much higher than those earned by the short-line firms, namely, 5.5 per cent (see Table 12.23).

In interpreting the profits data presented in this chapter it is useful to keep in mind certain developments that have occurred over the postwar period. The first of these was the change in the volume of sales available to each firm. Although the dollar value (at constant prices) of farm machinery sold in North America has continued to grow, the number of units manufactured for major machines has declined significantly. Tractor output declined from a peak of 567,000 in 1951 to 242,000 by 1967. Combine production fell from 134,000 in 1950 to 53,000 in 1965. This trend to fewer units reflects a number of considerations, including a decline in exports, the move to fewer and larger farms, and the filling of the



TABLE 12.23—PROFITS OF FULL- AND LONG-LINE COMPARED TO  
SHORT-LINE FARM MACHINERY MANUFACTURERS,  
UNITED STATES, 1927-29

	Gross Profits	Net Profits	Return on Total Assets (Before Tax)
	(Percentage of sales)		
Full-line and long-line	33.1	16.8	18.2
Short-line	28.7	5.1	5.5

Source: Federal Trade Commission, *Report on Agricultural Implements and Machinery Industry*, 1938, pp. 620-2.

backlog of demand that had existed at the end of the war. Whatever its cause, the effect of this decline in the number of units produced may well have been to increase the significance of economies of scale. Ten per cent of the tractor market in 1951 meant an annual output of 57,000. By 1967 a 10 per cent share amounted to only about 24,000. Because the cost penalty on small volume increases as output declines, this will mean that the major firm has a larger cost advantage over the smaller firm today than it had 20 years ago.

A second development has been the increased importance of distribution assets in company balance sheets as a result of the introduction of interest-free floor-planning for dealers and the financing of sales to farmers. For Deere & Company, the ratio of accounts receivable to net fixed assets increased from just under 2.5 to 1 in 1957 to over 4 to 1 by 1967. Thus the return to manufacturing assets are effectively masked in company statements by the large assets the farm machinery companies carry in the form of accounts receivable (or their equivalent) from farmers and dealers.

A third development that has affected the profits reported by the international companies has been the growing importance of international trade in farm machinery, especially for tractors, and in the international "sourcing" of components. (These developments are more fully described in Chapter 14, and certain aspects have also been discussed in some detail in the Commission's *Special Report on Prices*.) This comparatively recent trend suggests that profits are likely to be significantly affected in the future by the way in which the international firm deploys its manufacturing plants in different countries and sources components and machines to different markets. However, up until this date, the major part of the farm machinery sold in North America is still manufactured there.

In the light of these considerations, what conclusions are supported by the analysis of profits in the farm machinery industry? The evidence is consistent with the view that for important products such as tractors and combines the major companies have kept their prices high in relation to manufacturing costs. This has allowed the smaller companies with lower volume and higher unit costs to earn a

moderate return, survive, and even expand their share of the market. Some of the smaller firms have survived only after reorganization and a major writing-down in asset values. Thus, Oliver, Minneapolis-Moline, and Cockshutt, disappeared as independent companies during the postwar period. White Motor, which took over the assets of these three firms, closed a number of factories and consolidated production in the remaining factories to take greater advantage of economies of scale.

The high prices maintained by the major companies have attracted new entrants, and have allowed smaller firms to use price to expand their market share. As a result, the market share of the major companies has declined. For tractors, the new entrants have included British firms such as British Leyland and David Brown as well as North American firms like Versatile. Almost all firms have begun to supply the North American market for smaller-horsepower tractors with models manufactured in whole or in part in Europe. For combines, foreign-manufactured models have been important, too—as with New Holland's Clayson machines and the Claas combine first imported by C.C.I.L. and now by Ford. Versatile has also entered this market. Because the industry has moved to a higher-cost distribution system where dealers are encouraged to carry large inventories of machines by a system which provides interest-free floor-planning for up to two selling seasons, high prices have in some measure been reflected in higher costs rather than high profits.

For other products the evidence is less clear, but the declining market share experienced by the Big Three suggests that here, too, products have been priced high in relation to costs. This has enabled the smaller firms to increase their share of the market by selling at lower prices. Certainly, this appears to have been true for Versatile's invasion of the swather market. It may also have been true for gains made by smaller firms such as Morris Rod Weeder, C.C.I.L., and others in the market for diskers, and for tilling, cultivating and weeding equipment.

Thus, while on an average over a period of years the profits earned by the major farm machinery companies have been moderate when compared with those earned in manufacturing as a whole, or when compared with major firms in many other industries, the industry has followed a policy of pricing its products at a high level in relation to manufacturing costs and has developed an expensive distribution system which has effectively concealed the high profits earned at the manufacturing level. This has made them vulnerable to competition from smaller firms, even though the latter do not enjoy the same economies of large-scale production. The smaller firms have had lower distribution costs, evident in their higher rate of turnover of distribution assets. Some of them, such as Versatile and others, have manufactured their products in lower-cost locations, thus offsetting in some degree the higher costs that accompany lower-volume manufacturing operations.

TABLE 12.24—FARM MACHINERY PRODUCTS SOLD BY CANADIAN COMPANIES, BY GROUP

	Farm Machinery Products Sold in Canada
<u>GROUP I</u>	
John Deere Limited	Full line of agricultural implements
International Harvester Company of Canada, Limited	Full line of agricultural implements
Massey-Ferguson Industries Limited	Full line of agricultural implements
White Motor Corporation Subsidiaries: Cockshutt Farm Equipment of Canada Limited, and Minneapolis- Moline of Canada, Ltd.	Full line of agricultural implements
<u>GROUP II</u>	
Allis-Chalmers, Rumely, Limited	Full line of agricultural implements
Avco New Idea Farm Equipment Division, Avco Distributing Corporation	Haying, harvesting machinery Agricultural tractors
David Brown Tractors (Canada) Limited	Full line of agricultural implements
J. I. Case Company	
Ford Tractor and Equipment Sales Company of Canada, Limited	Agricultural tractors, plows, harrows, cultivators, planters, fertilizers, haying machinery, forage harvesters, cutters, combines
New Holland Division, Sperry Rand Canada Limited	Haying, harvesting machinery
<u>GROUP III</u>	
Versatile Manufacturing Ltd.	Four-wheel-drive tractors, hay conditioners, combines, swathers, windrowers, spraying equipment, grain elevators
<u>GROUP IV</u>	
Agristeel Fabricators Ltd.	Field cultivators, spraying and dusting equip- ment, cabs
Golden Arrow Manufacturing Limited	Dry fertilizer spreaders, spraying equipment, high pressure pumps
Killbery Industries	Hay conditioners, swathers, spraying equipment
McCoy-Renn Mfg. Ltd.	Pick-up attachments, grain rollers, post drivers, hydraulic hoists
McKee Bros. Limited	Combines, forage harvesters, wagons, implement hitches, animal waterers, snow blowers
Morris Rod Weeder Company Limited	Chisel plows, rod weeders, grain drills

Source: D. Martinusen and B. P. Barry, *Revenues, Costs and Profits in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 11 (Ottawa: Information Canada, 1970), Table 5.1.

TABLE 12.25—WHOLESALE ACTIVITIES OF CANADIAN FARM MACHINERY COMPANIES, BY GROUP, 1966

	<u>Branch Location</u>	<u>Number of Branches</u>	<u>Number of Franchised Retail Dealers</u>
<b>GROUP I</b>			
John Deere Limited	Hamilton, Ont.; Winnipeg, Man.; Regina, Sask.; Calgary, Alta.	4	505
International Harvester Company of Canada, Limited	Saint John, N.B.; Quebec, Que.; London, Ont.; Winnipeg, Man.; Regina, Sask.; Saskatoon, Sask.; Calgary, Alta.; Edmonton, Alta.	8	616
Massey-Ferguson Industries Limited	Toronto, Ont.; Montreal, Que.; Winnipeg, Man.; Saskatoon, Sask.; Calgary, Alta.	5	715
White Motor Corporation Subsidiaries:			
Cockshutt Farm Equipment of Canada Limited	Brampton, Ont.; Winnipeg, Man.; Regina, Sask.; Edmonton, Alta.; Calgary, Alta. Transfer Points: Medicine Hat, Alta.; Brandon, Man.	7	406
Minneapolis-Moline of Canada, Ltd.	Regina, Sask.; Saskatoon, Sask.; Calgary, Alta.; Edmonton, Alta.; Winnipeg, Man. Transfer Points: Toronto, Ont.; Brandon, Man.	7	206
<b>GROUP II</b>			
Allis-Chalmers, Rumely, Limited	Edmonton, Alta.; Fredericton, N.B.; Halifax, N.S.; London, Ont.; Ottawa, Ont.; Toronto, Ont.; Montreal, Que.; Quebec, Que.; Trail, B.C.; Vancouver, B.C.; Winnipeg, Man.	11	288
Avco New Idea Equipment Division, Avco Distributing Corporation	Waterloo, Ont.	1	92
David Brown Tractors (Canada) Limited	Halifax, N.S.; Montreal, Que.; London, Ont.; Winnipeg, Man.; Amherst, N.S.; Edmonton, Alta.; Vancouver, B.C. Parts Depot: Toronto, Ont.	8	178
J. I. Case Company	Calgary, Alta.; Winnipeg, Man.; Regina, Sask.; Montreal, Que.; Toronto, Ont.	5	421
Ford Tractor and Equipment Sales Company of Canada, Limited	Montreal, Que.; Bramalea, Ont.; Winnipeg, Man.; Regina, Sask.; Edmonton, Alta.	5	267
New Holland Division Sperry Rand Canada, Limited	Ottawa, Ont.; Winnipeg, Man.; Calgary, Alta.	3	386
<b>GROUP III</b>			
Versatile Manufacturing Ltd.	Ships from head office in Winnipeg, Man.; also operates a branch in Fargo, North Dakota.	2	743
<b>GROUP IV</b>			
	Not included because wholesaling activities largely carried out through independent organizations.		

Note: Marketing arrangements of Group IV companies are quite varied.

Source: From D. Martinusen and B. P. Barry, *Revenues, Costs and Profits in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 11 (Ottawa: Information Canada, 1970), Table 7.2.

TABLE 12.26—FARM MACHINERY FACTORY LOCATIONS AND FACTORY EMPLOYMENT,  
CANADIAN FARM MACHINERY COMPANIES, BY GROUP, 1966

	Factory Location	Square Footage	Approximate Factory Employment <sup>1</sup>	Products Produced
<b>GROUP I</b>				
John Deere Limited	Welland Works, Welland, Ontario	709,000	400	Harrows, tillers, hoes, mowers, rotary cutters, windrowers, wagons, industrial equipment
	Hamilton Works, Hamilton, Ontario	2,074,000	3,250	Plows, drills, manure spreaders, harrows, weed- ers, field cultivators, mowers, balers, baler twine, combines, windrowers, industrial equip- ment
Massey-Ferguson Industries Limited	Toronto, Ontario	1,904,028	2,760	Balers, pick-ups, components for Combine Plant, swathers, windrowers, corn pickers
	North American Combine Plant, Brantford, Ontario	571,675	1,100	Combines and attachments
	"M" Foundry, Brantford, Ontario	192,229	480	Castings for plants
White Motor Corporation Subsidiary: Cocksutt Farm Equipment of Canada Limited	Verity Plant, Brantford, Ontario	522,754	1,000	Plows, sub soilers, harrows, cultivator hitches, mowers, rakes, grain boxes, hay conditioners
	Brantford, Ontario	n.a.	800	Combines
<b>GROUP III</b>				
Versatile Manufacturing Ltd.	Winnipeg, Manitoba	187,000	500	Four-wheel-drive tractors, hay conditioners, combines, swathers, spraying equipment, grain elevators

## GROUP IV

Agristee Fabricators Ltd.	Minnedosa, Manitoba	n.a.	190	Field cultivators, spraying and dusting equipment, cabs
Golden Arrow Manufacturing Limited	Calgary, Alberta	n.a.	50	Dry fertilizer spreaders, spraying equipment, high pressure pumps
Killberry Industries	Winnipeg, Manitoba	n.a.	150	Hay conditioners, swathers, spraying equipment
McCoy-Renn Mfg. Ltd.	Calgary, Alberta	n.a.	90	Pick up attachments, grain rollers, post drivers, hydraulic hoists
McKee Bros. Limited	Elmira, Ontario	n.a.	35	Forage harvesters, wagons, implement hitches, animal waterers, snow blowers
Morris Rod Weeder Company Limited	Yorkton, Saskatchewan	n.a.	76	Chisel plows, rod weeders, grain drills, fertilizer attachments

n.a. — not available.

<sup>1</sup>Number of factory workers in 1968 as given in: Scott's *Industrial Directory 1968-69*, Oakville: Penstock Publications Limited, 1968, both the Ontario and Western sections.

Source: D. Martinusen and B. P. Barry, *Revenues, Costs and Profits in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 11 (Ottawa: Information Canada, 1970), Table 5.7.

TABLE 12.27—DOMESTIC NET SALES, EXPORTS AND IMPORTS OF FARM MACHINERY AND LIGHT INDUSTRIAL EQUIPMENT,  
17 MAJOR CANADIAN FARM MACHINERY FIRMS, BY GROUP, 1966(1)  
(Millions of Canadian dollars)

	Group I	Group II	Groups III & IV	Total 17 Companies
Domestic net sales				
Farm machinery	247.2	95.7	22.9	365.8
Light industrial equipment	(2)	(2)	—	39.5
	(2)	(2)	22.9	405.3
Exports				
Farm machinery	164.2	—	6.0	170.2
Manufacturing components	6.2	—	—	6.2
	170.4	—	6.0	176.4
	(2)	(2)	28.9	581.7
Total net sales				
Imports				
Farm machinery(3)	137.2	72.7	0.2	210.1
Light industrial equipment(3)	(2)	(2)	—	25.7
Materials and manufacturing components	42.5(4)	—	3.8	46.3
	(2)	(2)	4.0	282.1
Net exports (imports)				
Farm machinery	27.0	(72.7)	5.8	(39.9)
Light industrial equipment	(2)	(2)	—	(25.7)
Materials and manufacturing components	(36.3)	—	(3.8)	(40.1)
Balance of trade	(2) (5)	(2)	2.0	(105.7)

(1) Repair parts included in respective product categories of farm machinery and light industrial equipment.

(2) Breakdown withheld where fewer than three firms reported in a category.

(3) Breakdown of imports between farm machinery and light industrial equipment for resale estimated in some cases.

(4) \$42.5 million is made up of \$14.5 million imported from affiliates and \$28.0 million from other sources.

(5) Balance of trade in farm machinery, \$9.3 million of imports over exports, would have been \$52.0 million, except for the favourable trade balance of \$42.7 million shown by Massey-Ferguson Industries Limited.

Source: From D. Martinusen and B. P. Barry, *Revenues, Costs and Profits in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 11 (Ottawa: Information Canada, 1970), Table 5.2.

TABLE 12.28 – FINANCIAL STATISTICS – CANADIAN FARM MACHINERY FIRMS, 1960-66,  
GROUP I – THREE FIRMS (OF FOUR)  
(Thousands of Canadian dollars)

	1960	1961	1962	1963	1964	1965	1966
<b>Distribution assets</b>							
Wholesale notes receivable	79,623	84,297	81,477	68,072	66,946	75,636	101,856
Finished goods inventories	47,885	48,011	49,624	53,649	62,373	74,594	81,194
Total distribution assets	127,508	132,308	131,101	121,721	129,319	150,230	183,050
Retail notes receivable	26,865	26,408	39,579	51,874	71,126	94,564	102,954
<b>Factory assets</b>							
Raw material inventories	5,796	4,582	5,415	7,598	7,903	9,142	11,780
Work-in-process inventories	18,399	16,645	20,223	20,863	25,812	28,952	31,356
Net fixed assets	34,650	36,639	35,111	45,599	47,201	49,877	49,770
Total factory assets	58,845	57,866	60,749	74,060	80,916	87,971	92,906
Total assets	213,218	216,582	231,429	247,655	281,361	332,765	378,910
<b>Returns</b>							
Profit after tax	1,533	2,941	7,017	10,908	12,239	14,934	19,174
Income taxes	2,279	3,082	7,130	11,629	10,483	6,588	8,913
Profit before tax	3,812	6,023	14,147	22,537	22,722	21,522	28,087
Interest payments	6,933	6,476	6,194	6,214	6,464	8,557	10,393
Total returns	10,745	12,499	20,341	28,751	29,186	30,079	38,480
Return on assets (%)	5.0	5.8	8.8	11.6	10.4	9.0	10.2
<b>Net sales</b>							
Domestic wholesale sales	133,202	122,234	139,170	172,906	194,930	213,998	234,347
Export sales	76,780	70,998	75,497	90,516	108,620	116,244	153,249
Total net sales	209,982	193,232	214,667	263,422	303,550	336,242	387,596
Turnover of distribution assets ( <i>ratio of</i> domestic wholesale sales to distribution assets)	1.0	0.9	1.1	1.4	1.5	1.4	1.3

Source: From D. Martinusen and B. P. Barry, *Revenues, Costs and Profits in the Farm Machinery Industry*, Study No. 11 (Ottawa: Information Canada, 1970), Table D.1.



TABLE 12.29—FINANCIAL STATISTICS—CANADIAN FARM MACHINERY FIRMS, 1960-66,  
GROUP II—FIVE FIRMS (OF SIX)  
(Thousands of Canadian dollars)

	1960	1961	1962	1963	1964	1965	1966
<b>Distribution assets</b>							
Wholesale notes receivable	18,294	13,200	14,860	14,758	18,907	(24,121)	25,793
Finished goods inventories	14,234	14,288	14,888	13,620	13,049	13,264	17,603
Total distribution assets	32,528	27,488	29,748	28,378	31,956	37,385	43,396
Retail notes receivable	9,448	9,350	8,123	11,969	13,783	15,526	29,634
<b>Factory assets</b>							
Raw material inventories	—	—	—	—	—	—	—
Work-in-process inventories	—	—	—	—	—	—	—
Net fixed assets	2,265	2,573	2,866	2,615	2,560	2,717	2,878
Total factory assets	2,265	2,573	2,866	2,615	2,560	2,717	2,878
Total assets	44,241	39,411	40,737	42,962	48,299	55,628	75,908
<b>Returns</b>							
Profit/(loss) after tax	(4,646)	(4,001)	121	1,200	2,004	2,166	4,966
Income taxes	1,451	958	1,228	1,927	1,154	1,844	3,313
Profit/(loss) before tax	(3,195)	(3,043)	1,349	3,127	3,158	4,010	8,279
Interest payments	1,809	2,392	1,743	1,967	2,169	2,701	3,773
Total returns/(losses)	(1,386)	(651)	3,092	5,094	5,327	6,711	12,052
Return/(loss) on assets (%)	(3.1)	(1.7)	7.6	11.9	11.0	9.3	15.9
<b>Net sales</b>							
Domestic wholesale sales	36,564	36,663	40,770	56,094	60,310	72,626	90,856
Export sales	—	—	—	—	—	—	—
Total net sales	36,564	36,663	40,770	56,094	60,310	72,626	90,856
Turnover of distribution assets ( <i>ratio of</i> domestic wholesale sales to distribution assets)	1.1	1.3	1.4	2.0	1.9	1.9	2.1

Source: From D. Martinusen and B. P. Barry, *Revenues, Costs and Profits in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 11 (Ottawa: Information Canada, 1970), Table D.2.

TABLE 12.30 – FINANCIAL STATISTICS – CANADIAN FARM MACHINERY FIRMS, 1963-68,  
GROUP III – ONE FIRM  
(Thousands of Canadian dollars)

	1963	1964	1965	1966	1967	1968
<b>Distribution assets</b>						
Wholesale notes receivable	1,600	3,400	4,500	8,000	13,000	15,700
Finished goods inventories <sup>1</sup>	—	—	—	—	—	—
Total distribution assets	1,600	3,400	4,500	8,000	13,000	15,700
Retail notes receivable	—	—	—	—	—	—
<b>Factory assets</b>						
Raw material inventories	300	700	1,400	2,200	6,000	8,000
Work-in-process inventories	300	1,500	1,600	2,200	2,500	2,800
Net fixed assets	600	2,200	3,000	4,400	8,500	10,800
Total factory assets	2,200	5,600	7,500	12,400	21,500	26,500
<b>Returns</b>						
Profit after tax	900	1,200	1,400	2,200	2,800	1,600
Income taxes	—	1,300	1,400	2,400	2,900	1,700
Profit before tax	900	2,500	2,800	4,600	5,700	3,300
Interest payments	—	—	100	200	400	1,000
Total returns	900	2,500	2,900	4,800	6,100	4,300
Return on assets (%)	40.9	44.6	38.7	38.7	28.4	16.2
<b>Net sales</b>						
Domestic wholesale sales	5,300	5,200	6,700	11,300	15,900	13,400
Export sales	—	4,000	4,700	5,500	6,600	9,400
Total net sales	5,300	9,200	11,400	16,800	22,500	22,800
Turnover of distribution assets ( <i>ratio of domestic wholesale sales to distribution assets</i> )	3.3	2.7	2.5	2.1	1.7	1.5

<sup>1</sup>The published *Annual Reports* of Versatile Manufacturing Limited do not segregate inventories as between factory and distribution; factory inventories above therefore includes total inventories, including some finished goods inventories.

Source: From D. Martinusen and B.P. Barry, *Revenues, Costs and Profits in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 11 (Ottawa: Information Canada, 1970), Table D.3.

TABLE 12.31—FINANCIAL STATISTICS—CANADIAN FARM MACHINERY FIRMS, 1960-66,  
GROUP IV—THREE FIRMS  
(Thousands of Canadian dollars)

	1960	1961	1962	1963	1964	1965	1966
<b>Distribution assets</b>							
Wholesale notes receivable	243	355	328	497	486	622	799
Finished goods inventories	646	567	546	855	706	932	1,220
Total distribution assets	889	922	874	1,352	1,192	1,554	2,019
Retail notes receivable	—	—	—	—	—	—	—
<b>Factory assets</b>							
Raw material inventories	339	379	324	140	634	405	553
Work-in-process inventories	45	60	27	36	118	98	161
Net fixed assets	316	359	454	479	588	669	770
Total factory assets	700	798	805	655	1,340	1,172	1,484
Total assets	1,589	1,720	1,679	2,007	2,532	2,726	3,503
<b>Returns</b>							
Profit/(loss) after tax	(1)	93	356	480	425	484	459
Income taxes	23	57	277	233	139	265	272
Profit before tax	22	150	633	713	564	749	731
Interest payments	32	53	54	47	51	71	96
Total returns	54	203	687	760	615	820	827
Return on assets (%)	3.4	11.8	40.9	37.9	24.3	30.1	23.6
<b>Net sales</b>							
Domestic wholesale sales	2,499	2,645	3,666	4,308	4,770	5,571	6,748
Export sales	—	—	—	—	97	137	209
Total net sales	2,499	2,645	3,666	4,308	4,867	5,708	6,957
Turnover of distribution assets (ratio of domestic wholesale sales to distribution assets)	2.8	2.9	4.2	3.2	4.0	3.6	3.3

Source: From D. Martinusen and B. P. Barry, *Revenues, Costs and Profits in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 11 (Ottawa: Information Canada, 1970), Table D.4.

TABLE 12.32—EXAMPLES OF POSSIBLE PATTERNS OF DISTRIBUTION OF PROFITS EARNED ON SALES IN CANADA BETWEEN CANADA AND OTHER COUNTRIES

	Companies Selling Products Wholly Made or Assembled in Canada			Companies Selling Some Products Made Wholly in Canada; Some Products Made Wholly by Associated Companies Outside Canada			Companies Selling Products Wholly Made or Assembled by Associated Companies Outside Canada		
	(Example: Versatile)			(Examples: Massey-Ferguson, John Deere, International Harvester, Cockshutt)			(Examples: J. I. Case, Allis-Chalmers, Ford, New Holland, etc.)		
	Dealer-Customer Transaction	Company-Dealer Transaction	Manufacturing-Distribution Transaction	Dealer-Customer Transaction	Company-Dealer Transaction	Manufacturing-Distribution Transaction	Dealer-Customer Transaction	Company-Dealer Transaction	Manufacturing-Distribution Transaction
Value of sales at companies' suggested retail prices	100			100			100		
Value of sales to dealer at companies' net wholesale prices	(73)	73		(73)	73		(73)	73	
Dealer gross margin	<u>27</u>			<u>27</u>			<u>27</u>		
Cost of sales at transfer price from manufacturing to wholesaling division		61							61
Distribution gross margin		(61)	12		(61)	12		(61)	12
Distribution costs		(10)			(10)			(10)	
Company distribution profit		<u>2</u>			<u>2</u>			<u>2</u>	
Company manufacturing cost			(54)			(27.0)			(27.0)
Company manufacturing profit			<u>7</u>			<u>3.5</u>			<u>0</u>
Company profit visible in Canada			9			5.5			2
Total global company profit on sales in Canada			9			9			9

TABLE 12.33—GROUP I CANADIAN FARM MACHINERY COMPANIES, SALES, COSTS AND PROFITS, 1961-69  
(Thousands of Canadian dollars)

Group I (4 Companies)	1961 <sup>1</sup>	1962	1963	1964	1965	1966	1967	1968	1969
1. Net sales	193,232	239,988	306,342	353,595	390,334	455,082	451,922	364,904	358,903
2. <i>Cost of goods sold</i>	<i>158,984</i>	<i>192,013</i>	<i>246,943</i>	<i>292,406</i>	<i>325,866</i>	<i>375,750</i>	<i>378,478</i>	<i>313,780</i>	<i>317,854</i>
3. Gross profit	34,248	47,975	59,399	61,189	64,468	79,332	73,444	51,124	41,049
4. <i>Selling, general and admin. expenses</i>	<i>22,032</i>	<i>24,171</i>	<i>26,312</i>	<i>27,544</i>	<i>28,063</i>	<i>31,837</i>	<i>32,541</i>	<i>33,279</i>	<i>37,454</i>
5. <i>Other expenses</i>	<i>9,865</i>	<i>11,108</i>	<i>11,700</i>	<i>13,417</i>	<i>16,696</i>	<i>20,219</i>	<i>22,202</i>	<i>23,604</i>	<i>23,623</i>
6. <i>Total expenses</i>	<i>31,897</i>	<i>35,279</i>	<i>38,012</i>	<i>40,961</i>	<i>44,759</i>	<i>52,056</i>	<i>54,743</i>	<i>56,883</i>	<i>61,077</i>
7. Interest and other income	3,672	4,208	4,853	6,507	6,866	7,459	11,152	11,802	15,299
8. <i>Total expenses (net)</i>	<i>28,225</i>	<i>31,071</i>	<i>33,063</i>	<i>34,454</i>	<i>37,893</i>	<i>44,597</i>	<i>43,591</i>	<i>45,081</i>	<i>45,778</i>
9. Profit before tax/loss	6,023	16,904	26,336	26,735	26,575	34,735	29,853	6,043	4,729
10. <i>Taxes/credit</i>	<i>3,082</i>	<i>8,585</i>	<i>13,399</i>	<i>12,389</i>	<i>9,177</i>	<i>12,380</i>	<i>15,440</i>	<i>2,400</i>	<i>4,466</i>
11. Net profit/loss	2,941	8,319	12,937	14,346	17,398	22,355	14,413	3,643	263

Note: Italics indicate subtracted figures or (in lines 9 and 11) loss position.

<sup>1</sup> Three companies.

Source: General and Financial Information Questionnaire.

TABLE 12.34—GROUP II CANADIAN FARM MACHINERY COMPANIES, SALES, COSTS AND PROFITS, 1961-69  
(Thousands of Canadian dollars)

	1961	1962	1963	1964	1965	1966	1967	1968	1969
<b>Group II (5 companies)</b>									
1. Net sales	36,663	40,770	56,094	60,310	72,626	90,856	97,969	88,576	89,218
2. Cost of goods sold	30,589	31,408	43,010	46,494	56,387	68,318	78,426	69,244	69,189
3. Gross profit	6,074	9,362	13,084	13,816	16,239	22,538	19,543	19,332	20,029
4. Selling, general and admin. expenses	7,246	6,766	8,051	8,641	9,815	10,936	12,356	12,652	13,946
5. Other expenses	2,453	1,837	2,216	2,354	2,794	3,882	5,047	5,770	6,647
6. Total expenses	9,699	8,603	10,267	10,995	12,609	14,818	17,403	18,422	20,593
7. Interest and other income	583	590	311	338	381	560	986	1,128	1,354
8. Total expenses (net)	9,116	8,013	9,956	10,657	12,228	14,258	16,417	17,294	19,239
9. Profit before tax/loss	3,042	1,349	3,128	3,158	4,010	8,279	3,125	2,038	790
10. Taxes/credit	958	1,228	1,927	1,154	1,844	3,313	1,578	1,054	938
11. Net profit/loss	4,000	121	1,201	2,004	2,166	4,966	1,547	984	148

Note: Italics indicate subtracted figures or (in lines 9 and 11) loss position.  
Source: General and Financial Information Questionnaire.

TABLE 12.35—GROUP III, SALES, COSTS AND PROFITS OF VERSATILE MANUFACTURING, 1964-69  
(Thousands of Canadian dollars)

	1964	1965	1966	1967	1968	1969
Group III (1 company)						
1. Net sales	9,199	11,376	16,816	22,506	22,757	33,787
2. <i>Cost of goods sold</i>	6,368	7,998	11,443	15,638	17,586	30,001
3. Gross profit	2,831	3,378	5,373	6,868	5,171	3,786
4. <i>Selling, general and admin. expenses</i>	379	563	632	872	1,006	1,420
5. <i>Other expenses</i>	24	80	178	379	959	1,339
6. <i>Total expenses</i>	403	643	810	1,251	1,965	2,759
7. Interest and other income	113	54	57	74	93	111
8. <i>Total expenses (net)</i>	290	589	753	1,177	1,872	2,648
9. Profit before tax	2,541	2,789	4,620	5,691	3,299	1,138
10. <i>Taxes/credit</i>	1,303	1,411	2,368	2,882	1,699	587
11. Net profit	1,238	1,378	2,252	2,809	1,600	551

Note: Italics indicate subtracted figures.  
Source: *Annual Reports* of company.

TABLE 12.36—GROUP IV CANADIAN FARM MACHINERY COMPANIES, SALES, COSTS AND PROFITS, 1961-69  
(Thousands of Canadian dollars)

Group IV (3-4 companies)	1961 <sup>1</sup>	1962 <sup>1</sup>	1963 <sup>1</sup>	1964 <sup>1</sup>	1965 <sup>1</sup>	1966 <sup>1</sup>	1967 <sup>2</sup>	1968 <sup>2</sup>	1969 <sup>2</sup>
1. Net sales	1,914	3,185	3,936	4,726	6,219	7,594	7,729	8,838	9,169
2. <i>Cost of goods sold</i>	1,356	2,129	2,787	3,487	4,338	5,496	5,665	6,362	7,136
3. Gross profit	558	1,056	1,149	1,239	1,881	2,098	2,064	2,476	2,033
4. <i>Selling, general and admin. expenses</i>	355	381	470	812	813	990	874	956	1,112
5. <i>Other expenses</i>	99	95	102	115	177	238	95	112	161
6. <i>Total expenses</i>	454	476	572	927	990	1,228	969	1,068	1,273
7. Interest and other income	7	11	18	13	14	35	36	20	113
8. <i>Total expenses (net)</i>	447	465	554	914	976	1,193	933	1,048	1,160
9. Profit before tax	111	591	595	325	905	905	1,131	1,428	873
10. <i>Taxes/credit</i>	62	267	241	160	426	448	332	562	374
11. Net profit	49	324	354	165	479	457	799	866	499

Note: Italics indicate subtracted figures.

<sup>1</sup> Four companies.

<sup>2</sup> Three companies.

Source: General and Financial Information Questionnaire.



## **Chapter 13**

### **EVALUATION OF THE INDUSTRY'S PERFORMANCE**

The conclusions reached in this section of the Commission's Report can be summarized under three major headings: (1) structure of the market, (2) competitive behaviour and performance of the industry, and (3) recommendations.

#### **Structure of the Market**

Characteristics of the industry on both the demand and cost side have discouraged the entry of new firms and contributed to the high level of concentration that exists for many products.

On the demand side, the highly seasonal nature of sales and their erratic year-to-year fluctuations have favoured the growth of the large international company which can sell in a number of different market areas and thus achieve a more uniform sales level. This levelling-out of sales and production provides the larger firm with lower costs than can be achieved by the small firm selling in a single market. The comparatively slow longer-term growth in demand for farm machinery has had a similar effect.

Because many farm machines are complex durable products, whose timing in use is often critical, provision for service and the supply of repair parts is an essential component in the successful sale of farm machinery. The major companies all maintain their own branch-house distribution systems and sell their products through franchised dealers whose operations are closely supervised. The companies support their dealers in many ways, through special training programs for dealer personnel, by managerial advice, by the provision of service manuals and advertising material, and most important of all by providing a stock of their machines on an interest-free floor-planning basis. Since dealers are discouraged from handling the competitive products of other companies, any new entrant to the industry faces a major barrier in the form of the cost and effort required to develop a distribution network. Sales through independent wholesalers tend to be limited to less complex products where provision for emergency repair parts service is not important. In recent years, too, company finance plans, which allow the franchised dealer to sell to the farmer on credit, have been used to support the competitive position of the major companies.

On the cost side, the importance of economies of scale for tractors, combines, and other products, has made it difficult for the smaller firms to compete effectively with the largest firms in the industry. For tractors, manufacturing costs per unit decline about 20 per cent as output increases from 20,000 tractors a year to 90,000. As a result, a factory price that will yield a plant producing 20,000 tractors a year a return of about 12 per cent on invested capital will provide a return of about 33 per cent for a 60,000-tractor plant and 45 per cent for a 90,000-unit plant. Data for combines are less precise but here, too, economies of scale appear substantial. For a plant producing only 5,000 combines a year, unit manufacturing costs are estimated to be 15 per cent higher than they are at 20,000-units per year. Firms producing tractors and combines along with other farm machines may gain some of the economies that go with larger-volume production by producing components for different machines at one location. Rough estimates indicate that economies of scale are also important for activities beyond the plant level—activities such as research, financing, and wholesale distribution. These economies relate to the total firm size rather than to the production volume of a single product line. Costs may decline by 20 per cent or more as sales increase from \$100 million to \$450 million annually.

Thus, at both the plant and firm level, economies of scale are a significant barrier to the entry of new firms. Three plants of an efficient size could supply all of North America's current annual requirement for wheeled tractors. Two or three plants could produce all the combines that are sold annually.

These barriers to the entry of new firms have contributed to the high degree of concentration that exists for many of the industry's major products. The four leading firms in the industry account for 67 per cent of tractor sales in Canada, 69 per cent of combine sales, and 69 per cent of the sales of haying equipment. A similar level of concentration exists in the United States.

Although barriers to entry are substantial, this has not prevented new firms from entering. Indeed, the share of the Big Three—International Harvester, John Deere, and Massey-Ferguson—has fallen in almost every major product line over the past decade in the Canadian market. This has been due partly to the fact that the major firms have maintained prices at levels high enough to attract new entrants or allow smaller firms to expand in spite of the barriers that exist. The high prices are evident in the much larger returns that can be earned on invested capital at higher volumes of output. However, the result has not always shown up as high profits. There is some evidence that the major firms have not fully utilized the economies of scale that are potentially available. Barriers to entry can protect inefficiency and high costs of production as well as high profits.

Some further support for this thesis is provided by evidence presented in the Commission's *Special Report on Prices*. This evidence showed that profit margins were particularly large on the higher-horsepower tractors. And this is the sector of the market where the share of the Big Three has been declining. Some of this

decline reflects the success with which different firms have developed and marketed their larger-horsepower models. But it has been the existence of high prices in this sector of the market that has permitted the smaller firms the success they have enjoyed.

### Competitive Behaviour

Where major companies account for a significant share of the market, they avoid price competition for fear of provoking retaliation, which would produce lower profits for all concerned. Major firms instead concentrate on various forms of non-price competition such as the development of improved products, an increased number of sizes, options, and models for each major product line, better sales promotion through improved dealer organization, better repair parts service, more emphasis on quality reflected in improved warranty provisions, and extension of customer credit. Smaller firms are likely to place more emphasis on price competition, since the effects of their price cuts on the sales of any one firm are smaller and less likely to produce counteraction. Consider the evidence in each of these areas.

*Price Competition* — One evidence of the policy of price restraint in price competition pursued by the major firms in North America has been the high expected rates of return to investment in new manufacturing facilities, especially in the case of higher-horsepower tractors where the market has been growing rapidly. Using data provided by its special study on *Farm Tractor Production Costs* the Commission estimates that 90 HP tractor prices prevailing in Canada in 1967 would yield a before-tax return on manufacturing assets of 49 per cent in a plant producing 60,000 tractors a year, and 61 per cent in a plant producing 90,000 tractors. For 130 HP tractors these returns increase to 76 and 92 per cent, respectively. Even a plant producing only 20,000 tractors a year would earn a return of 26 per cent on its 90 HP models and 48 per cent on its largest models. North American producers at all three levels of production would suffer losses on 40 HP tractors. The tractors in the latter size range which are sold in Canada are mainly imported from Western Europe. However, as was documented at length in the Commission's *Special Report on Prices*, these smaller tractors (those below 65 HP) have been sold in Canada at very much higher prices than in England or a number of other European countries. In the 1968 selling season, the net wholesale price to dealers on these tractors ranged from 30 to 45 per cent higher in Canada than in Britain. The companies have been able to maintain these price differences—despite an absence of tariffs on imports into Canada—by exercising tight control over the sale of tractors for export in Britain.

For North America it seems clear that Deere is the price leader for tractors and other major farm machines, and it has evidently set a price which has not only enabled it to earn a high return on its tractor manufacturing assets but has also allowed the smaller firms to survive. Economies of scale are important for combines, too, and the survival of smaller-scale manufacturing operations for

combines suggest that here, also, the major firms establish prices that will yield high returns on invested capital at larger volumes of output.

An examination of tractor prices in different Western European countries indicates that the major international companies establish prices in each country to meet local competitive conditions. As a result, the price differences between countries often exceed the tariff and transport costs that separate these markets.

*Non-Price Competition* — Product improvement has long been a major characteristic of competition in the farm machinery industry. As demonstrated elsewhere in this Report (see Chapter 17), it is a form of competition that has yielded very large benefits to society generally in the form of lower production costs in agriculture. In the past, these improvements have derived from many sources—from inventions by farmers, from the inventive genius of individuals like Harry Ferguson, from the research carried on by the machinery companies, and from ideas adapted from other industries.<sup>1</sup> Today, however, the R&D expenditures of the major companies are very large in absolute terms (Deere alone spends more than \$45 million a year) and are likely to be a major source of improvements in the future. Unless the smaller companies are supported by a larger public expenditure of funds in this area, they are likely to face increasing difficulty in competing effectively with the industry's giants. New product developments and improvements on older products are a particularly effective form of competition because they may offer the farmer a cost reduction that will outweigh any compensating price reduction that firms with unimproved products can afford to make. Other firms must improve their products too, if they are to stay alive. Product improvements have often caused dramatic shifts in market shares for individual products in the past. Today, with all the larger firms engaged in continuous programs of product improvement involving substantial expenditures, these shifts are likely to be less frequent and less dramatic.

Not all of the R&D expenditures result in genuine benefits. In recent years, there has been an increasing emphasis in the industry on new models and on providing a greater range of sizes and options from which the farmer can choose. In an industry where output volume is often too small to yield individual firms the full benefit of the lower costs that go with large-scale production, this emphasis on more options, sizes, and models has further fragmented production and added to the underlying cost of farm machinery. It is a kind of development that is only possible in an industry where price competition is under restraint.

*Retail Distribution* — All the full- and long-line companies place a major emphasis on organizing and developing a network of dealers to distribute their products. Farmers, of course, have an important interest in having ready access to farm machinery dealers who can give them advice on their new machinery purchases, provide them with prompt and efficient service when their machinery

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<sup>1</sup>A.G. Vicas, *Research and Development in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 7 (Ottawa: Queen's Printer, 1970).

needs repair, and look after their warranty and other needs. Thus in this area the interests of the farmer and the farm machinery companies are often identical. However, unlike some other suppliers of farm products, the machinery companies have done little to develop a machinery advisory service capable of giving the farmer competent advice on machine capacity and replacement, and on other technical aspects of the farmer's investment decision (see Chapter 25).

To the machinery companies, the dealer network is a major component of their sales effort. Sales quotas are worked out for dealers and they are encouraged to carry large inventories of the company's machines on their premises. The sale of competitive products of rival firms may not be actually forbidden, but it is actively discouraged. Dealer sales activities are closely supervised by company representatives who may even assist in making sales.

### **Performance**

An evaluation of an industry's performance is primarily concerned with its efficiency and its progressiveness over time. Efficiency will be reflected in production costs, the price of its products and its profit level. Progressiveness will be reflected both in improvement of the industry's final product and in the productivity gains achieved by the industry over time. Consideration will be given to both manufacturing and distribution.

*Efficiency* — At the manufacturing level, there is evidence that the industry does not fully utilize the economies available from large-scale manufacturing. One estimate prepared for the Commission shows that North American tractor production costs would be reduced by about 8 per cent if tractor production were concentrated in a smaller number of larger plants. This would reduce the price of an average-sized tractor at the factory level by about \$400. Similar savings may be available for combines and some other products. Examination of the existing structure of plants in the industry suggests that other kinds of inefficiency may also exist in this industry. Plants representing older technologies—with layouts that are poor by current standards, with high costs for handling materials, and lower over-all productivity—have survived in the industry. At least in part, this survival has been possible because prices have been kept at levels that are high in relation to manufacturing costs in a new plant of an optimum size.

On the other hand, some sectors of the industry have redeployed their resources more efficiently on an international basis. Many of the newer tractor plants constructed by the industry have been in Western Europe, where manufacturing costs are substantially lower. The Commission has estimated that, in 1968, manufacturing costs for tractors in Britain were about 25 per cent lower than in the United States at the same output volume. However, the benefits of these lower costs have been passed on to consumers in North America only to a very limited extent. The major portion of the tractors supplied to North American farmers are still manufactured on this continent. And those that are imported are sold at higher prices than in Western Europe.

For combines there is also a small importation from lower-cost sources in Belgium and Germany. However, even within Western Europe production by some of the major companies such as Massey-Ferguson is fragmented among different plants. The result must be higher costs than a more efficient structure of plants would make possible. However, the bulkiness and high cost of shipping combines make it unlikely that large-scale imports of combines into North America will develop.

At the dealer level, the industry has moved a long way towards a more efficient organization of resources. Most farm machinery is sold by dealers who have reached a reasonably efficient size. While many smaller dealerships remain, their total sales are small. Moreover, small dealers may be inevitable in sparsely settled areas. Thus, the potential gain that could be made by concentrating farm machinery sales into fewer and larger dealerships is probably negligible.

In contrast, at the wholesale distribution levels there are still significant savings that could be made. Some of these reflect savings that could be made in the costs of dealer supervision if the companies concentrated their sales into a smaller number of larger dealers. However, the reduction in dealer numbers has been proceeding apace, and some of the potential saving may already have occurred. There is also reason to believe that the practice of floor-planning new machinery on an interest-free basis adds unnecessarily to the cost of distributing farm machinery. The major companies may find the practice useful as a device to keep their machines on view near the farmer and to avoid a loss of sales from temporary shortages, but the extra cost resulting from the practice must be absorbed by the farmer.

Profit levels fluctuate rather widely in the farm machinery industry. However, on the average, profit levels have been moderate compared with those earned by other manufacturing industries. Between 1948 and 1957, the industry in the United States earned an estimated average rate of return, after taxes, of 4.6 per cent on total assets compared with 5.0 per cent in all manufacturing. Between 1958 and 1965, the comparable returns were 4.8 per cent and 6.2 per cent respectively. The comparatively low profit levels and the small increase between the two periods in relation to total manufacturing industry are partly due to the industry's failure to take full advantage of economies of scale. Moreover, the moderate over-all returns may include high profits on tractors and combines and much lower profits on other products. Profit rates are also affected by the very large distribution assets carried by the industry, either directly as inventory or indirectly in the form of accounts receivable from their dealers and farmer customers.

Profit rates have varied substantially among the companies, but are now significantly lower than they were before the Second World War. Deere has been consistently able to earn a much higher rate of return than other firms in the industry. Profits have been low for some of the smaller firms, such as Case, and the firms later acquired by White Motor (Oliver, Cockshutt, and Minneapolis-Moline).

In general, the evidence is consistent with the hypothesis that the leading firms in the industry have maintained prices that are high in relation to the costs of a large-volume operation, and this has permitted the smaller firms to survive.

*Technological Progress* — As mentioned above, R&D expenditures in the industry are large and have increased significantly over the past few decades. The resulting improvement in farm machinery has contributed to a very large reduction in labour requirements in agriculture. As farm machinery has steadily become larger, more complex, and more sophisticated, the introduction of significant improvements has become increasingly dependent on the expenditures of large companies. Many new developments in the past originated with the ideas of individual farmers. This still occurs. And companies of modest size often make important contributions. But the balance of advantage appears to be swinging to the major R&D establishments maintained by the larger companies.

Although the contributions of the industry have been large and important, it is not easy to evaluate them against a scale of what they *could* have done. If the major companies are open to criticism, it is in respect to their slowness in moving into more basic types of research. But in this area the efforts of our universities and governments have been sadly deficient as well.

Although precise evidence is lacking, it is the Commissioner's view that the industry has greatly improved the quality of its products over the past few decades. Warranties are now available on most if not all farm machines, and over time they have been improved and extended. All the major companies have both laboratory facilities, in which they carry out extensive tests on the materials and components that go into their machines, and test facilities for their final machines. Failures still occur, and there is room for further improvement, but substantial progress has been made.<sup>2</sup>

In concluding this evaluation of the industry's performance it will be useful to consider briefly the direction in which it would seem desirable for the industry to move. Would the farm machinery industry be better able to supply the farmer with a quality product at reasonable prices and maintain a continuous flow of improvements if, like the automobile industry, there were just three or four full-line firms in the industry instead of eight or nine? It is clear from the evidence presented in this Report that a number of the full-line firms selling farm machinery today do not have enough sales volume on tractors, combines, and other major products, to achieve adequate economies of scale. As a result, their production costs on many products are from 10 to 20 per cent higher than they need be. Even some of the largest firms such as Deere and International Harvester do not have a sales volume on tractors and combines that gives them the full advantage of large-scale production.

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<sup>2</sup> G. F. Donaldson, *Farm Machinery Testing*, Royal Commission on Farm Machinery, Study No. 8 (Ottawa: Queen's Printer, 1970).

On the other hand, unlike the automobile industry, the farm machinery industry produces a very diverse range of products. The industry structure that would achieve the maximum economies of scale on tractors may not be suitable for tillage equipment or other machines. Moreover, there is some evidence that important innovations often come from smaller firms. Toynbee has argued that world history affords many instances where a challenge, provided it is not too severe, produces a response. The smaller firm, which is under more severe competitive pressure, may well be the one that responds to the challenge of potential innovation.

A solution providing more of the economies of scale that come from larger-volume production, yet not sacrificing the variety and competitive challenge that accompany eight or nine rather than three or four full-line firms, is for more integration on an international basis. If firms such as Case, Allis-Chalmers, and White Motor, whose annual tractor sales are 20,000 or less, were to develop working arrangements with some of the smaller independent European firms such as David Brown, Renault, or Fiat, it might be possible to achieve a production volume that would give them many more scale economies than they now obtain. They would also obtain some of the benefit that accrues under present exchange-rate levels from lower-cost European production. Major firms like Deere and International Harvester as well might be able to reduce their costs significantly by a greater integration of their tractor production on an international basis. Some of these same benefits might be attained on combines and other major products as well. In some measure, the industry has been moving in this direction. But there is clearly room for further international integration of the industry.

### **Recommendations**

The following recommendations are designed to make the farm machinery industry adopt policies oriented more towards lower costs and lower prices. Lower manufacturing costs could be achieved through larger-volume production in individual plants. Lower distribution costs could be achieved if there were less emphasis on selling methods that result in large inventories of finished machines in the hands of the dealer. Some reduction in wholesale distribution costs could also be obtained by a further rationalization of the dealer distribution networks to eliminate the very small dealers, who account for a disproportionate share of branch-house distribution costs. If lower manufacturing costs were to be obtained on the basis of the North American market alone, it would undoubtedly involve some reduction in the number of firms now selling on a full-line basis in the Canadian market. However, such a reduction may be avoided if the smaller North American firms can integrate their manufacturing operations for tractors and other major products with those of the larger independent manufacturers in Western Europe.

Because Canada is just one segment of the large North American market, with many of the farm machines sold in Canada being manufactured in the United States



and a major part of Canadian production being sold outside Canada, it is not easy to devise measures that will have substantial effects. Nevertheless, the following measures should be influential in making the Canadian market more competitive. They would clearly be more effective if the U.S. government were to adopt similar measures.

(1) The government should prohibit the floor-planning of new and used farm machines on an interest-free basis in the hands of the dealers. To be effective this measure would need to be supported by a ban on consignment selling, and a provision for minimum interest rates on sales to dealers on a credit basis. Such a measure would force dealers to give more consideration to the interest cost of the inventory they hold, and should make it easier for short-line firms to compete with the established long-line firms at the distribution level. The rationale of this measure and some suggestions for its gradual implementation are elaborated in Chapter 11.

(2) Some steps should be taken to increase the availability of financing to farm machinery dealers. In particular it is recommended that an Act which provides for insurance of the risk on loans to dealers, somewhat comparable to that currently provided for farmers under the Farm Improvement Loans Act, should be instituted. The Industrial Development Bank should also assume a more active role in providing loans to dealers. Loans should be restricted to dealers who have already reached—or have a good prospect of reaching—an efficient size.

(3) Agreements that require dealers to handle only machines of the company in question, known as exclusive-dealing agreements, should be made illegal, as is already the case in the United States.

(4) Mergers that are likely to significantly lessen competition in the farm machinery industry should be prohibited, unless it can be shown that they have important cost-saving effects. In the latter case, they might be allowed if there is reasonable assurance that the cost-saving effects would be passed on, in substantial measure, to the farmer.

(5) The Canadian government should explore, with appropriate U.S. authority, the possibility of the United States, too, enforcing a ban on interest-free floor-planning, supported by whatever steps are needed to ensure the availability of adequate credit for farm machinery dealers.

(6) In any future revision of the Farm Improvement Loans Act adequate consideration should be given to the role that this Act has played in making the farm machinery industry in Canada more competitive. The availability of finance under this legislation has undoubtedly facilitated the growth of Versatile, C.C.I.L., and a number of short-line firms. It is important that funds for the finance of new purchases of farm machinery be readily available through the chartered banks and other financial institutions, and that these institutions have an incentive to compete actively for this business.

(7) It is recommended to the various farm organizations that they take steps to make sure their members are fully aware of the cost savings of which they can take advantage by financing through the Farm Improvement Loans Act rather than under the finance plans provided by the major companies.

(8) While the sale of farm machinery on an interest-free basis outside the normal season of use plays a useful and desirable role in the industry, the same is not true of the sale of farm machinery on an interest-free basis during the normal selling season. A ban should be placed on in-season interest-free sales to farmers. In addition, the Farm Improvement Loans Act should be revised to make it clear that farmers who buy new machinery on an interest-free out-of-season basis can finance their machines under the Act when the interest-free period ends.

(9) When the Ontario Federation of Agriculture was attempting to import tractors from Britain, its Director of Marketing and Research, Mr. David Crone, was at one time warned by a solicitor for Ford Motor Company of Canada Limited that, in importing Ford tractors, they might be violating the law by using Ford's English trade mark in Canada.<sup>3</sup> The Commission understands that Canadian trade mark legislation allows a company to cut off any trade in products bearing its trade mark, or the mark of which it is the registered holder in Canada. Clearly, it is not in Canada's interest to allow a company to use a trade mark to create artificial barriers to trade. The Economic Council of Canada is currently examining the use of trade marks and will undoubtedly be making some recommendations in this area. The experience cited above supports the view that present legislation needs a thorough revision.

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<sup>3</sup>Royal Commission on Farm Machinery, *Special Report on Prices of Tractors and Combines in Canada and Other Countries* (Ottawa: Queen's Printer, 1969), p. 209.

### **PART III**

#### **COMPETITIVE POSITION OF THE INDUSTRY IN THE NORTH AMERICAN AND WORLD MARKET**

## Chapter 14

### THE PATTERN OF WORLD TRADE IN FARM MACHINERY

In 1966, trade in farm machinery, as measured by the value of exports, amounted to just under \$1,900 million. Of this total, about 54 per cent is accounted for by tractors, an additional 30 per cent by harvesting and haying equipment, 10 per cent by cultivating machines, and the balance by dairy and other equipment. Almost 80 per cent of this trade takes place between the advanced industrial countries, namely the United States, Canada, the western European nations, Australia, New Zealand, South Africa, and Japan. However, there are also substantial exports to the developing areas which in 1966 amounted to about \$400 million.<sup>1</sup>

As Tables 14.1, 14.2, and 14.3 indicate, four countries—the United States, Britain, West Germany, and Canada—have accounted for a very large proportion of total exports of farm machinery throughout the postwar period. However, their share has declined from 90 per cent in 1958 to 75 per cent in 1966. Of these four, the United States is by far the dominant exporting country, accounting in 1966 for about one-third of total exports of farm machinery and 38 per cent of the exports of tractors. Britain is a strong second and in recent years has accounted for about 21 per cent of the total and about 30 per cent of total tractor exports. Over the postwar period as a whole, there is some evidence that North America's share in the world farm machinery market has been declining, whereas the share held by Western Europe has been growing. Exports from Canada and the United States amounted to almost 60 per cent of the total exports in 1952, but by 1966 had fallen to 42 per cent.

In contrast, three smaller countries—Belgium, Denmark, and The Netherlands—have increased their share of the market from 1.0 per cent in 1952 to 7.3 per cent in 1966. The growth in Belgium's share, from 0.8 per cent in 1958 to 4.6 per cent in 1966, has been particularly striking, and undoubtedly reflects exports from the

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<sup>1</sup>These totals do not include trade among countries in the Communist bloc, since few accurate data are available on this trade. In addition, these totals probably overstate total trade in farm machinery and the share of tractors in this total, because the Standard International Trade Classification, from which these data are drawn, groups all tractors together. Thus the totals include heavy-duty construction tractors as well as agricultural tractors.

TABLE 14.1—EXPORTS OF FARM MACHINERY, FROM MAJOR EXPORTING COUNTRIES, 1952, 1958, 1964, AND 1966

	1952		1958		1964		1966	
	Millions of U.S. Dollars	Percentage	Millions of U.S. Dollars	Percentage	Millions of U.S. Dollars	Percentage	Millions of U.S. Dollars	Percentage
All Farm Machinery	908.2	100.0	1,048.6	100.0	1,640.5	100.0	1,894.1	100.0
25 Major countries								
10 Leading countries (in order of 1966 volume)								
United States	430.2	47.4	433.8	41.4	619.9	37.7	628.5	33.2
Britain	185.8	20.4	262.6	25.0	377.7	23.1	397.4	21.0
West Germany	97.3	10.7	140.6	13.4	209.3	12.7	224.5	11.9
Canada	112.6	12.4	109.8	10.5	137.9	8.4	160.8	8.5
France	27.1	3.0	26.0	2.5	71.3	4.3	93.2	4.9
Belgium-Luxembourg	2.6	0.3	7.9	0.8	38.7	2.4	86.4	4.6
Italy	16.9	1.9	14.6	1.4	45.3	2.8	81.4	4.3
Sweden	18.8	2.1	23.6	2.3	44.8	2.7	48.9	2.6
Denmark	5.1	0.6	12.0	1.1	24.4	1.5	29.3	1.5
The Netherlands	1.0	0.1	3.8	0.4	19.6	1.2	24.1	1.2
Farm Machinery, Excluding Tractors								
25 Major countries	377.9	100.0	391.6	100.0	765.8	100.0	865.7	100.0
10 Leading countries (in order of 1966 volume)								
United States	140.8	37.2	123.1	31.4	225.6	29.4	213.3	24.6
Canada	98.6	26.1	98.0	25.0	123.9	16.2	153.0	17.7
West Germany	32.9	8.7	61.3	15.7	142.3	18.6	144.7	16.7
Britain	59.5	15.7	47.0	12.0	82.0	10.7	85.1	9.8
Belgium-Luxembourg	2.4	0.6	7.6	1.9	38.5	5.0	48.0	5.5
France	14.7	3.9	11.2	2.9	37.7	4.9	45.3	5.2
Sweden	15.4	4.1	15.8	4.0	30.1	3.9	33.3	3.8
Denmark	5.1	1.3	11.8	3.0	23.9	3.1	29.0	3.3
The Netherlands	0.9	0.2	3.6	0.9	18.6	2.4	23.3	2.7
Italy	1.8	0.5	3.9	1.0	9.0	1.2	21.8	2.5

Tractors									
25 Major countries		530.3	100.0	657.0	100.0	874.7	100.0	1,028.4	100.0
8 Leading countries (in order of 1966 volume)									
United States		289.4	54.5	310.7	47.4	394.4	45.2	395.1	38.4
Britain		126.3	23.4	215.6	32.8	295.7	33.8	312.3	30.4
West Germany		47.1	8.9	79.3	12.1	67.0	7.7	79.8	7.8
Italy		14.9	2.8	10.7	1.6	36.2	4.1	59.6	5.8
France		14.6	2.8	14.8	2.3	33.6	3.8	47.9	4.7
Belgium-Luxembourg		0.2	—	0.3	—	0.2	—	38.4	3.7
Sweden		2.9	0.5	7.8	1.2	14.7	1.7	15.6	1.5
Canada		14.0	2.6	11.8	1.8	14.0	1.6	7.8	0.8

Note: Data for the United States for 1964 were readjusted for comparability with 1966 on the basis of data given in the *U.N. Yearbook of International Trade Statistics, 1966*. The change involved a reduction in agricultural tractor exports from \$520.8 million to \$394.4 million following a new classification introduced in 1965. Hence data for these two years are not fully comparable with earlier years. The extent to which tractor exports are distorted by the inclusion of construction-type tractors is indicated by the fact that in 1964 only \$188 million of the U.S. total tractor and parts exports were for wheel-type tractors (see U.S. Trade Statistics) and some of these would be industrial tractors.

Source: United Nations, *Commodity Trade Statistics*.

new Ford plant at Antwerp, together with increased exports from the Clayson combine plant after its takeover by New Holland. Italy's share also has been growing rapidly, having risen from 1.4 per cent in 1958 to 4.3 per cent in 1966. The export of Fiat tractors has been a significant element in this growth.

#### Decline in Canadian-U.S. Share of Non-Tractor Market

In the non-tractor market, the decline in the Canadian-U.S. share has been even more marked than for exports as a whole, having fallen from 63.3 per cent in 1952 to 42.3 per cent in 1966. Britain has also lost ground in this market area, its share having fallen from 15.7 per cent in 1952 to 9.8 per cent in 1966. Major gains in market shares were registered by West Germany with an increase from 8.7 per cent in 1952 to 16.7 per cent in 1966, and by the three smaller countries mentioned above—Belgium, Denmark, and The Netherlands. Their share of this market increased from 2.1 per cent in 1952 to 11.5 per cent in 1966.

TABLE 14.2—WORLD IMPORTS OF FARM MACHINERY, 1966  
(Millions of U.S. dollars)

	All Farm Machinery	Tractors: Non-Road	All Other Farm Machinery
Canada	337.3	179.3	157.9
United States	187.4	31.2	156.2
European Economic Community <sup>1</sup>	410.4	187.7	222.7
European Free Trade Association <sup>1</sup>	224.1	98.4	125.7
Other Western Europe	166.0	95.6	70.4
Australia and New Zealand	85.8	67.6	18.2
Japan	15.9	10.6	5.4
Other Asia	88.2	74.9	13.3
Middle East	63.8	44.4	19.4
South Africa	51.0	41.0	10.0
Other Africa	70.4	53.2	17.2
Latin America	158.1	112.4	45.7
Eastern Europe <sup>2</sup>	15.8	2.1	13.7
All other	20.0	14.3	5.7
Total imports	1,894.1	1,012.9	881.3

Note: Data are taken from exports as reported by country of origin.

<sup>1</sup>Includes internal trade within this group of countries.

<sup>2</sup>Imports by eastern European countries exclude trade within this group of countries.

Source: United Nations, *Commodity Trade Statistics*.

There is also some reason to believe that North America has lost some ground in the world market for tractors, especially in the smaller-horsepower sizes. Many of the major North American producers have either acquired production facilities for tractors in Western Europe, or have made arrangements to purchase tractors for sale

under their own brand name from an independent European firm. This development will be discussed more fully below. The data in Table 14.1 do not fully disclose this trend, but they do show a decline in the U.S. share of world tractor exports from 45 per cent in 1964 to 38 per cent in 1966.

On the import side, it is clear that Canada is by far the largest single importer of farm machinery, with imports in 1966 in excess of \$300 million. Measured by the total value of imports, Canada is followed in order of importance by the United States, France, and Australia. Over 40 per cent of total imports of farm machinery in 1966 was accounted for by the countries of Western Europe, with the Common Market countries importing about 21.7 per cent of the world total, the European Free Trade Association (EFTA) countries an additional 12 per cent, and the balance of Western Europe about 9 per cent (Table 14.2).

*Interregional World Trade Patterns* – Some data on the interregional pattern of world trade is given in Table 14.3. The largest *net* exporter of farm machinery is the United States with a balance-of-trade surplus of \$441 million in 1966. However, some 80 per cent of this surplus is due to the United States' net export position on tractors alone, and a substantial part of this surplus reflects her exports of tracklaying tractors, many of which are used for construction and other purposes. When tractors are excluded, the U.S. net export position for 1966 was only about \$70 million. In terms of the size of the farm machinery trade surplus, the United States is followed by the EFTA countries which had a surplus of some \$224 million in 1966. Britain was by far the major exporter in this group with exports in 1966 of \$397 million, all but \$85 million of which were tractors. Britain's rise to importance in the tractor export picture has been largely a postwar phenomenon and reflects the major production facilities of Ford and Massey-Ferguson. David Brown and British Leyland also have significant exports. Next to Britain in importance in the EFTA group is Sweden with exports of \$49 million in 1966. Volvo tractors and combines and Alfa-Laval dairying equipment are the major Swedish exports. For her size, Denmark is also a significant exporter and in 1966 she exported \$29 million worth of farm machinery.

The Common Market (EEC) countries, as a group, rank after the United States in terms of total exports, with over \$500 million in 1966. However, more than half of the total EEC exports are to other members of that group, and the Common Market's over-all trade surplus in 1966 was just \$100 million. Germany, with exports of \$224 million was the leader in this group, followed by France with \$93 million, Belgium with \$86 million, and Italy with \$81 million. As discussed below, the growth of the Common Market exports reflects both the location of farm machinery manufacture in that area by a number of the major international companies, and the growth of strong domestic manufacturers such as Deutz and Claas in Germany and Fiat in Italy.



TABLE 14.3—WORLD EXPORTS OF AGRICULTURAL MACHINERY, BY REGION OR COUNTRY AND BY MACHINERY TYPE,  
AND BALANCE OF TRADE, 1966  
(Millions of U.S. dollars)

Destination	Region or Country of Origin					
	Total	Canada	U.S.A.	EEC	EFTA	Other Western Europe
						Japan
						Eastern Europe
Total	1,894	161	628	510	497	25
Canada	337	—	308	12	17	—
United States	187	151	—	14	21	—
European Economic Community <sup>1</sup>	410	2	39	270	89	1
European Free Trade Association <sup>1</sup>	224	2	21	90	105	3
Other Western Europe <sup>2</sup>	166	—	18	56	78	—
Australia and New Zealand	86	2	27	8	42	—
Japan	16	—	7	2	6	—
Other Asia	88	—	29	6	23	5
Middle East	64	1	27	10	21	1
South Africa	51	—	11	6	32	—
Other Africa	70	—	24	21	21	—
Latin America	158	3	108	12	31	4
Eastern Europe <sup>3</sup>	16	—	1	3	5	6
All other	20	—	9	1	6	0
Total by type of machinery <sup>4</sup> (S.I.T.C. subgroups)						
712.1 Cultivating machinery	190	36	51	41	43	7
712.2 Harvesting machinery	560	114	141	211	83	4
712.3 Dairy machinery	44	1	6	12	23	—
712.5 Tractors	1,028	8	395	227	334	12
712.9 Other agricultural machinery	72	1	34	19	14	1
Balance of trade	—	-177	441	100	274	-141

<sup>1</sup> Includes internal trade (exports) within this group of countries, taken as original EEC (6) and EFTA (7) member countries.

<sup>2</sup> Other Western Europe consists of Yugoslavia, Iceland, Ireland, Greece, Turkey, Spain, and Finland.

<sup>3</sup> Eastern Europe includes all European countries not otherwise covered. Data on trade between eastern European countries are not available.

<sup>4</sup> Totals of subgroups may not add to total because of rounding.

<sup>5</sup> Tractors include industrial and construction tractors as well as farm tractors.

Source: United Nations, *Commodity Trade Statistics*.

*Net Import Position: Canada and Other Countries* — The major net importers of farm machinery—listed in order of their trade deficit on farm machinery in 1966— are Canada with a deficit of \$177 million, the Latin American Republics as a group with \$158 million, other Western Europe countries not included in the EEC and EFTA totals in Table 14.3 (Spain, Greece, Turkey, Yugoslavia, Finland, Iceland, and Ireland) with \$141 million, other Asia with \$84 million, Australia and New Zealand with \$76 million, other Africa with \$70 million, and the Middle East with \$63 million. Canada is the world's largest net importer of farm machinery. No other single country is remotely close to her in this regard.

### **Domination of Large International Companies**

Over the postwar years, world trade in farm machinery has become dominated to an increasing extent by large international companies such as Massey-Ferguson, Ford, Deere, and International Harvester, which have developed their own marketing and distribution facilities in a growing number of countries. While many of these companies have been involved in an extensive trade in farm machinery for many years, it is only within the past decade that some of them have begun to organize themselves on what may be called a multinational corporate basis. A multinational corporation is one in which national corporations in individual countries are responsible for product development and marketing decisions in their country or region but are subject to the over-all co-ordination of the corporate headquarters. One major company described this development to the Commission as follows:

The establishment of decentralized marketing and manufacturing activities or the decentralizing of these activities to the market places in which manufacturing and marketing occurred, in other words to the countries in which this occurred, became important when Massey-Ferguson decided that its role was best expressed as that of a multinational company, that is a company that had at its top a small intensive group of generalized staff and specialized staff which was concerned principally with coordination and forward planning, etc., and with progress in the market places of the world, (the major activities of course were those in which we manufactured and in which we controlled the distribution structure down to at least the dealer level). These areas at one time were nine in number and we now operate in 10 countries on this basis. This took place in the area, starting in 1957, it culminated in a major change in organization structure and in organization philosophy—it was announced on November 1, 1959 and therefore it properly dates back to that period. . . . our ability to do this quickly and with a relatively minor amount of rearrangement at the various national or operations unit level was the result of earlier management decisions that were taken, some quite consciously and subjectively, and others as a result of market and investment location influences. We were in France in a strong way and we were in Germany in a relatively strong way, we were definitely located in the United Kingdom, the North American operations were a kind of a common market and our strength was relatively acceptable. We were in Australia and we had acquired a good base in that area, and so forth; for these reasons it became necessary to determine how one could operate a very strong and profitable U.K., French and German, etc., group of operations and yet maintain a structure of North American companies with foreign subsidiaries. This was highly

unsatisfactory, the response factor alone to changes and management techniques, etc. much too long. Therefore we determined over a period of two years of rationalizing our organizational philosophy that we had to become a multinational company.<sup>2</sup>

As this statement makes clear, it is in considerable part the need to respond quickly to rapidly changing market situations that has made necessary a more decentralized form of corporate organization. In the words of one European executive, "the product life cycle is getting shorter and you may miss the market completely unless you get a new product out on time". This consideration is reinforced by the very marked differences that exist in the agricultural machines required in different areas. The swather which is widely used in Western Canada is used to a much lesser extent in the United States and is scarcely used at all in Western Europe. Hay-mowers in use in North America are not well adapted for use in Europe. Even the type of combine most suitable to one market may have to be changed very substantially to meet the requirements of other markets. In general, North American markets lead the world in their demand for a high level of sophistication in their machinery requirements. Increasingly, too, there has been a demand in many markets for more specialized types of equipment to meet the needs of particular types of farming. It was reported to the Commission that the increasing demand for specialized tractor applications had resulted in the "growth in the number of Ford tractor driveline combinations, based on major options of engine, transmission and rear axle from 24 in 1958 to over 200 in 1966".<sup>3</sup>

This trend towards an increasing number of models and options on different machines may have been one of the factors that influenced some companies to rationalize their operations on a worldwide basis. The Ford Motor Company, which until recently had considerable duplication in its tractor production facilities in Britain and the United States, now has rationalized its tractor production on the following basis. Major components for all Ford tractors are manufactured in three locations—Basildon, England, Antwerp, Belgium, and Highland Park, Michigan. Engines, front axles, and hydraulic units are manufactured in Basildon, 6- and 8-speed transmissions and rear axles in Antwerp, and Selecto 10-speed and 4-speed transmissions in Highland Park. In addition, these three locations have a daily assembly capacity of 300, 125, and 180 tractors, respectively. Tractors are also assembled from varying degrees of "knocked down" conditions at 27 locations throughout the world, in each case out of major components manufactured at these three major locations. As a result of this realignment of production facilities, the same basic tractor models now are sold throughout the world.

<sup>2</sup>Royal Commission on Farm Machinery, Transcript of Evidence, *Hearings*, Vol. No. 36, January 8, 1968, pp. 3943-4.

<sup>3</sup>Ford Motor Company of Canada, Limited, *Brief to the Royal Commission on Farm Machinery*, Ottawa, November 16, 1967, p. 6.

Similarly, Massey-Ferguson reported that:

... centralized engineering control has brought a degree of MF product standardization and international component interchangeability said to be unrivalled in this or any other manufacturing industry.

Massey-Ferguson, for instance, could take a transmission made in Sao Paulo, an engine manufactured in France, put them with sheet metal parts from England and assemble a tractor to specification in Detroit, . . .<sup>4</sup>

In fact, for all but its largest North American tractors, this company uses diesel engines from England, axles and transmissions from Britain and France, stamped metal from its Toronto works, castings from its "M" Foundry in Brantford, and sheet metal and other components from various local suppliers—with all these components being assembled in its Detroit factory. (It has also begun to develop a similar pattern for the combines which it now produces in five different locations.) It is clear that this trend toward the concentration of the manufacture of components in a few basic locations permits economies of scale that a more dispersed pattern of production would deny.

While Ford and Massey-Ferguson have taken the lead in the trend toward a worldwide centralization of component manufacture, other major companies also have moved to extend the range of their international farm machinery operations. Deere & Company in 1957 acquired the German agricultural equipment manufacturer, A. G. Lanz, and has subsequently established a combine plant at Zweibrücken, a new foundry at Mannheim, Germany, and a new diesel engine plant at Orléans, France. It has also set up production facilities in Argentina and in other parts of the world. This company appears, so far, to be keeping its European and North American operations separate, although the Lanz factory has supplied tractors in the smaller-horsepower range to the Canadian market. During recent years International Harvester has been rationalizing its European manufacturing operations, and by 1967 it was expected to have its combine production concentrated in France, its engine production centralized in Germany and Britain, its tractor transmission production concentrated in France, other key tractor components concentrated in one or two factories, with final tractor assembly taking place in Germany, France, and Britain.

Another pattern has been followed by the White Motor Company, which in recent years has arranged with Fiat to market in North America the Fiat tractor in the smaller-horsepower ranges under the Oliver and Cockshutt brand names. In a somewhat similar pattern, Ford now markets a modified version of the most widely-used European combine, the Claas, in the United States and in Eastern Canada. Again, New Holland, a division of Sperry Rand, markets the Clayson combine under the New Holland name in Canada and the United States, and has recently established a plant in Nebraska which manufactures a combine for the

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<sup>4</sup>Massey-Ferguson Industries Limited, *Brief to the Royal Commission on Farm Machinery*, Ottawa, January, 1968, Vol. I, Ch. II, p. 103.

North American market out of major components imported from Belgium. New Holland, in addition to owning a majority interest in the Clayton plant, has manufacturing facilities in France, England, and Australia.

#### **Position of Local and Regional Manufacturers**

In addition to the major international companies which have been moving increasingly towards a pattern of centralized manufacture of major components, especially for combines and tractors, there are in most major markets of the world, manufacturers who concentrate on either local or regional markets. Thus in Sweden, a domestic firm, Bolinder-Munktell (Volvo), is reported to have about 40 per cent of the Swedish tractor market, and exports its tractors and combines throughout Europe and the Middle East. In Italy, Fiat is estimated to have about half the Italian tractor market and exports its tractors throughout Western Europe and to other parts of the world, as well as supplying tractors for North America to the White Motor Company. Similarly, the company of Klöckner-Humboldt-Deutz A.G. is estimated to have about one-fifth of the German tractor market, but also sells extensively in other countries in Western Europe and elsewhere. In addition, it has recently acquired Maschinenfabrik Fahr A.G. a major European manufacturer of combines and other farm equipment. In Western Canada, its tractors are sold by the Canadian Co-operative Implements Limited. C.C.I.L. has also begun to sell the larger Volvo tractors. Renault, a firm partly owned by the French government, has an important position in the French tractor market and also exports, especially to other Common Market countries and to former French colonies. In Canada, its tractors are sold in Quebec by the Coopérative Fédérée de Québec.

From this brief review of recent developments in world markets for farm machinery, three trends are deserving of particular comment. One is the growing importance of the large company that caters to a regional or worldwide market. A second has been the trend towards the concentration of the production of major tractor or machinery components in a single plant, although the final product may be assembled in a number of different locations throughout the world. The third development has been the growing importance of Western Europe as a source of supply for farm machinery in major markets around the world. This latter development has been accompanied by some corresponding decline in North America as a source of supply for world markets.

The growing importance of major companies in both national and international markets undoubtedly reflects the economic advantages that are gained when management, marketing, and engineering and research skills, are spread over a larger volume of total sales. For example, Massey-Ferguson's worldwide sales increased from \$21 million in 1939 to \$1,043 million in 1969 and this growth must have made possible considerable economies in the use of scarce engineering, research, and management skills.

The trend towards the concentration of tractor component production, and the worldwide standardization of tractor models that has accompanied it, may well reflect the pressure to reduce production costs as tractor manufacturers have begun to produce a wider range of models and options for a market which, in terms of total number, has not been growing in size. According to one estimate, the total number of tractors (810,000) produced in 1966 in non-Communist countries was only slightly more than had been produced 15 years earlier in 1951. The total for the latter year was 777,000.<sup>5</sup> Although the total number of tractors produced in 1966 was lower than in 1951, the total horsepower of tractors produced may well have been double that produced in 1951. However, economies of scale depend largely on the number of units produced and, in the absence of a growth in total numbers, manufacturers have had to seek other methods of gaining economies of scale in order to keep the price of their product in a marketable range. Concentration of component production, together with the disappearance of some smaller producers, has been one of the avenues that the industry has followed to keep unit costs down. Undoubtedly, this move to a more decentralized pattern of component production has been facilitated by improvements in transport and communications. The advent of the jet aircraft and new devices for transmitting engineering designs and specifications has made it easier to co-ordinate and manage manufacturing plants that are scattered around the world.

The shift towards a greater variety of models and more sophisticated equipment has been relatively recent. The Commission was told that: "Only eight years ago Massey-Ferguson made only one tractor similar to the Ford Model "T", one tiller, one tractor, one power train, one anything. We ground them out like hotdogs. There weren't any real concessions made to more sophisticated customer needs."<sup>6</sup> Since that time the industry has moved rapidly towards more variety of models and complexity of product.

#### **Relative Competitive Position: North America and Europe**

*Cost Factors* — The relative competitive position of North American and European producers in world markets reflects a combination of wage costs, productivity, relative exchange rates, tariffs, and other restrictions on trade, and transport costs. When Ford decided to reorganize its tractor production facilities, it chose to build new plants in Basildon, England, and Antwerp, Belgium. This decision may have been influenced in some degree by tariffs in the EFTA and the Common Market, since output from both locations can be shipped into North America on a duty-free basis. But it seems likely that it also reflects a management decision that both Antwerp and Basildon were lower-cost locations for the production of major tractor components than Detroit. Data for average weekly wages in 1965 suggest that wages in Britain are little more than half of those paid in

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<sup>5</sup>Ford Motor Company of Canada Limited, *op. cit.*, data taken from Table 1.

<sup>6</sup>Hearings, *op. cit.*, Vol. No. 36, January 8, 1968, p. 3951.

the United States. Where new production facilities are built and a new labour force is recruited, North American management may well be able to establish productivity levels close to those achieved in North America. Since other basic materials such as steel are as low or lower in most western European countries as they are in the United States, the lower labour costs achieved should give substantially lower over-all costs. For tractors, Commission estimates indicate that production costs at any given volume are about 25 per cent lower in Britain than they are in the United States.<sup>7</sup>

However, productivity levels generally are much lower in Western Europe than they are in the United States, so that even when North American management acquires or builds new production facilities in Western Europe it may often have to accept lower productivity levels than customarily prevail in North America. One company, New Holland, reported to the Commission that taking the productivity in its United States plants to be 100, the comparative productivity of its plants in foreign countries, as measured by the number of man-hours required to do equivalent jobs, was for Belgium, 90, France, 67, England, 63, Australia, 63.<sup>8</sup> They attributed this difference, in very large degree, to the national managerial philosophy in these countries. This philosophy would be reflected in the attitudes of workers, and in the methods used, the way materials were handled, and the layout and tooling of the plant. In some measure, too, lower wage rates may lead to less capital-intensive methods which imply a lower output per worker. However, this adaptation of methods to wage levels does not always occur. In some recently constructed plants, the methods used appear to be as capital intensive as any used in North America. The Commission was told by one Swedish engineer that their company had recently costed three different methods of producing an engine and they had found that the most highly automated method was much the cheapest for a reasonable volume of output.

*Recent Expansion Decisions* — In assessing the competitive position of various countries in the world market for farm machinery it is useful to examine the recent plant-construction decisions of the major international companies. Because these companies have developed their own distributor and dealer networks in a number of major countries, they are free to plan on supplying these networks from the most economical source, taking into consideration manufacturing costs, tariffs, and transportation costs. However, some emphasis must also be given to what one witness described as the intangible advantage of having production facilities in your major market areas.

An examination of decisions with respect to the location of new manufacturing facilities in recent years by seven major North American companies suggests that Western Europe has been a favoured location. As Table 14.4 shows, over the

<sup>7</sup>Royal Commission on Farm Machinery, *Special Report on Prices of Tractors and Combines in Canada and Other Countries* (Ottawa: Queen's Printer, December 1969), pp. 66-72.

<sup>8</sup>New Holland Division of Sperry Rand Corporation, New Holland, Pennsylvania, U.S.A., *Brief to the Royal Commission on Farm Machinery*, Ottawa, November 15, 1967, p. 4.

period 1955-67, in terms of square footage, some 41 per cent of new production facilities has been located in Western Europe, of which 26 per cent was in the EEC (mainly in Belgium, France, and West Germany) and 15 per cent in the EFTA countries, mainly in Britain. New facilities in United States were almost the same in total area as those in Western Europe—about 40 per cent of the total. Data are fairly approximate and for most countries include facilities built for the manufacture of light industrial equipment as well as farm machinery. Canada received about 7 per cent of the total and Latin America about 9 per cent.

TABLE 14.4—INCREASES IN MANUFACTURING PLANT CAPACITY  
FOR MAJOR NORTH AMERICAN FARM MACHINERY MANUFACTURERS,  
BY COUNTRY OR REGION, 1955-67

	Total Increase in Capacity ('000 sq. ft.)	Percentage of Total
Canada	1,059	7
United States	6,213	40
European Economic Community	4,034	26
European Free Trade Association	2,329	15
Latin America	1,370	9
Australia	157	1
India	89	1
South Africa	178	1
Total	15,429	100

Note: Data for most firms included manufacturing space devoted to light industrial equipment as well as farm machinery. While some companies reported manufacturing space only, others included administrative office space adjacent to manufacturing facilities as well.

Source: Data were provided by the following companies: Case, Deere, Ford, International Harvester, Massey-Ferguson, New Holland, and White Motor.

*Tariff Rates* — In some measure this recent concentration of new plant construction in Western Europe reflects the expanded market opportunities opened up by the creation of the European Common Market and the European Free Trade Association. While tariffs on agricultural machinery are moderate in comparison to tariffs on some products, they are still high enough to have a significant effect on plant location decisions. This is particularly true when one considers not just nominal tariff rates but the effective protection offered to the total farm machinery manufacturing operation, with full allowance for the level of tariffs on the raw materials or components used by the industry.

A recent study has estimated effective tariff rates for farm machinery in a number of important countries or areas. As the data in Table 14.5 show, effective tariff rates on farm machinery production in Britain, Sweden, and the Common Market are appreciably higher than nominal rates would indicate. In contrast, in the United States, because manufacturers may have to pay tariff duties on imported materials while receiving little or no protection on their final product, the effective tariff rate is negative.



TABLE 14.5—NOMINAL AND EFFECTIVE TARIFF RATES ON FARM MACHINERY, SELECTED COUNTRIES, 1962

	Nominal Tariff Rate	Effective Tariff Rate
	(Per cent)	(Per cent)
United States	0.4	-6.9
Britain	15.4	21.3
Sweden	10.0	16.0
Japan	20.0	29.2
European Economic Community	13.4	19.6

Source: Bela Belassa, "Tariff Protection in Industrial Countries: An Evaluation", *Journal of Political Economy*, December 1965.

Because tariff regulations are usually complex and often vary with the size and type of machine, it is difficult to summarize in concise fashion the tariffs that are in effect on different products. However, an unweighted average of tariff rates applying in the major western European countries is given in Table 14.6. These averages are based on tariff rates that were in effect about the time the European Common Market was formed.

TABLE 14.6—AVERAGE TARIFF RATES ON AGRICULTURAL MACHINERY AND TRACTORS, WESTERN EUROPE, 1957-59

	Agricultural Machinery	Tractors
Austria	19	22
Denmark	5	2
Norway	9	0
Portugal	13	2
Sweden	10	10
Switzerland	8	11
Britain	14	15
Benelux	7	15
France	16	22
Germany	5	7
Italy	20	27
European Economic Community	11	20

Source: *Atlantic Tariffs and Trade*, Political and Economic Planning, London, 1962.

Both of the above sets of tariff data suggest that tariff rates among both the Common Market and EFTA groups are high enough to give a significant advantage to farm machinery manufacturers producing inside the tariff barrier. As a result of the Kennedy Round trade negotiations, the Common Market tariff on a wide range of farm machinery and harvesting equipment will decline by January 1st, 1972, from 9 to 4.5 per cent. Common Market tariffs on agricultural tractors will remain unchanged at about 18 per cent. In Britain, on the same date, tariffs on

agricultural tractors will decline from 15 to 7.5 per cent and tariffs on other farm machinery which now range from 10 to 14 per cent will fall to from 6 to 7.5 per cent.

*Credit Availability and Foreign Aid* – International trade in farm machinery is affected not only by tariffs but also by credit arrangements and by various forms of foreign aid. In respect to credit it was argued before the Commission that the credit support available to Canadian manufacturers is much less generous than that available to manufacturers of farm machinery in many other parts of the world. In the words of one manufacturer, "If Chile can get ten years' credit with no down payment from three different countries in Europe and one Iron Curtain country she will not buy on four-year-credit limit from Canada. You just can't sell under those circumstances, and certainly no private enterprise should be asked to take those kinds of credit risks when in all other parts of the world governments are underwriting these commercial transactions."<sup>9</sup>

However, officials of the Department of Industry, Trade and Commerce advise that the situations suggested by Mr. Staiger are relatively rare. Farm machinery is sold internationally against cash or short-term credit to developed countries and on short- to medium-term credit, mostly two to three years, to developing countries. Where governments buy sizable quantities for resale to farmers, credit may be extended up to five years. Longer-term credit is sometimes provided where the sale of farm machinery is part of a much larger development project.

The Canadian Government's policy is to support exports through insurance, credit guarantees, or long-term loans on a basis that matches the support provided by other governments, but not to exceed it. Information is provided to the Canadian Government by foreign government export credit and insurance agencies through the "Berne Union" so that Canada is aware of the credit terms provided on most export sales. Since Canada is a net importer of capital, it is considered undesirable that she become involved in a credit-granting contest as a basis for promoting export sales.

An examination of data on the relation between aid programs and exports of agricultural machinery for the United States, Britain, and a number of European countries, suggests that aid-financed exports are a significant and growing portion of farm machinery exports. Between 1962 and 1965 aid-financed exports of agricultural machinery from the United States have risen from 1.8 per cent to 5.6 per cent of total U.S. exports of this commodity. Moreover, by 1965, some

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<sup>9</sup> *Hearings, op. cit.*, Vol. No. 36, January 8, 1968, pp. 3970-71.

two-thirds of U.S. exports of agricultural machinery to a selected group of Asian and African countries was aid-financed. The equivalent percentage for six Latin American countries was 45. For Britain, aid-financed exports amounted to 2.1 per cent of her total exports of agricultural machinery in 1964, 2.3 per cent in 1965, and 3.7 per cent in 1966.

Farm machinery is eligible for support under Canadian aid programs. However, aid-supported export sales have been relatively small. The reasons for this are varied. Canada produces very few tractors—the farm machine most frequently requested. Further, even for machines produced in Canada, such as combines, one of the principal Canadian producers, Massey-Ferguson, has extensive production facilities in Western Europe and may often prefer to supply requests for combines under aid programs from one of her three European plants. Even when the original shipment comes from Canada the follow-up may be from a plant outside of Canada. However, these arguments do not apply to companies such as Cockshutt and Versatile, which produce all their combines in Canada.

*Ocean Transportation* — Canada's participation in world trade in farm machinery is significantly affected by ocean transport rates. However, the effects of these rates on trade is difficult to summarize precisely, because rates vary significantly, depending on whether tractors or other farm machines are shipped packed or unpacked, and on whether the machines are shipped under general conference rates or under negotiated contract rates. The latter are available whenever a manufacturer ships to a given destination in substantial volume. Conference rates usually reflect the volume of traffic moving between any two points, and are generally lower for shipments from Europe to North America than for the reverse movement from North America to Europe. This reflects the large movement of grain and other bulky commodities eastward across the Atlantic Ocean which creates a demand for back-haul cargo. Rates on packed machines are generally lower, often less than half, than those on unpacked machines. Tractors moving from Britain to Canada are an exception. Here, the packed rate is higher than the rate on unpacked machines.

Table 14.7 provides estimated ocean freight charges between a number of major points throughout the world for a Ford 5000 (56 HP) diesel tractor. The data suggest that for packed shipments, tractors can move across the Atlantic from North America almost as cheaply as they move in the reverse direction. However, freight costs from Britain to Canada on an unpacked basis are especially low. For shipments to more distant points such as Australia and South Africa, Europe appears to have some freight advantage over North America, particularly on packed shipments. In addition, Table 14.8 provides detailed data on ocean freight costs on averaged-sized tractors in different horsepower categories between Britain and Montreal.



TABLE 14.8—FREIGHT COSTS FOR UNPACKED TRACTORS OF DIFFERENT SIZES  
SHIPPED BETWEEN CANADA AND BRITAIN, MID-1967 OR MID-1968  
GENERAL FREIGHT RATES

(Canadian dollars)

PTO Horsepower Group	Volume Freight Units (40 cubic feet)	Weight (lbs.)	Shipped From:	Shipped to:	
				Montreal Canada	Britain
Under 45	6.2	3,600	Montreal		243
			Britain	101	
45-60	8.8	5,100	Montreal		346
			Britain	144	
60-75	9.1	5,700	Montreal		358
			Britain	149	
90-100	16.0	8,900	Montreal		625
			Britain	258	
Over 100	19.6	14,500	Montreal		765
			Britain	315	

Note: Typical dimensions and weights of tractors in each horsepower group used with freight rates from applicable shipping conference rate schedules, or direct quotations from shipping lines. Amounts include loading charges and Seaway tolls. General freight rates (open to the public), are usually much higher than contract rates from continental Europe to Canada.

Source: Commission estimates based on data noted above.

Ocean freight charges on combines (shipped packed) between Europe and North America range between \$1,300 and \$1,700 per combine. However, contract rates lower shipping costs dramatically. New Holland estimated their cost of bringing combines from Belgium to North America at \$400 per unit. Another firm reported shipping costs from continental Europe to Canada of \$600. No data are available on contract rates for shipments from Canada to other countries. Since prices of combines are very significantly lower in Western Europe than they are in Canada, it seems unlikely that there will be any substantial export of combines from Canada to Western Europe. Versatile's much lower-priced combine could be an exception to this pattern. However, if Versatile desires to export to Europe or elsewhere throughout the world, it will be faced with the problem of building up a reliable repair parts distribution facility in the countries it wishes to supply.

## Chapter 15

### THE PATTERN OF TRADE BETWEEN CANADA AND THE UNITED STATES AND BETWEEN CANADA AND OTHER COUNTRIES

At an early stage in its development, the farm machinery industry in Canada acquired a significant export trade. In 1887, one of the leading Canadian manufacturers, the Massey Company, set up sales agencies in South America, England, continental Europe, and Australia. They were soon followed in this enterprise by the Harris Company and when these two companies merged in 1891 their export business was consolidated and continued to prosper. Some data showing the pattern of this trade during the pre-Second-World-War period are given in Table 15.1. By the early 1900s Canada was already exporting close to \$2 million worth of farm machinery, with significant markets in Australia, Britain, Germany, and France. By the late twenties Argentina had become Canada's leading export market, taking some \$3.8 million worth of farm machinery annually. Following the removal of the U.S. tariff in 1913, exports to that country increased also and by the late twenties the United States had become Canada's second most important market, taking about 23 per cent of her total exports. Significant new markets had also been developed in South Africa and Russia, and total exports of farm machinery reached a pre-Second-World-War peak of \$20.1 million in 1929. As a result of higher tariffs, the Great Depression, and political factors, Canada's exports to Germany, Russia, and France had all but disappeared by the late thirties. However, exports to South Africa, Argentina, and the United States were fairly well sustained, and exports to the United Kingdom even increased. On a commodity basis, Canada's early export trade centred around the binder and a few other implements. In 1914, for example, Canada's \$7.3 million worth of exports included \$3.1 million in binders, \$.9 million in mowers, \$680,000 in drills, and \$450,000 in plows. Throughout this period, Massey-Harris was by far the most important firm on the export side.

The farm machinery industry has often been cited by economists as an example of the results that can be expected from a free-trade arrangement between Canada and the United States. The U.S. tariff on farm machinery was removed in 1913, and after a number of "ups and downs" the Canadian tariff was removed in 1944. In examining the effects of these changes it is useful to look both at what happened to total trade between Canada and the United States and to its impact

TABLE 15.1—CANADIAN EXPORTS OF FARM MACHINERY, BY COUNTRY:  
THE HISTORICAL PATTERN

	Annual Averages (\$'000)		
	1900-03	1926-30	1937-39
Total to all countries	1,891	16,190	8,201
United Kingdom	419	579	1,340
France	226	1,636	85
Russia	58	1,040	—
Germany	354	426	13
Argentina	36	3,823	1,915
Australasia	644	1,890	499
South Africa	24	1,149	1,068
United States	28	3,750	2,510
All others	101	1,897	771
	Percentage		
	1900-03	1926-30	1937-39
Total to all countries	100.0	100.0	100.0
United Kingdom	22.4	3.6	17.0
France	12.1	10.1	1.1
Russia	3.2	6.4	—
Germany	19.4	2.6	.1
Argentina	1.9	23.6	23.0
Australasia	33.3	11.7	6.1
South Africa	1.1	7.1	13.0
United States	1.4	23.2	30.2
All others	5.1	11.7	9.4

Note: Data are averages of fiscal years and do not include re-exports. Percentages and dollar amounts may not add due to rounding.

Source: Dominion Bureau of Statistics, *Trade of Canada*, various years.

upon individual companies. Even before the U.S. tariff was removed the threat of reciprocity between Canada and the United States had caused Massey-Harris to acquire the Johnston Harvester Company in Batavia, New York, in 1910. At the time, this company with its American distribution network represented a valuable addition for Massey, but, in the end, as the centre of the market shifted westward it proved an uneconomic production location and the factory was closed down.

Prior to the removal of the U.S. tariff, Canadian exports of farm machinery to the United States were almost non-existent. For the period 1900 to 1903 they averaged only \$28,000 or about 1.5 per cent of total Canadian farm machinery exports. However, after the tariff was removed there was an appreciable rise in Canadian exports to the United States. They reached \$1.3 million in 1922-23 and \$4.4 million in 1928-29. For the period 1926 to 1930 as a whole, the American market took 23.4 per cent of Canadian exports. Nevertheless, when one considers the size and proximity of the market it is surprising that it was not even more important. Canada's exports of farm machinery to the United States in this period were slightly less than her exports to Argentina.

Some evidence as to why exports to the United States were not more extensive was given by executives of Massey-Harris, testifying before a House of Commons Committee in the 1930s. The President of the company stated that he would be unwilling to attempt to develop a market in the United States that was heavily dependent on Canadian production. He argued that American farmers had a prejudice against imported equipment, and, in addition, there was always the risk that the tariff would be reimposed. For these reasons, although Massey-Harris was making a major effort to increase their penetration of the U.S. market at the time, they also took steps to acquire additional production facilities in the United States. In the same testimony the President stated that Massey could compete on equal terms with American producers in the Argentine market but not in the United States.

During the same hearings the President of International Harvester reported that very little of their Canadian production was exported to the United States. Because of their U.S. company's larger volume, he contended, its production costs were lower. He appeared to have never considered concentrating certain lines in the Canadian plant in order to achieve a large volume low-cost operation. The other major American producer, John Deere, had acquired a small plant at Welland when it took over Dain and Company, an American producer of mowers. However, this plant was closed down completely in 1926 and remained closed until 1932. In 1924 the Canadian tariff had been reduced from 10 to 6 per cent on harvesting machinery, from 12.5 to 7.5 per cent on tillage equipment, and from 15 to 10 per cent on plows. Following the increase in the tariff to 25 per cent on all farm machinery except tractors in September 1930, Deere's sales in Canada fell sharply. Deere's Canadian sales in 1931 were little more than one-tenth of their 1930 level and only about 5 per cent of their 1929 level. The Welland plant was reopened in 1932 and by the mid-thirties was producing an extensive range of farm equipment, including binders, plows, field cultivators, disk harrows, spring- and spike-tooth harrows, seed drills, and disk tillers. However, out of this long list of products only the disk tiller was shipped into the U.S. market. It seems clear that in this period the Deere Company never seriously examined the possibility of using its Canadian plant as a source for any important part of its U.S. market. Indeed, if it had not been for the tariff imposed in 1930, and the expansion of manufacturing operations it induced, Deere might well have abandoned manufacturing operations in Canada permanently.

Prior to 1944, the other major Canadian producer of farm machinery, Cockshutt, had apparently not attempted to develop an extensive market for its line of equipment in the United States. For a short period in the mid-twenties they sold several hundred stiff-toothed cultivators in Montana, after sending a number out in response to a request from an agricultural college. However, once American firms started producing a similar product, this market gradually disappeared. Cockshutt's unsuccessful attempt to build up its American market after 1945 is described elsewhere in this Report (see Chapter 4).



Thus, before the Second World War, although United States had become a significant market for Canadian farm machinery, the Canadian industry still sold its products in many other countries throughout the world, including the United Kingdom, Argentina, South Africa, Australia, and New Zealand. In the late thirties the United States took about 30 per cent of Canadian farm machinery exports, compared with 70 per cent for all other countries. Since 1945, however, there has been a steady decline in Canadian exports to countries other than the United States (see Table 15.2). Indeed, by 1967 all but 5 per cent of Canada's exports of farm machinery were being shipped to the United States. While Canada's exports to all other countries were only \$2.2 million less in current dollars than their average level from 1926 to 1930, they were probably not more than one-third of their earlier level in dollars at constant prices. Given the very large growth that has occurred in farm machinery markets throughout the world, the decline in Canadian exports to these countries has been very marked indeed. In contrast, except for a decline during the market slump in the mid-fifties, there has been a steady growth in Canadian exports to the United States, and they reached a peak of \$184 million in 1967.

TABLE 15.2—CANADIAN EXPORTS OF FARM MACHINERY  
TO UNITED STATES AND ALL OTHER COUNTRIES,  
SELECTED YEARS, 1900-69

	Total	United States	All Other	United States	All Other
		(Millions of dollars)		(Per cent)	
1900-03	1.9	.0 <sup>1</sup>	1.9	1.4	98.6
1910-14	5.9	.1	5.8	1.7	98.3
1922-23	5.7	1.0	4.8	16.3	83.7
1926-30	16.2	3.8	12.4	23.0	77.0
1937-39	8.2	2.5	5.7	30.2	69.8
1945-47	32.7	17.8	14.9	52.1	47.9
1948-52	95.8	73.9	21.9	76.9	23.1
1953-57	71.6	56.6	15.0	79.2	20.8
1958-62	95.7	88.2	7.5	92.0	8.0
1963-67	159.5	146.8	12.7	91.8	8.2
1967	194.3	184.1	10.2	94.8	5.2
1968	168.5	158.4	10.1	94.0	6.0
1969	180.5	170.9	9.6	94.7	5.3

Note: Above data do not include re-exports. See Table A.5 for net trade balance between Canada and World including re-exports.

<sup>1</sup> Actually \$30,000.

Source: Based on data from Dominion Bureau of Statistics, *Trade of Canada, Exports by Commodities*, Cat. No. 65-004 (Ottawa: Queen's Printer), various years, 1900-69.

Although difficult to explain completely, this sharp realignment in the pattern of Canadian farm machinery exports appears to be due to a number of factors. Following the removal of the Canadian tariff in 1944, the major manufacturing firms in Canada gradually reorganized their plants so they became specialized for the production of certain implements for the entire North American

market. At the same time, restrictions in the sterling area against imports from the dollar area and other countries cut off or restricted a number of Canada's important prewar markets. For a short period following the Second World War exports of farm machinery were supported by various aid and loan programs, and between 1948 and 1952 Canadian exports to countries outside the United States averaged around \$22 million annually. But as the amount of aid tapered off and domestic output in Western Europe recovered, exports to these areas declined. Postwar tariff reductions also reduced the importance of Commonwealth preferences for farm machinery. Further, tariffs and other restrictions limited Canadian access to other prewar markets, as countries such as Argentina, Brazil, and Australia attempted to foster growth in the manufacturing of their own agricultural implements.

Another significant development—in part a reflection of the above restrictions—was the change in the character of Massey-Harris' operations from a company that relied mainly on its Canadian manufacturing operations to supply markets throughout the world to an international company with its own manufacturing operations in a large number of different countries. This has meant that markets which Massey formerly supplied from Canada can now be supplied from plants within their own country, as is the case in the United Kingdom or South Africa, or from plants in a nearby country. Massey had already acquired a plant in France and one in Germany in the mid-twenties but these were relatively modest operations compared with the company's present international facilities (for a detailed description of some of these changes see Chapter 4).

Another development that may have adversely affected the ability of Canadian farm machinery to compete abroad has been the increasing sophistication and size of the equipment now demanded in the North American market. This has meant that equipment suited to Canadian farm needs may be too large or advanced for many other countries. Still, many of the newer developments, such as power steering and advanced types of transmissions, take the form of options that can be left off the smaller machines shipped to less-advanced markets.

In view of the decline that has occurred in Canada's exports of farm machinery to countries other than the United States, it is useful to compare Canada's trade outside North America with that of the United States. Such a comparison for 1966 is provided by the data in Table 15.3, which show Canadian exports of farm machinery, by type of machinery and destination, as a percentage of U.S. exports. These data indicate that Canada has a much smaller share of exports to these third market areas than she has for total exports. As the final two columns of this table show, Canadian exports to third markets are only 3.3 per cent of U.S. exports compared with 26.4 per cent for the total export trade. If tractors are excluded, the comparable figures are 14.5 per cent and 71.7 per cent. Further, this difference exists for virtually every category of machinery to every destination. Since Canadian manufacturing plants are on the

TABLE 15.3—CANADIAN EXPORTS AS PERCENTAGE OF U.S. EXPORTS, AGRICULTURAL MACHINERY,  
BY TYPE OF MACHINE AND DESTINATION, 1966

	Standard International Trade Classification	European Economic Community	European Free Trade Association	Other Western Europe	Australia and New Zealand	Japan	Middle East	Other Africa	Latin America	All Countries Except U.S. and Canada	
Agricultural Machinery	712.0	4.7	7.5	1.4	8.3	4.5	2.1	7.4	2.4	26.4	3.3
Cultivating machinery	712.1	—	24.2	—	23.7	—	35.2	—	4.1	70.7	8.1
Harvesting machinery	712.2	16.8	19.3	5.8	31.3	34.5	—	—	15.7	81.5	15.7
Dairy machinery	712.3	—	56.4	—	—	—	—	—	—	21.5	12.4
Tractors	712.5	.5	—	—	2.4	—	—	—	.2	2.0	.4
Other agricultural machinery	712.9	—	—	—	—	—	—	—	—	1.8	.4
Total, excl. tractors		11.2	18.2	4.6	26.6	12.8	11.2	4.9	8.8	71.7	14.5

Source: United Nations, *Commodity Trade Statistics*.

average closer to ocean transport than those in the United States, it seems clear that this difference must be due to other than strictly economic considerations.

Table 15.4 provides some historical perspective on Canada's share of the total farm machinery exports to third markets by Canada and the United States combined. It shows a significant decline in Canadian exports to the rest of the world relative to those of the United States. In the period from 1928 to 1930, the Canadian share was about 14 per cent; in the period 1946 to 1948 it was 15 per cent; and by 1964 to 1966 it had fallen to 8.5 per cent.

TABLE 15.4—CANADIAN AND U.S. EXPORTS OF FARM MACHINERY  
TO THE REST OF THE WORLD (EXCLUDING CANADA AND  
UNITED STATES), SELECTED YEARS, 1928-69

	Canadian Exports	U.S. Exports	Total United States and Canada	Canada's Share of Total
	(Millions of Canadian dollars)			(Per cent)
1928	12.1	65.1	77.2	15.7
1929	11.5	93.4	104.9	11.0
1930	14.3	79.9	94.2	15.2
1937	4.4	39.2	43.6	10.1
1938	7.0	38.4	45.4	15.4
1939	4.7	32.3	37.0	12.7
1946	14.3	56.6	70.9	20.2
1947	19.0	122.4	141.4	13.4
1948	24.4	177.3	201.7	12.1
1953	16.0	108.4	124.4	12.9
1954	23.6	136.8	160.4	14.7
1955	12.7	123.7	136.4	9.3
1963	10.0	129.6	139.6	7.2
1964	13.0	198.0	211.0	6.2
1965	19.6	157.7	177.3	11.1
1966	10.9	122.3	133.2	8.2
1967	10.2	139.3	149.5	6.8
1968	10.1	149.6	159.7	6.3
1969	9.6	158.5	168.1	5.7

Note: U.S. dollars converted to Canadian currency at applicable Bank of Canada rates.

Source: Foreign Commerce and Navigation of the United States, *U.S. Exports of Domestic Produce*, FT 410; Dominion Bureau of Statistics, *Trade of Canada*, various years.

The further rise in Canadian exports to the United States during the past few years reflects a number of factors. The devaluation of the Canadian dollar which culminated in the return to a fixed rate in June 1962 undoubtedly made Canadian plants more competitive in the North American market. In addition, Massey-Ferguson, a firm that concentrates a major share of its North American production in Canada, has recently been making a concerted effort to increase its share of the U.S. market. Any success it experiences in this endeavour is likely to be paralleled by a rise in Canadian exports to the United States. Further, after

Cockshutt was acquired by the White Motor Corporation in 1962 its manufacturing operations were changed from that of a full-line company selling a broad range of products to a plant specializing in the production of combines for the North American market. This change must have been reflected in an increase in Canadian exports to the United States.

The decline in Canadian exports to countries outside North America has also been paralleled by an increase in imports of farm machinery from Western Europe (see Table 15.5). Until comparatively recently, imports from Western Europe had rarely supplied more than 4 per cent of Canada's total imports of farm machinery. However, during the past decade Europe's share has risen significantly, reaching 6.8 per cent in 1964 and 9.6 per cent in 1967. Imports of tractors and tractor parts have been a major factor in this growth, and it reflects the increasing competitive strength of the European-produced tractor. In 1967, Western Europe supplied 14 per cent of Canada's total tractor imports. Moreover, these data may understate the importance of Europe as a source, since Canadian imports of Massey-Ferguson tractors from the United States contain a significant European content.

TABLE 15.5—CANADIAN IMPORTS OF FARM MACHINERY:  
FROM ALL COUNTRIES, FROM UNITED STATES,  
AND FROM WESTERN EUROPE, SELECTED YEARS, 1929-67

	Total (All Countries)	United States	Western Europe	United States	Western Europe
	(Millions of dollars)			(Per cent)	
1929	40.3	39.8	.6	98.8	.7
1939	20.9	20.1	.8	96.1	3.9
1952	197.3	190.1	7.1	96.4	3.6
1958	198.3	189.9	8.2	95.8	4.1
1964	330.1	307.2	22.5	93.1	6.8
1967	418.4	377.7	40.4	90.3	9.6

Source: Dominion Bureau of Statistics, *Trade of Canada*, various years.

The growing importance of Western Europe as a source of imports of farm machinery has also been reflected in the pattern of U.S. trade. Thus, as the data in Table 15.6 show, Western Europe now supplies about 16 per cent of all farm machinery imported by the United States compared with only 3.4 per cent in 1952. All of this increase in the European share of the U.S. market had occurred by 1958, and there has been little change in the relative position of Canada and Western Europe over the past decade. Still there have been divergent trends for different product groups. The western European share of total U.S. imports of harvesting equipment has risen from .3 per cent in 1958 to 5.5 per cent in 1967, and its share of all other machinery has risen from 5.2 per cent in 1958 to 10.6 per cent in 1967. In contrast, for tractors and parts, the Canadian share of U.S.

imports rose from 23.5 per cent in 1964 to 42.0 per cent in 1967, whereas during the same period the western European share fell from 75.8 per cent to 56.5 per cent. Canadian exports in this category include crawler tractors manufactured by International Harvester in Hamilton and tractor parts which are supplied from Brantford and Toronto to Massey-Ferguson's tractor plant in Detroit. The improved competitive position of Canadian-sourced supplies as a result of the devaluation of the Canadian dollar in the early sixties may well explain this recent shift. The rapidly increasing importance of the larger-horse-power tractors which are not manufactured in Europe has been a contributing factor to the decline in the relative importance of imports from Western Europe.

TABLE 15.6—U.S. IMPORTS OF FARM MACHINERY, BY COUNTRY OF ORIGIN, SELECTED YEARS, 1952-67

	1952	1958	1964	1967
	(Millions of U.S. dollars)			
From all countries				
Total	98.2	122.1	173.3	266.6
Combines, harvesters, and parts	41.4	53.0	97.7	151.9
Tractors and parts	15.2	29.3	29.4	50.6
All others	41.6	39.8	46.2	64.1
From Canada				
Total	94.5	99.8	145.1	221.1
Combines, harvesters, and parts	41.2	52.8	96.2	142.7
Tractors and parts	13.7	9.9	6.9	21.2
All others	39.6	37.1	42.0	57.1
From Western Europe				
Total	3.3	21.5	27.4	43.8
Combines, harvesters, and parts	.1	.2	1.2	8.4
Tractors and parts	1.5	19.3	22.3	28.6
All others	1.7	2.1	3.8	6.8
	(Percentage of total imports)			
Total farm machinery				
Canada	96.2	81.7	83.7	82.9
Western Europe	3.4	17.6	15.8	16.4
Combines, harvesters, and parts				
Canada	99.7	99.7	98.5	93.9
Western Europe	.3	.3	1.3	5.5
Tractors and parts				
Canada	89.9	33.9	23.5	42.0
Western Europe	9.9	65.9	75.8	56.5
All other farm machinery				
Canada	95.0	93.0	90.9	89.0
Western Europe	4.0	5.2	8.2	10.6

Source: United States, *Imports of Merchandise for Consumption*, various years.

Although total U.S. exports of wheeled agricultural tractors have been declining in dollar terms in recent years, American firms have remained competitive in this market over the past two decades, largely through their development of more sophisticated larger-horsepower tractors. Total U.S. exports of wheeled farm tractors and parts increased 11 per cent from 1964 to 1967, rising from \$188 million to \$208 million. Moreover, the average size of tractor exported has risen steadily. Whereas 42 per cent of U.S. agricultural tractor exports were under 35 HP in size in 1952, 75 per cent were over 60 HP and almost one-third were over 90 HP in 1967. Less than 3 per cent were in the under-35-HP category. A similar rise in horsepower size has been evident in U.S. exports of tracklaying and wheel-type construction tractors. Almost 80 per cent of U.S. exports of agricultural tractors go to Canada, Australia, and New Zealand—countries where larger farms and the use of larger tractors are most prevalent. Some details of these changes are provided in Table 15.7.

TABLE 15.7—U.S. EXPORTS OF TRACTORS, BY TYPE AND SIZE,  
1952, 1964, AND 1967

(Excluding contractors off-highway wheeled tractors)

(Millions of U.S. dollars)

	1952	1964	1967
Wheeled agricultural tractors and parts			
(Less parts and used machinery)	95.0	131.9	137.0
(Including parts and used machinery)	123.5	188.1	207.7
All other tractors and parts (tracklaying, wheel-type, construction and garden)	165.5	359.1	354.5 <sup>1</sup>
Total tractor and parts (including used)	289.0	547.2	562.2
Wheeled agricultural tractors, by size:			
Under 35 HP	39.6	6.1	3.7
Over 35 HP	55.4	125.8	133.3
35-60 HP	n.a.	39.1	32.4
Over 60 HP	n.a.	86.7	100.9
60-90 HP	n.a.	n.a.	57.2
90 HP and over	n.a.	n.a.	43.7
Used machinery parts	28.5	56.2	70.7

<sup>1</sup> Includes parts and accessories for contractors off-highway wheeled tractors, but not the tractors themselves totalling \$44.4 million.

Source: U.S. Exports, Schedule B Commodity and Country, FT 410, December 1967; Foreign Commerce and Navigation of the United States, Exports of Domestic Merchandise by Schedule B Commodity, 1958 to 1964, Table 11; Foreign Commerce and Navigation of the United States, Exports of Domestic Merchandise by Schedule B Commodity, 1952.

While Canada has allowed duty-free import of farm machinery since 1944, and the U.S. tariff was removed in 1913, there are some exceptions and some differences in treatment for each tariff. In 1963 the U.S. Customs Act was revised and, as a result, the U.S. treatment of a few machines and components became more restrictive. Canada makes use of "end-use" certificates which eliminate duties and taxes over broad ranges of products for certain user categories—in this case, farmers. Until 1963, the United States relied on "chief use" categories which exempted items from duty if it could be shown that their major use was limited to a category entitled to an exemption. Under these arrangements major farm machines generally entered both countries duty-free. Parts for use in the manufacture or repair of farm machines also moved freely, on submission of an end-use certificate in Canada, or on determination of their sole or chief use in agriculture in the United States. In addition, Canada allowed manufacturers of farm machines to import all raw materials duty-free, as well as machine tools used exclusively in the manufacture of farm machines. Both of these items are dutiable going into the United States. Perhaps the major difference in treatment between the two tariffs has been with respect to tractors. Both farm and industrial tractors can be imported into Canada duty-free. For the United States only farm tractors are duty-free. On other tractors there was a duty of 11.5 per cent. As a result of the Kennedy Round trade negotiations under the General Agreement on Tariffs and Trade (GATT) this will drop to 5.5 per cent by January 1, 1972.

In 1963 the United States undertook a major technical revision of its whole tariff structure. The intention of this revision was to clarify ambiguities and simplify the tariff's administration. In the revision, two principles were firmly established. One principle was that of specifically naming and grouping all similar items under common classifications, with subheads to identify component parts of the group which might differ in some way. Thus all bearings would be grouped together, with ball bearings, roller bearings and needle bearings forming subgroups. The second principle was that of removing general exemptions for certain "chief uses". In place of these exemptions the U.S. tariff set out to describe everything under separate categories. Exceptions were to be noted under each category. The precise description and categorization did not cause problems. But the question of exemptions did.

For example, in the field of agricultural machinery, a general exemption had applied to parts used in its production. For farm machinery manufacturers, custom-made parts, manufactured to their own designs, had been automatically duty-free under the earlier arrangements because their chief use was their only use—as parts for the manufacture of farm machines. Quite a substantial export business had developed from Canada of parts used in the manufacture of farm machines.

Although Canadian trade officials had anticipated the possible effects of the new U.S. tariff structure, U.S. officials were not prepared to provide the changes in their basic system of completely separate classifications on which the



new tariff had been drawn up, or to insert the large number of exemption clauses, item by item, which would have been necessary to recognize the existing treatment of farm machinery and parts. Even if the United States had been willing to make these concessions, however, it would have been difficult in practice to provide all the exemptions required to accommodate the existing situation. Further, the new tariff structure is much less liberal in its treatment of new devices that may be developed in the future. For example, the grain-loss monitor for combines developed at the University of Saskatchewan appears to be dutiable as an electronic device even though its chief and only use is on farm machinery. Formerly, it could have been imported into the United States duty-free under the "chief use" provision.

In interpreting the U.S. tariff it should be noted that a tariff item covering "parts" of an article covers a product solely or chiefly used as a part of such article, but does not prevail over a specific provision for such part. For example, piston-type engines for tractors are duty-free under tariff item 660.40 but all parts for these engines are subject to duty under item 660.52 at 6.5 per cent unless the part is specifically provided for in yet another section of the tariff. For example, a fuel pump for such an engine would be dutiable under item 660.94 at 8 per cent *ad valorem*.

For some products on which the revision to the U.S. tariff cut off existing trade, it proved possible to obtain later amendments which restored the duty-free treatment. Thus, prior to 1963, tires for tractors, combines and other farm machines had been imported into the United States duty-free as parts for farm machines. Canadian export of these tires amounted to about \$2.7 million in 1963. Under the tariff revision these tires became dutiable and exports dropped sharply. Two years later, an amendment restored the duty-free exemption. However, in the meantime, manufacturing facilities had been established in the United States, and Canadian exports have remained well below their former level.

During the Commission's hearings, a number of problem cases relating to the effect of the U.S. tariff on Canadian exporters were brought to its attention:

(1) Two Canadian companies were involved in the manufacture of binder, swather and combine canvases. Cosmos Imperial Mills Limited wove the heavy cotton canvases at its mill in Nova Scotia and Ducan Industries Limited of Lethbridge, Alberta, converted the cotton canvas by rubberizing it, cutting it to size, and adding slats. For a number of years, canvases had been shipped as new and replacement parts for agricultural machines to manufacturers in the United States and to central repair parts depots for manufacturers in Canada. Suddenly a duty of 17.5 per cent had been applied to these parts (as being parts made of rubberized canvas), and both companies saw the business which they had built up disappearing. Even farm machinery manufacturers in Canada would find it difficult to continue purchasing swather canvases from Ducan Limited. They would be able to ship completed machines duty-free to the United States with the binder canvases included, but they would have to pay duty on the replace-

ment canvases. If they bought all canvases in the United States, they would be able to bring them into Canada for original equipment installation and replacement duty-free. The President of Cosmos Imperial Mills reported that he had been told that concessions were being sought from the U.S. Government in other areas to compensate for the effect of the restriction in the new U.S. tariff. He stated that he was not interested in concessions for other industries; that he felt that the two companies had been treated unjustly.

(2) The President of George White & Sons Co. Limited, a specialty short-line manufacturer and distributor, located in London, Ontario, drew the Commission's attention to the problems his company faced in exporting several types of farm machinery to the United States. For example, his company had planned to develop a silage blower (used to fill silos) which would have been duty-free as a farm machine under the old U.S. tariff. However, it was ruled dutiable at 14 per cent as a blower, the all-encompassing descriptive item in the tariff which included all types of blowers, for fans, air conditioners and the like. Similar rulings had been received on two existing product lines, post-hole diggers and snow-blowers. Both items were designed to be attached to farm tractors. Both were exempt from duty coming into Canada, providing an end-use certificate from a farmer was provided. Later advice received by the Commission is that forage blowers are now ruled to be farm machines, and therefore duty-free going into the United States.

(3) A similar complaint was made to the Commission by the Vice-President and General Manager of McCoy-Renn Manufacturing Limited, another specialty short-line manufacturer from Calgary, Alberta. Grain-rollers were produced by this company to spread out and break down the individual grains used to feed cattle so that they would be more easily digestible. These had been ruled as dutiable at 10 per cent as flour-milling machinery, although similar machines from the United States came into Canada free. Small grain-rollers are now ruled to be farm machines, but the largest and most competitive model is still considered dutiable, no matter the actual end-use.

Another product produced by this company was a driven-type combine pick-up. The whole machine was allowed into the United States, but specially designed replacement parts for it were classified under the tariff sections relating particularly to them, and were therefore dutiable. Their combine pick-up was effectively less competitive as a result.

While it appears much has been done to help the individual firms who reported their problems to the Commission, certain conclusions can be drawn:

(1) The informal "free trade" approach taken by the Canadian Government towards farm machinery at the end of the war took the form of unilateral action only. It was intended to benefit Canadian farmers by removing the tariff on farm machines coming into Canada. It did nothing to ensure that the Canadian farm machinery manufacturer was given the same access to the U.S. market as the U.S. manufacturer was being given to the Canadian market.

(2) Between 1944 and 1963, the Canadian-U.S. tariffs roughly "matched", each allowing farm machines generally to enter duty-free on some basis or another. Parts were also covered. Where there were differences, the Canadian door was generally opened wider than the door to the United States. Materials for use in manufacturing farm machines, machine tools used exclusively for farm machines, and all forms of tractors including industrial tractors (except highway truck-tractors) could enter Canada free. All of these items except farm tractors were dutiable going into the United States.

(3) Under the U.S. tariff reclassification of 1963, certain doors previously open to Canadian manufacturers were closed. For some commodities, relief was secured by a Congressional amendment. The attitude of the U.S. Congress, however, became protectionist, and further revisions were not possible.

(4) The offer to negotiate concessions in other areas to compensate for rights lost in the tariff revision is meaningless to the companies that had built their business under existing export barriers and to the communities dependent on them. Legally, however, under GATT, the action of the U.S. Government was entirely correct. Other countries, such as the United States, have general legislation compensation or assistance from public funds to cover companies injured by tariff changes. In Canada, these arrangements have been limited until recently to specific industries, not including farm machinery.

(5) Faced with the existing situation, the only conclusion that can be reached is that the Canadian Government should initiate discussions with the U.S. Government towards the development of reciprocal, unconditional free trade in farm machinery. The arrangement should be broad enough to include new types of machines and parts, so that new items, like the combine loss monitor, would be included. In selling to Canada, other countries, including the United States, virtually have this free trade now, the only significant dutiable item of farm machinery being farm wagons and wagon gear. For the United States, the same holds largely true. Only "nuisance items" of duty remain, undoubtedly almost negligible in their protectionist effect but with unfortunate results for certain small manufacturers in Canada. No major U.S. interest would be prejudiced by permitting free access to *that* market for items like snow-blowers for farm use, grain-rollers, and binder and swather canvases. No significant volume of industrial tractors is currently made in Canada to threaten U.S. plants. It is desirable for Canadian manufacturers to be able to enjoy the economies of scale resulting from access to the total North American market that is open to manufacturers in the United States.

The result would be an equal, fully reciprocal duty-free arrangement between the two countries, giving each country's industry full access to the market of the other. Manufacturers would then be able to plan product development and production facilities on both sides of the border, knowing there would be equal access to both markets by treaty, rather than as the result of two unilateral declarations.

## Chapter 16

### LOCATIONAL ADVANTAGES IN THE FARM MACHINERY INDUSTRY IN NORTH AMERICA

This chapter examines the changes that have occurred in the location of the farm machinery industry in Canada and the United States over the period since 1900 and assesses some of the reasons for these changes. It then proceeds to a more detailed examination of the comparative cost advantages of three different locations—Brantford, the present centre of the eastern Canadian industry; Moline, Illinois, the centre of the United States industry; and Winnipeg, the centre of the area in Canada that has experienced the most rapid growth in recent years. An examination is also made of the comparative productivity of the industry in Canada and the United States. This analysis provides the basis for some conclusions about the Canadian industry's prospects in the years ahead.

For the most part, past locational changes are measured by using census data on the value of farm machinery shipments or production originating in different regions, states, or provinces. Shipments are not an ideal measure, because they include inter-plant shipments of components as well as finished products. However, shipments or production provide the only data available over the entire period and should be sufficiently accurate to establish the general pattern. Data limitations made it necessary to exclude farm tractors from the analysis prior to 1947. Separate consideration will be given to the location of tractor production later in this chapter.

Early in this century, changes in the location of farm machinery manufacture within Canada saw the growing dominance of Ontario, as Quebec's share declined from 11 per cent in 1900 to 2 per cent or less by 1929, and Ontario's share grew from 87 per cent to over 95 per cent (Table 16.1). A small but significant growth had occurred on the Prairies as early as 1910, but the Prairies' share of the industry's total output increased very slowly over the ensuing 30 years. Since 1945, however, there has been a marked shift towards the Prairies, and its share of total Canadian output increased from 3.5 per cent in 1947 to 13.8 per cent in 1963 and 19.4 per cent by 1967. Since the Second World War, Ontario's share has fallen moderately in percentage terms from just under 95 in 1947 to 83 in 1963 and 76.7

TABLE 16.1—PERCENTAGE SHARE OF EACH REGION OR PROVINCE IN THE VALUE OF TOTAL SHIPMENTS (OR PRODUCTION)  
FROM THE FARM MACHINERY INDUSTRY IN CANADA, SELECTED YEARS, 1900-67

Region or Province	(Percentage of value of total shipments)								
	1900	1910	1920	1929	1939	1947	1954	1963	1967
Atlantic	0.94	0.53	0.08	0.04	0.08	0.04	0.05	0.04	0.70 <sup>1</sup>
Quebec	11.26	4.92	4.54	2.07	2.12	1.68	1.41	2.54	3.19
Ontario	87.37	92.85	93.11	95.77	95.37	94.68	91.87	83.45	76.67
Prairies	0.40	1.68	2.06	2.10	2.41	3.53	6.42	13.85	19.40
Manitoba	0.40	1.65	1.72	1.85	2.32	2.25	4.36	9.93	14.92
Saskatchewan	—	0.03	0.07	0.04	—	0.13	0.53	1.52	2.33
Alberta	—	—	0.25	0.20	0.08	1.14	1.54	2.40	2.15
British Columbia	—	—	0.18	—	—	0.04	0.23	0.11	—
Total <sup>2</sup>	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

<sup>1</sup>Includes British Columbia. Data exclude tractors for all years except 1967.

<sup>2</sup>Totals may not equal 100 because of rounding.

Source: H. Schwartz, *Location of the Farm Machinery Industry in North America*, unpublished Commission study, 1969, and Commission estimates.

in 1967. Manitoba has been the major growth centre on the Prairies, and by 1963 accounted for almost 10 per cent of total Canadian output. Another significant development has been a small growth of output in the Atlantic region, accounted for almost entirely by a manufacturer of potato harvesting equipment. A recent upward trend in Quebec's share is also evident, from 1.4 per cent in 1954 to 3.2 per cent in 1967.

When these changes in the location of Canadian farm machinery output are examined in a North American context, a somewhat different pattern emerges. Thus, as the data in Table 16.2 reveal, Canada's share of total North American output reached a peak of just over 12 per cent in 1910, stayed near that level until 1929, and has since declined to around 8 to 9 per cent of the total. These changes in the Canadian share have been closely paralleled in Ontario's share of the total. The gradual increase in output on the Prairies is also evident in this table, but the rise is greatly reduced in magnitude, and by 1963 production on the Prairies in Canada still accounted for just over 1 per cent of the North American total.

Within the United States over the period from 1900-63 a pronounced westward and southward shift in the location of the industry can be seen. This is particularly evident in the decline in New York's share from 9.1 per cent in 1900 to 3.2 per cent in 1954, and Ohio's share from 12.2 per cent to 4.8 per cent over the same period. It is evident, too, in the share of Illinois which increased moderately from 1900-39 but has since fallen sharply from 45.3 per cent in 1939 to 25.5 per cent by 1954. Although its share of the total is much smaller, the pattern for Indiana has been similar to that for Illinois. In contrast, output in Iowa increased from 1.4 per cent to 9.8 per cent of the North American total between 1900 and 1954, and output in Minnesota from 1.5 to 4.8 per cent. Much of the growth in the West North-Central area has been relatively recent and this region's share of the total increased from 6.8 per cent in 1939 to 26.0 per cent in 1963. Within this last period, 1939-63, significant gains also occurred in the East South-Central region, especially in Tennessee, and to a lesser degree in the South Atlantic and Pacific regions. An exception to the general westward and southward shift of the industry has been the renewed growth of the industry in Pennsylvania. Its share increased from 1.5 per cent in 1939 to 6.0 per cent in 1954. This undoubtedly reflects the growth of New Holland, with its specialization in hay-harvesting and hay-handling equipment.

A comparison of Ontario's share of the North American total with the share of adjacent states in the United States such as Ohio, New York, and even Indiana and Illinois, suggests that up until recently, at least, Ontario has maintained its share of the total as well as or even better than her nearest neighbours in the United States. (However, if the data had included tractors, a somewhat different picture might have been obtained.) For the period before 1944, this can be attributed to Ontario's protected position in the Canadian market and to tariff preferences enjoyed in various parts of the British Commonwealth. Some of Ontario's gain in both the Canadian and North American market between 1900-10 undoubtedly

TABLE 16.2—PERCENTAGE SHARE OF EACH REGION, STATE OR PROVINCE IN THE VALUE OF TOTAL SHIPMENTS (OR PRODUCTION) FROM THE FARM MACHINERY INDUSTRY IN CANADA AND UNITED STATES (EXCLUDING FARM TRACTORS), SELECTED YEARS, 1900-63  
(Percentage of value of total shipments)

Region, State or Province	1900	1910	1920	1929	1939	1947	1954	1963
New England	1.28	1.14	0.49	0.33	0.47	0.33	0.03	0.17
Middle Atlantic	12.09	14.30	11.18	7.97	7.02	13.23	9.45	5.15
New York	9.12	10.01	8.79	6.42	5.40	7.72	3.20	
Pennsylvania	2.75	3.40	1.98	1.16	1.46	4.91	5.96	
East North-Central	69.36	60.82	65.17	65.48	71.36	52.23	48.76	46.09
Illinois	38.22	32.63	34.19	41.46	45.29	27.46	25.48	
Indiana	6.20	8.01	8.54	6.84	11.66	9.11	7.17	
Michigan	5.54	4.86	2.97	2.57	2.51	4.11	5.01	
Ohio	12.20	8.25	7.53	5.20	4.89	5.07	4.81	
Wisconsin	7.18	7.05	11.91	9.38	7.00	6.45	6.28	
West North-Central	4.24	6.65	4.55	8.67	6.80	16.09	18.61	26.04
Iowa	1.41	3.53	2.30	2.33	2.99	7.79	9.76	
Kansas	0.03	0.23	0.24	0.39	0.15	1.30	1.45	
Minnesota	1.53	1.64	0.77	3.70	2.53	4.52	4.84	
Missouri	0.83	0.55	0.44	1.48	0.45	0.82	1.53	
Nebraska	0.38	0.58	0.73	0.74	0.63	1.43	0.81	
South Atlantic	1.04	1.25	1.74	1.09	1.82	1.95	2.32	3.46
East South-Central	1.59	1.56	1.80	2.14	2.44	1.80	5.44	6.24
Kentucky	1.15	0.94	1.10	0.81	1.59	0.16	0.69	
Tennessee	0.39	0.52	0.65	1.30	0.79	0.88	3.59	

West South-Central	0.11	0.23	0.29	0.82	0.27	1.43	1.16	1.76
Mountain	0.07	0.19	0.17	0.08	0.12	0.58	0.57	0.74
Pacific	1.26	1.75	2.82	2.45	1.23	3.83	3.81	2.82
California	1.22	1.61	2.54	2.32	1.06	3.25	3.13	
United States	91.09	87.93	88.24	89.07	91.57	91.51	90.51	92.51
Atlantic	0.08	0.06	0.01	0.00	0.00	0.00	0.00	0.00
Quebec	1.00	0.59	0.53	0.22	0.17	0.14	0.13	0.19
Ontario	7.78	11.20	10.94	10.47	8.04	8.03	8.71	6.24
Prairies	0.03	0.20	0.24	0.23	0.20	0.30	0.60	1.03
British Columbia	-	-	0.02	-	-	0.00	0.02	0.00
Canada	8.91	12.07	11.76	10.93	8.43	8.49	9.49	7.49
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Note: Data for the United States in earlier years are for 1899, 1909, and 1919. Figures in italics may be selected data only from source in certain cases and therefore will not add to area totals.

Source: H. Schwartz, *Location of the Farm Machinery Industry in North America*, unpublished Commission study, 1969.



reflected her protected access to the rapidly growing Prairie market in Canada. Land under crops on the Prairies increased from 17 per cent of the Canadian total in 1901 to 49 per cent by 1911.

The competitive position of all Canadian producers has been affected by changes in the wage differential between Canada and the United States and by the variations that have occurred in the Canadian exchange rate. Also significant for the Canadian producers have been the changes in the relative importance of the domestic market, exports to the United States, and off-shore exports. In order to provide some perspective on the importance of these considerations, it will be useful to summarize briefly the tariff changes that have occurred in Canada and the United States since 1900 and the changing relative importance of these different markets. Some data will also be provided on wage differentials, adjusted for changes in the exchange rate.

#### **Tariff Changes in Canada and the United States Since 1900**

- 1907 Canadian tariff on harvesting implements reduced from 20 to 17½ per cent; 99 per cent drawback allowed on imported pig iron and rolled iron and steel used in implements manufactured for sale in Canada.
- 1913 United States tariff removed on all farm implements.
- 1914 Canadian tariff on harvesting machinery reduced from 17½ to 12½ per cent.
- 1918 Tractors priced below \$1,400 made duty-free (Canada).
- 1919 Canadian tariff on tillage equipment reduced from 20 to 15 per cent and tariff on plows, higher-priced tractors and portable engines reduced from 20 to 17½ per cent.
- 1922 Canadian tariff on harvest machinery reduced from 12½ to 10 per cent, on tillage equipment from 15 to 12½ per cent, and on plows from 17½ to 15 per cent.
- 1924 Canadian tariff on harvest machinery reduced from 10 to 6 per cent, on tillage machinery from 12½ to 7½ per cent, and on plows from 15 to 10 per cent. Pig iron, bar iron and bar steel were placed on the free list when imported for the manufacture of farm implements. Duties on all other materials used in farm implements were set at 7½ per cent.
- 1930 Canadian tariff on machinery raised to 25 per cent. Duties on farm tractors priced above \$1,400 raised from 17½ to 25 per cent. Tractors priced below \$1,400 remained duty-free.
- 1936 Effective January 1, 1936, tariffs on implements reduced from 25 to 12½ per cent on imports from the United States duties on all tractors were eliminated.
- 1936 As of May, duty on implements imported from the United States reduced from 12½ to 7½ per cent.
- 1944 Canadian tariff on farm machinery removed completely.

Thus, although the Canadian industry has had tariff-free access to the U.S. market since 1913, it is only since 1944 that the Canadian market has been free from tariffs for the U.S. manufacturer. Except for a brief period from 1930-35 when Canadian manufacturers enjoyed sharply increased protection in a highly depressed market, the trend of Canadian farm machinery tariffs over the period 1900-44 was generally downward, with the sharpest tariff reductions occurring over the period 1922-24. To some degree the tariff reductions occurring between 1907 and 1924 were offset as far as the industry was concerned by provisions for duty drawback or duty-free import of materials.

Some data on the changing importance of different markets for the output of the Canadian farm machinery industry are given in Table 16.3. Over the period since 1900 there has been a persistent if somewhat irregular growth in the significance of the export market, and a corresponding decline in the share of the industry's output sold in the domestic market. Thus, exports as a percentage of farm

TABLE 16.3—DESTINATION OF CANADIAN PRODUCTION OF FARM MACHINERY, SELECTED YEARS, 1900-67

	Exports to United States	Exports to Other Countries	Total Exports	Domestic Sales
(Percentage of Canadian production)				
1900	—	17	17	83
1910	1	18	19	81
1923	5	18	23	77
1928-30	11	30	41	59
1937-39	14	3	17	83
1946-48	32	20	52	48
1953-55	45	14	59	41
1963-66	67	6	73	27
1967	71	4	75	25

Source: Calculated from Dominion Bureau of Statistics data. Exports in 1900, 1910, and 1923 are for fiscal years closest to calendar years. (See also Table A.7.)

machinery production in Canada rose from 17 per cent in 1900 to 23 per cent in 1923, dropped to 17 per cent in 1937-39, and reached a new peak of 75 per cent in 1967. As the reverse side of this pattern, there has been a decline in the Canadian sales percentage from 83 in 1900 to 25 by 1967. For exports, there has been a gradual increase in the importance of the U.S. market and a decline in the share of Canadian output sold in other export markets. Canadian exports to the United States, which were negligible in 1900 and less than 1 per cent to Canadian output in 1910, amounted to 5 per cent in 1923, 11 per cent in 1928-30, 32 per cent in 1946-48, and 71 per cent in 1967. Exports to the rest of the world were of growing importance to Canadian manufacturers of farm equipment from 1900 until 1928-30, increasing from 17 per cent to 30 per cent of total output over this period. Since 1930 these exports have declined steadily in importance and in 1967 accounted for only 4 per cent of Canadian output.

Both the reduction in tariff protection and the declining importance of Canadian off-shore exports help to explain the decline in Ontario's share of North America's output. The increasing importance of Canadian exports to the United States has also tended to favour the Prairies as a location for farm machinery output relative to Ontario.

The above census data, for farm machinery excluding tractors, show a significant decline in the Canadian share of North America's total production from a peak of around 12 per cent in 1910 and 1920 to about 7.5 per cent by 1963. For the postwar period, a year-by-year comparison of the Canadian share of total production including tractors is possible, using the data given in the Commission study on productivity prepared by Christopher J. Maule.<sup>1</sup> This comparison, which is presented in Table 16.4, shows that although there has been a modest decline in the Canadian share compared with the early postwar period when Canada still had a significant off-shore export market, this share has remained fairly constant since 1955. Moreover, the results obtained are not greatly different whether the Canadian share is measured by the value of shipments or by value added. The decline as compared with the early postwar years has been slightly larger where the share is measured by value added than when value of shipments is used.

TABLE 16.4—CANADA'S AVERAGE ANNUAL SHARE OF NORTH AMERICAN FARM MACHINERY PRODUCTION, 1947-66  
(Canada as percentage of North American total)

	<u>Value of Shipments</u>	<u>Value Added by Manufacture</u>
1947-49	7.9	8.8
1950-54	8.1	8.9
1955-59	6.8	7.6
1960-63	6.6	7.4
1964-66	7.4	7.5

Source: C. J. Maule, *Productivity in the Farm Machinery Industry: A Comparative Analysis between Canada and the United States*, Study No. 3, Royal Commission on Farm Machinery (Ottawa: Queen's Printer, 1969), Tables A5 and A6.

When the above data are compared with the longer historical series presented in Table 16.2, it becomes apparent that both series show about the same share of production for Canada. The earlier series shows a share of 8.5 per cent in 1947, 9.5 per cent in 1954, and 7.5 per cent in 1963—not greatly dissimilar from the data for this period in Table 16.4. Yet the latter table includes tractors as well as other farm machinery, whereas the former table excludes tractors. Since Canada has very little tractor production, one would expect the data in Table 16.4 to show a much smaller share of the market going to Canadian producers. This apparent anomaly is explained by the fact that the data given in Table 16.4 incorporate the effects of the upward valuation of Canadian shipments and value-added data needed to place

<sup>1</sup> C. J. Maule, *Productivity in the Farm Machinery Industry: A Comparative Analysis between Canada and the United States*, Study No. 3, Royal Commission on Farm Machinery (Ottawa: Queen's Printer, 1969).

both United States and Canada on a comparable basis. The earlier series presented in Table 16.2 probably gives a valid indication of the long-term trend. However, the series in Table 16.4 provides a much better measure of the recent trend in the Canadian share of North American farm machinery production. Not only does it include tractors and a correction for the undervaluation of published Canadian data, but because it is based on annual averages it is less vulnerable to the effects of unusual year-to-year variations. In brief, these data show that the Canadian industry currently makes about 7.5 per cent of the farm machinery produced in Canada and the United States. This represents a modest decline from the 8 to 9 per cent share for the period 1947-54.

A general picture of the farm machinery market in North America is provided by Figures 16.1, 16.2, and 16.3,<sup>2</sup> which show the distribution of tractors, combines, and balers, on farms in Canada for 1966 and the United States for 1964. These maps indicate quite clearly that locations such as Moline, Illinois, Des Moines, Iowa, and Milwaukee, Wisconsin—the regions in which many North American plants are located—are very close to the centre of the North American market.

#### **Locational Advantages of Brantford, Moline, and Winnipeg**

One approach to assessing the competitive advantage of different locations for the manufacture of farm machinery is to carry out the detailed kind of plant-location study that is normally prepared when a farm machinery firm is considering establishing a new plant. In such a study all the various costs that affect the relative advantages of different locations are studied in detail. Such a study was prepared by the Commission's staff for Brantford, Moline, and Winnipeg.<sup>3</sup> In assessing the comparative advantages of these three locations, it was assumed that the farm machinery would be sold entirely in Canada or the United States. Since Canadian exports to other countries now account for only 3 per cent of her annual output, and U.S. exports outside North America amount to only about 6 per cent of U.S. output, it seems reasonable to neglect the effect that potential sales to third markets would have on the location decision. Comparison of these three locations is further facilitated by the fact that they now all produce self-propelled combines, one of the industry's major products.

In making this comparison it was assumed that all three points were producing the same products in the same volume, were using the same technology, and employed the same amount of materials, labour, and capital equipment. Thus the plants were assumed to be virtually identical. To some degree, the technology and

<sup>2</sup> Prepared for the Royal Commission on Farm Machinery by Professor D. M. Anderson and Professor D. R. F. Taylor of the Geography Department of Carleton University, Ottawa. Data taken from analysis of 1966 *Census of Canada, Agriculture*, and United States 1964 *Census of Agriculture*.

<sup>3</sup> N. B. MacDonald, *Locational Advantages in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 6 (Ottawa: Queen's Printer, 1970).

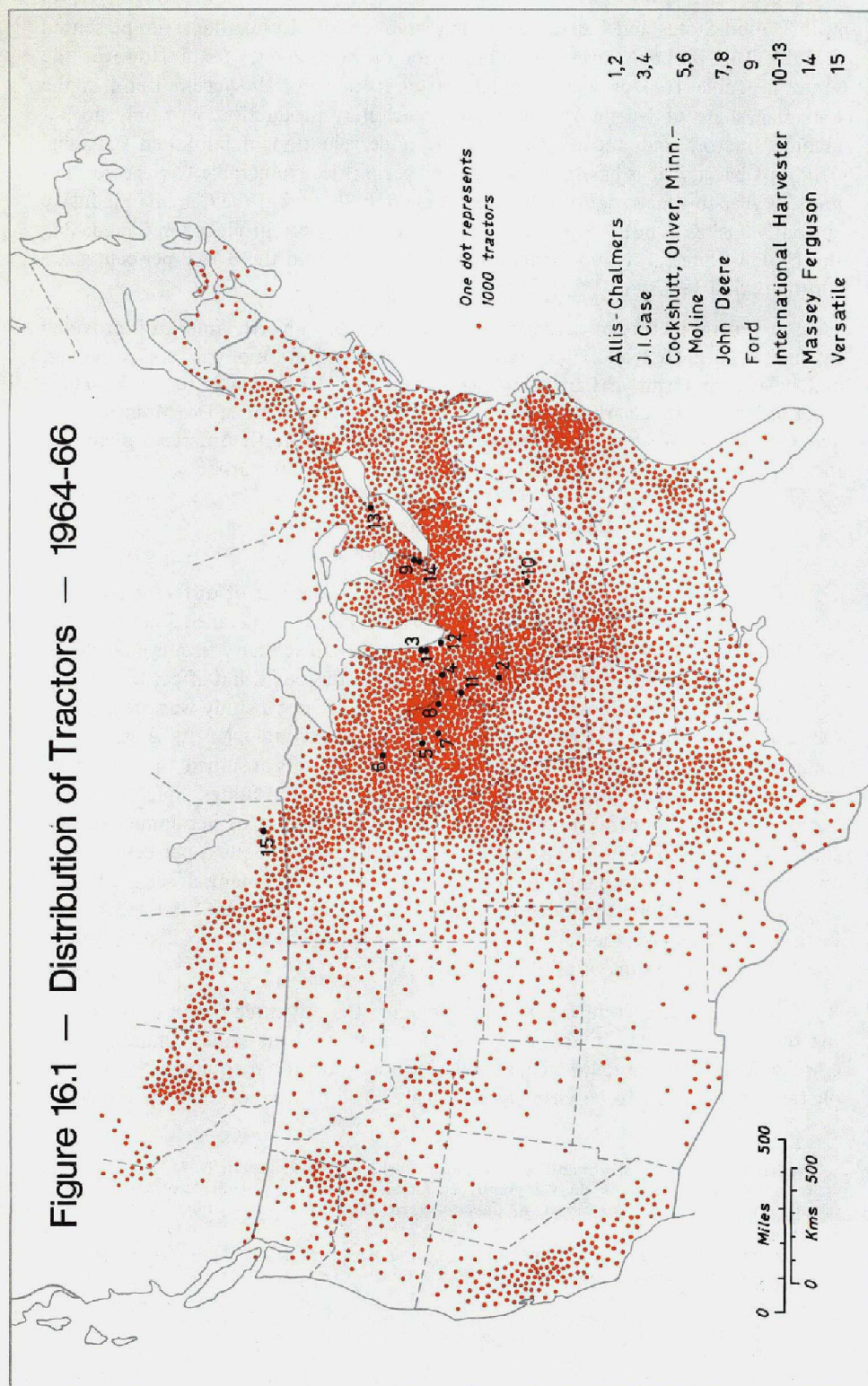
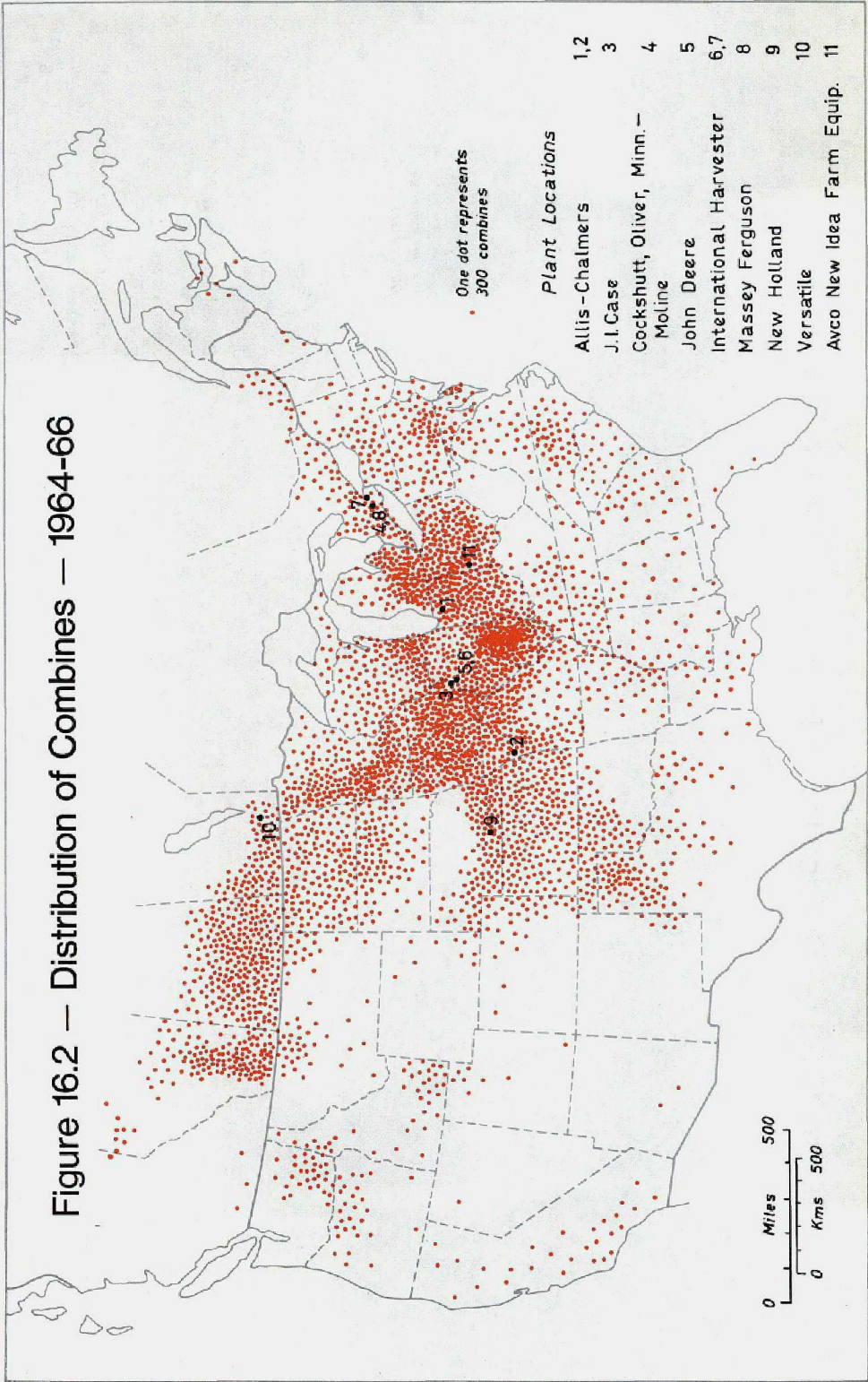
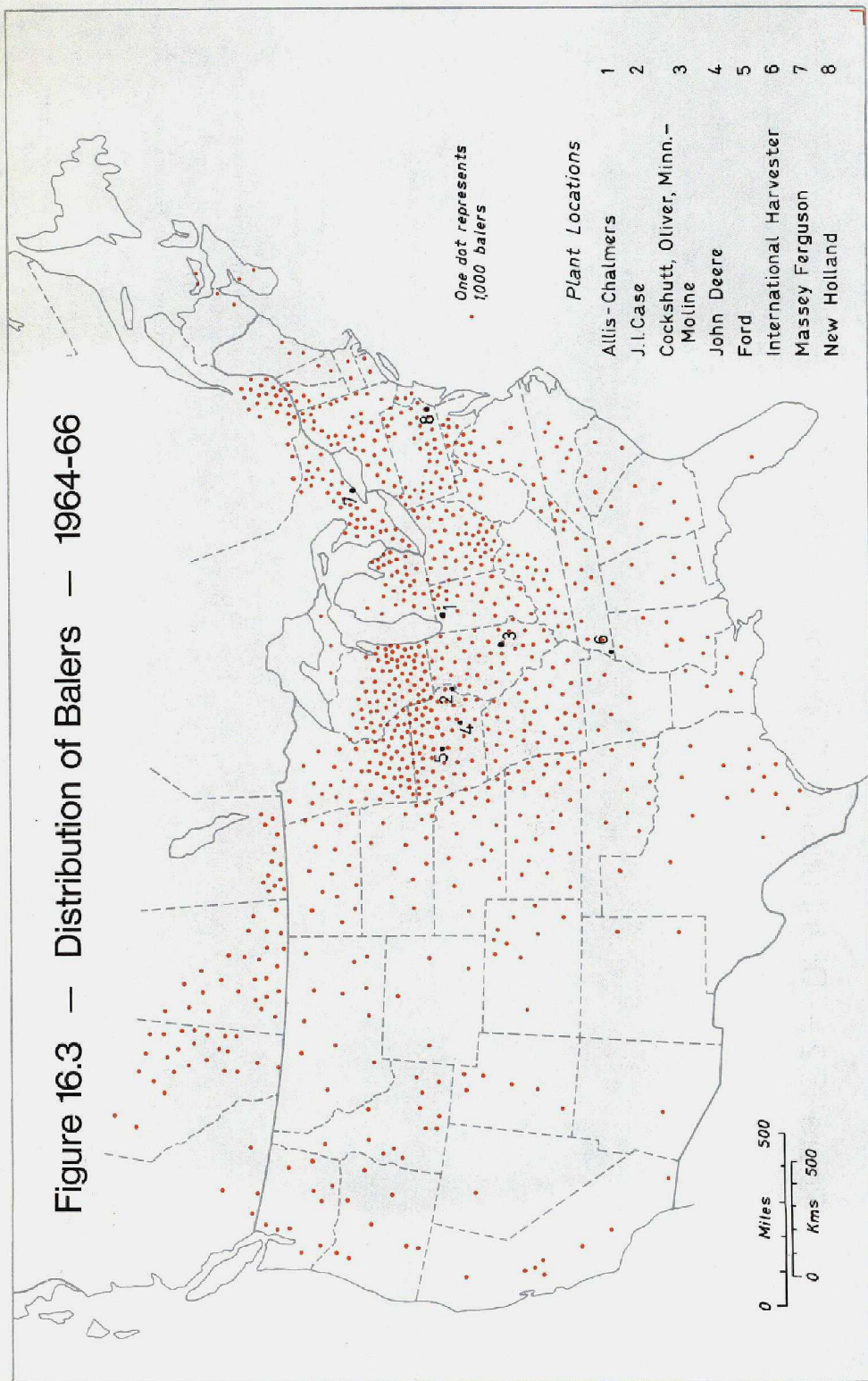




Figure 16.2 — Distribution of Combines — 1964-66







production processes in different locations are, in fact, adapted to the relative prices of labour, capital, and materials. However, for the price differences that exist between these three locations, it was believed that there would be no significant modifications in production processes or technology. It was also assumed that costs and profits related to wholesaling and retailing, other than outbound transportation, would have no effect on plant location.

Cost data collected by the Commission indicate that the manufacturer's factory costs, including profit, amount to about 61 per cent of the suggested retail list price of farm machinery or about 84 per cent of the net price to the dealer. The costs affecting the location decision are within the 61 per cent. In the following analysis, these total factory costs will be considered in two groups, (1) manufacturing costs (roughly 54 per cent of retail list) and (2) other costs associated with the manufacturing location including outbound transportation costs and costs of income taxes. These latter costs will be labelled post-production costs.

### **Manufacturing Costs**

With the quantities of materials, labour, and capital used at different locations assumed to be fixed, variations in manufacturing costs will mainly reflect differences in material prices or in salary and wage rates, differences in overhead costs such as property tax rates, and variations in inbound transportation costs. As a basis for judging the importance of different costs, the manufacturing cost data for four major Canadian farm machinery manufacturers were used. These data are presented in Table 16.5. The four firms in question—Massey-Ferguson, International Harvester, Cockshutt, and John Deere—manufacture in their Southwestern Ontario plants a variety of farm machines including combines, hay-balers, tillage equipment, drills, swathers, manure spreaders, and rotary mowers. Thus the cost data reflect the cost pattern of a broad range of farm machines (with the exception of tractors) for a plant located in Southwestern Ontario, referred to in the study as "Brantford". These data give the following breakdown of manufacturing costs: materials 53 per cent, direct labour 16 per cent, and overheads 31 per cent. The importance of each of these groups for the location decision is now considered in detail.

*Costs of Acquiring Materials and Components* – The Canadian farm machinery industry can import both materials and components on a duty-free basis. Thus, Canadian plants are free to take advantage of the cheapest source for any material or component. Indeed, in respect to materials, Canadian plants may sometimes have an advantage over plants in the United States. For example, in 1969, steel was lower in price in Canada than in the United States by amounts ranging from 5 to 12 per cent. Thus Canadian farm machinery plants would buy Canadian steel. However, U.S. farm machinery plants do not have similar duty-free access to Canadian materials and components. If a material or component is not specifically mentioned in the U.S. tariff, it can be imported duty-free as a part for a farm implement. But wherever the material or component is specifically covered in the tariff, the U.S. firm would have to pay duty on its import. No



TABLE 16.5—BREAKDOWN OF MANUFACTURING COSTS IN ONTARIO, FARM MACHINERY INDUSTRY, 1966 (AVERAGE OF FOUR COMPANIES)

	Percentage of Total Manufacturing Costs
<u>Materials</u>	
Purchased items	52.02
Inbound transportation	0.98
Total materials	<u>53.00</u>
<u>Direct Labour</u>	
Wage costs	12.11
Fringe benefits	3.92
Total direct labour	<u>16.03</u>
<u>Overheads</u>	
Indirect labour (including fringes)	7.52
Salaries (including fringes)	6.88
Maintenance	3.11
Depreciation	2.28
Warehousing and freight	1.82
Production tooling	1.49
Obsolescence, warranty	1.49
Administration	1.36
Power, light, heat, etc.	1.09
Operating supplies	1.08
Property taxes	0.84
Expense, tools	0.70
Defective work and scrap	0.63
Insurance	0.06
Other	0.62
Total overheads	<u>30.97</u>
Total manufacturing costs	<u>100.00</u>

Source: N. B. MacDonald, *Locational Advantages in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 6 (Ottawa: Queen's Printer, 1970), Table 3.1, p. 16.

specific allowance for this advantage of Canadian plants is included in this analysis. Since purchased components make up over half of the total manufacturing cost of farm machinery, it could be a rather important factor. If it were assumed that steel accounted for 40 per cent of purchased components and that Canadian plants had a 7.5 per cent price advantage on steel, the result would be an advantage on total manufacturing costs of 3 per cent. However, this potential advantage was not further considered in the study.

Apart from these differences that plants in North America have in their purchase of materials and components, the major difference in these costs that one location may enjoy over another is in respect to inbound transportation costs. These inbound transport costs may vary from one location to another for a number of reasons—the type of transport that is available (highway, rail, or ship), the minimum shipping weights required, and the rate structures themselves. Moreover, transport costs may be affected by basing-point practices (a form of freight-cost

equalization), free delivery (the vendor pays the freight or uses his own trucks) and inventory control and associated costs (as the distance from the vendor increases, the "safety float" of materials inventory en route or in the plant must be increased). The variety and complexity of these factors make it difficult to be as precise in measuring inbound transport costs as is possible with other cost items.

In its submission to the Commission, Massey-Ferguson presented an analysis of the difference in the costs of locating a tractor-assembly plant and its supporting transmission and axle plant in Brantford rather than Detroit. The company also presented an analysis of the costs involved in locating their Brantford combine-assembly plant in Winnipeg instead of Brantford. In both instances, a substantial part of the cost difference between these locations reflected the additional cost of inbound transportation on materials and components. These and other data provided by the company were analyzed in some detail, and are the basis for the comparison of inbound freight costs presented in Table 16.6. The results of this analysis show that the cost of bringing in materials and components, expressed as a percentage of Brantford's total manufacturing cost as a base, would amount to about 0.98 per cent in Brantford, 2.16 per cent in Winnipeg, and 0.44 per cent in Moline (taken as equal to Detroit). These cost comparisons are made on the assumption that a Winnipeg plant would continue to buy its raw materials and components from the same sources as the present Brantford combine plant, and that a Brantford tractor plant would buy most of its materials and components from the same suppliers as the Detroit plant. To some degree this will overstate the disadvantages of the Brantford and Winnipeg locations. On some materials or components there would be an opportunity to substitute local or closer suppliers and thus reduce costs.

Associated with the purchase of materials and components are certain indirect cost penalties that cannot be easily measured. Where components or materials have to be obtained from a distant source, the manufacturer can expect to spend more in the form of office overhead to secure the same control over his product as a manufacturer who can buy locally. When the material or parts cross the border, a further cost is added. Each shipment of parts received by a Canadian farm machinery manufacturer must have a customs entry form completed, even though the parts themselves are duty-free. It has been estimated that the cost of completing each such form is at least five dollars. However, because these additional costs are relatively small, no specific allowance is made for them in the present cost comparison.

*Costs of Hourly Paid and Salaried Personnel* – Table 16.7 gives data on wage and salary rates and fringe benefits for direct labour, indirect labour, and salaried employees, for each of the three locations. The relative importance of each of these components of manufacturing costs in 1966 is shown in this table. The data are given both in terms of Canadian dollars and on a relative index-number basis with Brantford taken as equal to 100, and are for rates in effect during 1966.

TABLE 16.6—COMPARISON OF INBOUND FREIGHT COSTS AT  
BRANTFORD, ONTARIO, WINNIPEG, MANITOBA,  
AND MOLINE, ILLINOIS, AS PERCENTAGE OF  
BRANTFORD MATERIAL COSTS

	<u>Brantford</u>	<u>Winnipeg</u>	<u>Moline</u>	Relative to Material Percentage, Table 16.5 (Per cent)
	(Thousands of dollars)			
<u>Brantford, Ontario</u>				
Inbound freight costs reported in Massey-Ferguson brief (p. 37, Ch. VII) for all Canadian M-F plants—taken as typical of Brantford location:				
Material costs	\$70,334			52.02
Freight costs	<u>1,323</u>			<u>0.98</u>
Total	<u>\$71,657</u>			<u>53.00</u>
<u>Winnipeg, Manitoba</u>				
Inbound freight costs reported in Massey-Ferguson brief (p. 24, Ch. IV) for Winnipeg as opposed to Brantford location:				
Material costs		\$70,334		52.02
Freight costs at Brantford		<u>1,323</u>		
Additional freight costs for Winnipeg location of combine plant		<u>1,600</u>		
Freight costs		<u>2,923</u>		<u>2.16</u>
Total		<u>\$73,257</u>		<u>54.18</u>
<u>Detroit, Michigan (used for Moline, Illinois)</u>				
Inbound freight costs—Brantford as 2.21 times Detroit freight:				
Material costs		\$70,334		52.02
Freight costs (\$1,323 ÷ 2.21)		<u>599</u>		<u>0.44</u>
Total		<u>\$70,933</u>		<u>52.46</u>

Source: From N.B. MacDonald, *Locational Advantages in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 6 (Ottawa: Queen's Printer 1970), Table 3.3, p. 24.

These data show a very considerable advantage for Winnipeg over both Brantford and Moline in respect to labour costs. Winnipeg's advantage is particularly marked in respect to fringe benefits. Winnipeg's wage and salary rates are from 19 to 31 per cent below those in Southern Ontario (taken as Brantford) and her total fringe benefits would be less than one-fourth of the Brantford level.

Overall, using the weights given in Table 16.7, Winnipeg has an advantage of 39 per cent on salary and wage costs. In contrast, wage rates, salaries, and fringe benefits are higher in Moline than in Brantford. The differential is much larger for salaries and indirect labour than it is for direct labour. A weighted average of all these rates shows that Moline's labour costs in 1966 were about 21 per cent higher than those

TABLE 16.7—COMPARISON OF AVERAGE WAGE AND SALARY RATES,  
THE FARM MACHINERY INDUSTRY,  
CANADA AND UNITED STATES, 1966  
(Canadian dollars)

	Canada		United States
	Brantford Ontario	Winnipeg Manitoba	Moline Illinois
<b>Direct Labour Wage Rates</b>			
Average hourly wage rate	2.81	1.93	3.21
Hourly fringe benefit cost	0.91	0.20	0.98
Total direct labour cost	3.72	2.13	4.19
<b>Compared to Brantford as 100</b>			
Average hourly wage rate	100	69	114
Hourly fringe benefit cost	100	22	108
Total direct labour cost	100	57	113
<b>Indirect Labour Wage Rates</b>			
Average hourly wage rate	2.70	2.01	3.50
Hourly fringe benefit cost	0.87	0.21	1.07
Total indirect labour cost	3.57	2.22	4.57
<b>Compared to Brantford as 100</b>			
Average hourly wage rate	100	74	130
Hourly fringe benefit cost	100	24	123
Total indirect labour cost	100	62	128
<b>Salary Rates</b>			
Average weekly salary rate	81.06	65.54	111.97
Average salary fringe benefits	26.26	6.75	34.15
Total salaried employment costs	107.32	72.29	146.12
<b>Compared to Brantford as 100</b>			
Average weekly salary rate	100	81	138
Average salary fringe benefits	100	26	130
Total salaried employment costs	100	67	136

Source: Wage and salary rates from returns of *Survey of Wages*, Department of Labour for Canada, and from *Wage Survey*, U.S. Department of Labor, Bureau of Labor Statistics. Fringe benefit data were collected from five Canadian and eight U.S. companies by the Commission. N.B. MacDonald, *Locational Advantages in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 6 (Ottawa: Queen's Printer, 1970), Table 3.4, p. 26.

in Brantford and almost double those in Winnipeg. Taking total manufacturing costs in Brantford as 100, total labour cost in Brantford would be 30.43, in Winnipeg 18.49, and in Moline 37.03. Wage increases between 1966 and 1968 changed these relationships by only moderate amounts. In terms of 1968 salary and wage rates, total labour cost for Moline was about 18 per cent higher than in Brantford and about 92 per cent higher than those in Winnipeg. Again using total manufacturing costs in Brantford as 100, total labour cost would be 33.28 in Brantford, 20.38 in Winnipeg, and 39.16 in Moline. Data on 1968 salary and wage rates are given in Table 16.8.

TABLE 16.8—COMPARISON OF AVERAGE WAGE AND SALARY RATES,  
THE FARM MACHINERY INDUSTRY,  
CANADA AND UNITED STATES, 1968

(Canadian dollars)

	Canada		United States
	Brantford Ontario	Winnipeg Manitoba	Moline Illinois
<b>Direct Labour Wage Rates</b>			
Average hourly wage rate	3.19	2.21	3.44
Hourly fringe benefit cost	1.03	0.23	1.05
Total direct labour cost	4.22	2.44	4.49
<b>Compared to Brantford as 100</b>			
Average hourly wage rate	100	69	108
Hourly fringe benefit cost	100	22	102
Total direct labour cost	100	58	106
<b>Indirect Labour Wage Rates</b>			
Average hourly wage rate	3.11	2.36	3.78
Hourly fringe benefit cost	1.01	0.24	1.15
Total indirect labour cost	4.12	2.60	4.93
<b>Compared to Brantford as 100</b>			
Average hourly wage rate	100	76	122
Hourly fringe benefit cost	100	24	114
Total indirect labour cost	100	63	120
<b>Salary Rates</b>			
Average weekly salary rate	92.30	75.30	131.60
Average salary fringe benefits	29.90	7.80	40.10
Total salaried employment costs	122.20	83.10	171.70
<b>Compared to Brantford as 100</b>			
Average weekly salary rate	100	82	143
Average salary fringe benefits	100	26	134
Total salaried employment costs	100	68	141

Source: N.B. MacDonald, *Locational Advantages in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 6 (Ottawa: Queen's Printer, 1970), Table 3.5, p. 27.

The data on labour cost shown in the above comparison are based on wages and salaries actually paid in farm machinery plants in the three different areas. The disparity between Winnipeg and Brantford in these data is substantially larger than is true for an average of all industries in the two areas. This is due to the fact that as compared with Winnipeg, farm machinery in Southern Ontario is produced by much larger firms, and firms in which a larger proportion of the workers is in strong union organizations. If firms in the Winnipeg area continue to grow in size, or if some of the major companies establish plants in the region, some of the wage advantages that now accrue to the area may disappear. In these circumstances, unions in other locations could be expected to resist the erosion to their position by lower labour cost in Winnipeg.

*Labour Productivity* — Salary and wage rates and the level of fringe benefits are only a valid measure of relative labour cost per unit of output if the level of labour productivity is the same in each location. Further, even if labour productivity is higher in one location than another, and as a result unit labour costs are lower, the effect of this on total unit costs may be wholly or partially offset if these productivity gains are achieved by the use of more capital equipment. While labour productivity is difficult to measure with any precision, it will be useful to review what evidence is available on this question.

An earlier study published by the Royal Commission on Canada's Economic Prospects estimated that productivity measured by value added per worker in the farm machinery industry in Canada was only about 68 per cent of that in the United States. The comparative study on productivity undertaken for the Commission<sup>4</sup> discovered that there were serious deficiencies in the data on which this earlier estimate had been based. This error arose out of the fact that the value of shipments was being reported on a different basis in Canada than it was in the United States. In fact, a significant part of the Canadian industry's output was reported at standard factory cost, a basis which does not include an allowance for profit at the manufacturing level. In contrast, in the United States many shipments were reported at a valuation equal to about two-thirds of the suggested retail price. This basis of valuation was used particularly by the full-line firms which sold farm machinery through their own branch-house organization. For these firms, the price of machinery at the factory is just a transfer price, a price at which goods are transferred from one branch of the organization to another.

When the Canadian data were adjusted to a valuation basis more closely approximating that used in the United States, the result was a significant increase in the value added per worker in Canada. For the period studied, 1947-66, the results show that the productivity of employees in the Canadian industry is of the order of 80 to 83 per cent of that achieved in the American industry. Three alternative measures produced the results shown in Table 16.9.

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<sup>4</sup> Maule, *op. cit.*

TABLE 16.9—PRODUCTIVITY IN THE FARM MACHINERY INDUSTRY, CANADA AS PERCENTAGE OF THE UNITED STATES

	Per Production Worker	Value Added in Current Dollars per Employee	Per Man-Hour Paid, Production Workers
1947-51	82.4	80.8	82.6
1952-59	83.1	84.1	82.1
1960-66	78.0	78.0	79.7
1952-66	80.5	81.2	80.9

Source: C.J. Maule, *Productivity in the Farm Machinery Industry: A Comparative Analysis between Canada and the United States*, Royal Commission on Farm Machinery, Study No. 3 (Ottawa: Queen's Printer, 1969), Table 7.

It has not been possible to establish precisely what factors account for the remaining 17 to 20 per cent difference in productivity between Canada and the United States. In testimony before the Commission, Massey-Ferguson expressed the view that Canadian workers were just as productive as American workers. However, it also reported that its U.S. manufacturing operations were more capital-intensive than was true for Canada. For its manufacturing and engineering divisions in a number of different countries, Massey-Ferguson reported the following investment in assets per employee: Canada \$8,100, United States \$22,300, Europe \$7,000, Australasia \$4,400, Latin America \$10,950, and Africa \$5,100. Thus some of the higher productivity reported for the United States may reflect the fact that manufacturing operations there are more capital-intensive, and as a result each worker is working with a larger amount of capital equipment.

Although the Maule study showed productivity levels for Canada from 80 to 83 per cent of U.S. levels, it was decided somewhat arbitrarily to base the analysis in this section on the assumption that labour productivity levels for Brantford and Winnipeg would be, respectively, 93 and 90 per cent of those for Moline. The present analysis assumes production of identical products in identical plants. In these circumstances, it seems unlikely that a productivity difference as large as 17 or 20 per cent would occur. Nevertheless, in a concluding section some attention is given to the effects of alternative productivity assumptions. Both higher and lower productivity levels will be considered.

Massey-Ferguson also reported that following the removal of its Woodstock operation to Des Moines, Iowa, it obtained "increased efficiencies including substantially improved work standards of approximately 40 per cent in assembly and 50 per cent in welding with an over-all increase of output per man-hour judged to be between 10 and 15 per cent". They also stated that "Such an improvement might have arisen entirely from improved facilities and manufacturing methods, a new employee work group and improved work standards, regardless of location". Thus some of the remaining productivity difference between Canada and the United States may reflect some of these factors. It may be noted that as the largest

Canadian manufacturer, Massey-Ferguson, still has a substantial part of its production concentrated at a very old factory site in Toronto.

Productivity as measured by value added reflects the price at which the product sells. If the products of all firms have about the same value in the eyes of the customer and are equally well located to serve the market this should give a good measure of productivity. But to the degree that some firms have built up over the years a reputation for their brand name that allows them to charge a higher price, the productivity of these firms measured by value added will contain an element which does not reflect productivity in any physical sense. Similarly, where firms located away from the centre of the market have to accept a lower net price at the factory, their value added per worker will be lower. Both of these considerations may have some influence on the comparison of productivity between Canada and the United States. The largest Canadian manufacturer, Massey-Ferguson, is currently attempting to increase its market penetration in the United States and may well be accepting lower prices for equivalent products in order to achieve this goal. Certainly, Commission studies suggest that both Cockshutt and Massey-Ferguson combines, for equivalent sizes and models, sell at prices significantly below the prices of comparable combines sold by Deere and International Harvester, the two dominant firms in the U.S. market. Combines for the former two companies are manufactured in Canada, while those for the latter two are manufactured in the United States. And the major part of Canadian production must accept some transport-cost penalty.

Finally, it should be noted that productivity depends to a significant degree on the scale of production at which a plant operates. Thus the data provided by the Commission's study on *Farm Tractor Production Costs* show that productivity of both labour and capital increase very substantially when production increases from 20,000 to 90,000 tractors per year. For a variable make-buy mix of tractors, value added increases by 57 per cent per employee, by 45 per cent per production worker, and by 85 per cent per \$1,000 of invested capital, over the range from 20,000 units to 90,000. The data are as follows:

	Annual Output of Factory		
	20,000	60,000	90,000
Value added per employee	\$14,714	\$19,762	\$23,093
Value added per production worker	20,887	26,945	30,187
Value added per \$1,000 of capital	423	652	782

To the degree that farm machinery plants in the United States operate at higher-volume levels their productivity in terms of value added would be higher. Since Canadian plants in many cases produce for the entire North American market, it is not obvious that American plants do achieve larger economies of scale. However, tractor production in North America is almost entirely in the United States and tractors are one of the larger-volume farm machines. Rough estimates made by the Commission indicate that economies of scale available in tractors may



account for around 3 percentage points of the difference in productivity in this industry between Canada and the United States. Economies of scale in other products may account for some of the remaining difference.

*Labour Supply* – An important consideration in deciding where to locate a farm machinery manufacturing facility is the availability of labour of the desired skills and quality. New Holland reported that before deciding to locate a new combine manufacturing plant at Grand Island, Nebraska, they had given serious consideration to Winnipeg as an alternative site. In deciding against Winnipeg they reported that an important factor had been the lack of tool and die makers in the Winnipeg area. They had estimated their requirements for this class of worker as 20 initially and 33 in the first five years and they had found that there were only 52 in all of Manitoba. They also reported that with the new technical school training facilities which had recently been made available, they would have been able to arrange to have the needed supply of workers trained. Both Moline and Brantford are in major manufacturing areas and could be expected to have workers available with the required skills. It would appear that the quality of Winnipeg's labour supply is improving and in the future may well be adequate to meet most normal requirements of any new farm machinery manufacturer. All three areas under consideration would appear to have the school, community, and recreational facilities needed to attract the important salaried supervisory and executive class of worker. New Holland also noted that Canadian workers were less willing than U.S. workers to move from one job to another. This would make the initial staffing of a new factory difficult, but would be an advantage once the plant was operating.

*Overhead Costs* – Salaries and the wages of indirect labour are an important component of overhead costs, but these were considered above along with the wages of direct labour. Operating supplies used directly in the production process such as drill bits, thinners and solvents for paints, sand paper, welding rods and gases, make up about 1 per cent of manufacturing costs. These items can be imported on a duty-free basis by a Canadian manufacturer of farm machinery, and are free of federal sales tax. Since 1969, the Ontario sales tax of 5 per cent has applied to operating supplies. In Illinois these supplies would be free of both state and federal sales tax, although in adjacent Iowa they would be subject to a 3 per cent state tax.

Production tooling and expense tools, which together amount to about 2.2 per cent of total manufacturing costs, are tax-free at both the provincial and federal level. In the United States they would pay a 5 per cent state tax in both Iowa and Illinois.

Power, light and heat, accounting for just over 1 per cent of manufacturing cost, can be broken down on the basis of Canadian census data into electricity (42.5 per cent), natural gas (25.9 per cent), fuel oil (16.3 per cent), and coal (15.3 per cent). The relative cost of each of these components and a weighted average of all four for each of the three locations are given in Table 16.10.

TABLE 16.10—POWER, LIGHT AND HEAT COST, THREE FARM MACHINERY LOCATIONS (BRANTFORD = 100)

	Relative Percentage Weights	Brantford	Winnipeg	Moline
Gas	25.9	100.0	91.23	108.77
Electricity	42.5	100.0	59.31	208.57
Fuel oil	16.3	100.0	89.24	111.96
Coal	15.3	100.0	161.46	92.78
Weighted average		100.0	88.08	149.25
With cost weight of "power, light, heat, etc." in Table 16.5 taken as Brantford level		1.09	.96	1.63

Sources: N.B. MacDonald, *Locational Advantages in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 6 (Ottawa: Queen's Printer, 1970), Ch. 3, p. 35.

For a number of other components of overhead costs it seems likely that costs would be about the same in all three locations. This would be true of defective work and scrap, obsolescence, and warranty and insurance. For lack of definite data it was also assumed that property taxes, which are less than 1 per cent of manufacturing costs, would be identical in all three locations.

Data on maintenance, taken from *Farm Tractor Production Costs* indicate that this cost item is made up of about two-thirds labour and one-third materials. Maintenance costs were then estimated on the assumption that materials costs would be identical in all three locations and labour costs would vary by the ratios shown above for indirect labour.

Another important component of cost is depreciation on plant and equipment. Available data suggest that about 70 per cent of this total is for depreciation on machinery. Except for a short period, Canadian manufacturers have been able to buy their equipment on a tax-free basis, and the farm machinery industry can import machinery free of duty. On the other hand, evidence given to the Commission by the Ford Motor Company suggests that the cost of a new building in Canada would be some 7 per cent higher than a comparable building in the United States, largely because of the 11 per cent sales tax on building materials. Another source suggested that building costs in Southern Ontario were about 9 per cent lower than in Moline, with Winnipeg a further 2 per cent lower. After assessing these data, factors of 100, 97 and 94 were chosen for Brantford, Winnipeg, and Moline, respectively, to represent relative building-cost levels.

Two other cost areas are warehousing and freight, and administration. With Brantford taken as 100, both of these costs were assumed to be about 90 in Winnipeg on the basis of their nearness to the Prairie market and the lower wage and salary level in the region. For Moline, which is also closer to the centre of the farm machinery market, but must pay higher labour rates, factors of 95 and 99 were selected.

The accumulated effects of these various cost differences for each of the three locations are presented in Table 16.11. This analysis shows that the manufacturing cost of farm machinery in Winnipeg would be about 12 per cent below its level in Brantford. In contrast, manufacturing costs in Moline would be about 6 per cent higher than in Brantford. The table also shows the relative level of each component of total manufacturing cost for Winnipeg and Moline with Brantford taken as 100.

TABLE 16.11—COMPARATIVE MANUFACTURING COST ADVANTAGE OF FARM MACHINERY MANUFACTURING PLANTS IN BRANTFORD, WINNIPEG, AND MOLINE, 1966 WAGE AND SALARY RATES

Cost Factor	Brantford	Adjusting Factor	Winnipeg	Adjusting Factor	Moline
	(Base)	Brantford/ Winnipeg	Relative Cost	Brantford/ Moline	Relative Cost
<b>Materials</b>					
Purchased items	52.02		52.02		52.02
Inbound transportation	.98		2.16	....	.44
Materials	<u>53.00</u>		<u>54.18</u>		<u>52.46</u>
<b>Direct Labour</b>					
Wage costs	12.11	69	8.36	114	13.81
Fringe benefits	3.92	22	.86	108	4.23
Direct labour	<u>16.03</u>		<u>9.22</u>		<u>18.04</u>
÷ Productivity factor	1.00		.96		1.08
Adjusted direct labour	<u>16.03</u>		<u>9.60</u>		<u>16.70</u>
<b>Overheads</b>					
Indirect labour					
(incl. fringes)	7.52	62	4.66	128	9.63
Salaries					
(incl. fringes)	6.88	67	4.61	136	9.36
Maintenance	3.11	100	2.33	100	3.69
Depreciation	2.28	98	2.26	95	2.25
Warehousing					
and freight	1.82	90	1.64	95	1.73
Production tooling	1.49	100	1.49	100	1.49
Obsolescence and					
warranty	1.49	100	1.49	100	1.49
Administration	1.36	90	1.22	99	1.35
Power, light,					
heat, etc.	1.09	88	.96	149	1.63
Operating supplies	1.08	100	1.08	100	1.08
Property taxes	.84	100	.84	100	.84
Expense tools	.70	100	.70	100	.70
Defective work					
and scrap	.63	100	.63	100	.63
Insurance	.06	100	.06	100	.06
Other	.62	100	.62	100	.62
Total overheads	<u>30.97</u>		<u>24.59</u>		<u>36.55</u>
Total manufacturing costs	<u>100.00</u>		<u>88.37</u>		<u>105.71</u>

Source: N.B. MacDonald, *Locational Advantages in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 6 (Ottawa: Queen's Printer, 1970), Tables 3.3 and 3.7.

### Post-Production Differentials

Products of the farm machinery industry are usually sold or transferred to distributors or the firm's distribution division at about 61 per cent of the suggested retail list price. This provides a margin of some 7 per cent to cover the return on capital invested at the manufacturing level and other corporate expenses such as research and development. Of this total, about 3 per cent (of retail list) represents net manufacturing profit and interest on invested capital. In addition, outbound transportation costs are required before the machinery reaches its destination. The location decision may be affected by each of these costs.

*Outbound Transportation Costs* – The cost of shipping machinery to the dealer is normally added to the price to the dealer, and thus becomes part of the final price to the farmer. Thus the amount of these charges will vary from one location to another. Since, for the most part, farm machinery is sold f.o.b. factory, each manufacturer will have to consider his locational advantages or disadvantages relative to his competitors in setting his prices. This is particularly true where major competitors are some distance apart.

Some data on outbound transportation costs for farm machinery were prepared for the Commission and appear in Table 16.12. These data show the relative costs of shipping four major types of machines from each of the three locations under study. The estimates assume that the products would be sold throughout the North American market in proportion to the total sales in each region. These data show that Moline has a very significant advantage over both Winnipeg and Brantford in respect to outbound transport costs. Relative to Brantford, Moline's advantage varies from 38 per cent on self-propelled combines to 28 per cent on disk harrows. Winnipeg would have higher transport costs than Brantford for tractors and disk harrows but lower costs for combines and balers. For a plant producing combines, these transport costs would amount to 1.08 per cent of suggested retail price at Moline, 1.52 per cent at Winnipeg, and 1.75 per cent at Brantford.

TABLE 16.12—COMPARATIVE OUTBOUND FREIGHT COSTS FOR SPECIFIED PRODUCTS, BRANTFORD, WINNIPEG, AND MOLINE

Farm Machine Type	Weighted Average Shipping Costs to Supply North American Market from:					
	Brantford		Winnipeg		Moline	
	\$ Can.	Relative	\$ Can.	Relative	\$ Can.	Relative
Wheeled tractor	100	100	116	116	69	69
Self-propelled combine	179	100	156	87	110	62
Automatic baler	44	100	41	93	29	66
Tandem wheel-type disk harrow	36	100	40	111	26	72

Source: N.B. MacDonald, *Locational Advantages in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 6 (Ottawa: Queen's Printer, 1970), Table 4.1, taken from Appendix D, prepared for Royal Commission on Farm Machinery by Kates, Peat, Marwick & Co.

On the other hand, if it is assumed that a plant in Winnipeg limits itself to products that sell in the plains area of Canada and the United States, Winnipeg's disadvantage relative to Moline disappears. Table 16.13 gives a comparison of the cost of shipping a combine to various points on the Prairies. For this market Winnipeg's outbound transport costs would be some 42 per cent lower than those of a plant in Brantford, and Moline's 39 per cent lower.

TABLE 16.13—COMPARATIVE OUTBOUND FREIGHT COSTS FOR SELF-PROPELLED COMBINES TO WESTERN CANADIAN AND U.S. MARKETS, BRANTFORD, WINNIPEG, AND MOLINE

Canadian Provinces or U.S. Geographical Area and (Analyzed) Destination Points (in Parentheses)	Share of North American Market in Province or Area	Relative Cost if Shipped from:					
		Brantford		Winnipeg		Moline	
		Rail Rate	Rate x Market Share	Rail Rate	Rate x Market Share	Rail Rate	Rate x Market Share
		\$		\$		\$	
Manitoba (Winnipeg)	2.8	2.49	6.97	.53 <sup>1</sup>	1.48	1.58	4.42
Saskatchewan (Regina)	8.0	3.14	25.12	.57	4.56	2.17	17.36
Alberta (Edmonton)	5.0	3.90	19.50	1.14	5.70	3.07	15.35
U.S. Plains States (Omaha, Nebraska)	28.2	1.69	47.66	1.62	45.68	0.84	23.69
	44.0		99.25		57.42		60.82
Relative to Brantford as 100			100		58		61

<sup>1</sup> Highway transport to Brandon assumed for Manitoba.

Source: N.B. MacDonald, *Locational Advantages in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 6 (Ottawa: Queen's Printer, 1970), Table 4.3, p. 51.

While outbound transport costs are large enough to have a significant effect on a company's location decision, for major products they apparently do not alter seriously the relative prices of different companies' products. This is shown by the data in Table 16.14 which compares the f.o.b. factory and delivered prices of comparable combines for three different market areas when shipped from each of the three locations under study. For ease of comparison delivered prices of each combine at each point are expressed as a ratio to John Deere's delivered price taken as 100. It is clear that the difference added to the price by transport charges is small relative to the price difference that already exists on what are more or less comparable models of combines.

*Corporate Income Tax and Other Capital Costs* — Locational decisions may also be affected by the level of corporate income tax rates in different countries or areas. Analysis of federal and state or provincial taxes in Canada and the United States suggest that a firm of moderate size—one with total profits well over \$1 million—would currently pay tax rates of 52.1 per cent in Moline, 51.4 per cent in Brantford, and 50.9 per cent in Winnipeg. These rates do not take account of any

special tax concessions that might be obtained under area-development schemes, research programs or other special arrangements, and do not include the investment credit until recently in effect in the United States.

TABLE 16.14—EFFECTS OF TRANSPORT COSTS ON DELIVERED PRICE OF COMBINES FROM BRANTFORD, WINNIPEG, AND MOLINE TO SELECTED DELIVERY POINTS, 1968

Location of Factory	Suggested Retail Price f.o.b. Factory	Suggested Retail Price at Delivery Points		
		Des Moines, Iowa	Brandon	Edmonton
<u>Brantford</u>				
Cockshutt 542	\$ 9,953	\$10,200	\$10,269	\$10,402
Delivery charges		247	316	449
Relative number <sup>1</sup>	80.5	82.0	81.2	81.4
Massey-Ferguson 410	11,407	11,617	11,744	11,886
Delivery charges		210	337	479
Relative number <sup>1</sup>	92.3	93.4	92.9	93.1
<u>Winnipeg</u>				
Versatile 420	8,900	9,162	9,047	9,138
Delivery charges		262	147	238
Relative number <sup>1</sup>	72.0	73.7	71.6	71.5
<u>Moline</u>				
John Deere 95	12,357	12,433	12,643	12,773
Delivery charges		77	286	416
Relative number <sup>1</sup>	100	100	100	100
<u>International</u>				
Harvester 403	11,596	11,685	11,852	11,953
Delivery charges		89	256	357
Relative number <sup>1</sup>	93.8	94.0	93.7	93.6

Note: Prices at delivery points include delivery charges. The price relatives show the price at each point taken relative to John Deere's price as 100.

<sup>1</sup> Relative to John Deere's prices at destination shown as 100.

Source: N.B. MacDonald, *Locational Advantages in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 6 (Ottawa: Queen's Printer, 1970), Table E.3, p. 200.

For major firms, the cost of borrowed funds is not likely to differ significantly whether they are locating a plant in Canada or the United States. Many of these firms have in the past raised capital in the United States and subsequently used it in many different countries. While the U.S. balance-of-payments guidelines restrict this type of financing at the moment, it is believed that these restrictions will be temporary. Smaller firms would probably pay more for borrowed funds in Canada than in the United States, but no account has been taken of this in the present analysis.

## Summary and Conclusions

The over-all impact of manufacturing costs, outbound transportation charges, and corporate tax rates, is summarized in Table 16.15. These data show that for a combine selling at identical delivered prices and shipped to the entire North American market, the manufacturing profit before tax and after deducting outbound transportation charges would amount to 3.33 per cent of the suggested retail price in Brantford, 9.83 per cent in Winnipeg, and 0.91 per cent in Moline. Thus, in terms of profitability, this analysis would give a very considerable locational advantage to Winnipeg, as compared with either Brantford or Moline. The difference between Brantford and Moline, while less, is still comparatively large.

TABLE 16.15—COMPARATIVE COSTS, INCLUDING OUTBOUND TRANSPORTATION COSTS AND PROFITS FOR COMBINE PLANTS IN BRANTFORD, WINNIPEG, AND MOLINE

	Base Price Costs and Profit Data	Adjustments to Actual Locations		
		Brantford	Winnipeg	Moline
Suggested retail price	100.0	100.00	100.00	100.00
Actual price paid by farmers	85.0	85.00	85.00	85.00
Add lowest weighted average transportation cost <sup>1</sup> (from Moline)	—	1.08	1.08	1.08
Price paid by farmer, delivered	—	86.08	86.08	86.08
Actual transportation cost <sup>2</sup> to company	—	(1.75)	(1.53)	(1.08)
Transportation cost penalty	—	(0.67)	(0.45)	—
Transfer price received by manufacturing division from distri- bution division	61.0	60.33 <sup>3</sup>	60.55 <sup>3</sup>	61.00 <sup>3</sup>
Corporate costs charged to manufacturing, including R&D	(3.0)	(3.00)	(3.00)	(3.00)
Manufacturing costs	(54.0)	(54.00) <sup>4</sup>	(47.72) <sup>5</sup>	(57.09) <sup>6</sup>
Manufacturing profit before taxes	4.0	3.33	9.83	0.91

<sup>1</sup> Estimated as \$110, the weighted average transportation costs from Moline, to total North American market on wholesale price of \$7,314 or a factor cost of 1.08 in relation to suggested retail price of 100 (\$10,158).

<sup>2</sup> Moline as lowest weighted average transportation costs is then adjusted according to Table 16.12, Brantford 100 (\$10,158).

<sup>3</sup> 61.0 level transfer price minus outbound transportation penalty.

<sup>4</sup> Taken as "base".

<sup>5</sup> Adjusted to 88.37 per cent of base (Table 16.11).

<sup>6</sup> Adjusted to 105.71 per cent of base (Table 16.11).

Source: N.B. MacDonald, *Locational Advantages in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 6 (Ottawa: Queen's Printer, 1970), Table 4.4, p. 53.

It must be emphasized that, with any major shift of the industry towards Winnipeg, union pressure could reduce the relative labour cost advantage that this region now possesses. On the other hand, it was assumed that Winnipeg would purchase its materials and components from the same sources as Brantford and Moline. It is quite possible that even now Winnipeg might be able to substitute components made by local suppliers with some cost advantage over those shown in the study. Moreover, as the farm machinery industry developed in the Winnipeg area, a general growth of the parts-supply industry in this region could be expected. Further, it must be noted that for products sold primarily in the Prairie region of Canada and the United States, the advantage to Winnipeg is even larger.

Ontario has experienced a considerable decline in its share of both the Canadian and the combined Canada-U.S. production of farm machinery. In some measure this has been due to the declining importance of markets outside North America for Canadian firms. In very considerable degree this reflects the great expansion that has occurred in Massey-Ferguson's production facilities in Western Europe and other countries. Markets which this company formerly supplied from its Canadian factories now are supplied locally or from plants in nearby countries. It also reflects the general westward shift of the centre of the market in North America.

Is this downward trend in Ontario's share of North America's production of farm machinery likely to continue? In part this will depend on how the issue of wage parity is resolved. During the last round of wage negotiations carried on between the United Auto Workers and Massey-Ferguson the union was pressing for wage parity with their counterpart workers in the United States, with parity defined as the same wage in Canadian dollars as is paid in the United States in U.S. funds. An estimate of the effects that wage parity defined in this way would have on the competitive position of a farm machinery plant located in Brantford as compared to Moline is given in Table 16.16. As these data show, wage parity for all classes of workers in a Brantford plant would eliminate almost all of the advantage in manufacturing costs that such a plant now possesses as compared with a Moline plant. The Brantford plant would be left with no manufacturing-cost advantage to enable it to offset the outbound transportation cost disadvantage it has throughout much of the North American market. Thus these data support the argument advanced by Massey-Ferguson that wage parity would adversely affect the competitive position of Southern Ontario as a location for farm machinery production. On the other hand, Winnipeg's competitive position would be improved. This conclusion is, of course, dependent on the many assumptions that had to be made in developing this analysis. If a move to wage parity were accompanied, for example, by a move to parity in productivity, Moline's costs would still be about 2 per cent higher than Brantford's.

It should also be noted that if workers in Southern Ontario obtained parity with U.S. workers while wages in the Winnipeg area remained at their present level,



TABLE 16.16—COMPARABLE PRODUCTION COSTS OF BRANTFORD  
FARM MACHINERY PLANT BEFORE AND AFTER  
WAGE PARITY WITH MOLINE PLANT

Production Costs	Brantford		Moline	Differential	
	Before Parity Cost Adjustments (Table 16.11)	After Parity Cost Adjustments	(No Change from Table 16.11)	Brantford Costs Better/(Worse) than Moline	
				Before Parity	After Parity
<b>Material</b>	<u>53.00</u>	<u>53.00</u>	<u>52.46</u>	<u>(.54)</u>	<u>(.54)</u>
<b>Direct Labour</b>					
Wage costs	12.11	12.77 <sup>1</sup>	13.81	1.70	1.04
Fringe benefits	<u>3.92</u>	<u>4.14</u> <sup>2</sup>	<u>4.23</u>	<u>0.31</u>	<u>0.09</u>
Total labour	16.03	16.91	18.04	2.01	1.13
÷ Productivity factor	<u>1.00</u>	<u>1.00</u> <sup>3</sup>	<u>1.08</u>	<u>(1.34)</u> <sup>5</sup>	<u>(1.32)</u> <sup>5</sup>
Adjusted total	<u>16.03</u>	<u>16.91</u>	<u>16.70</u>	<u>0.67</u>	<u>(.21)</u>
<b>Overheads</b>					
Salaries (incl. fringes)	6.88	8.81 <sup>4</sup>	9.36	2.48	0.55
Indirect labour (incl. fringes)	7.52	9.02 <sup>4</sup>	9.63	2.11	0.61
Other	<u>16.57</u>	<u>16.57</u>	<u>17.56</u>	<u>0.99</u>	<u>0.99</u>
Total overheads	<u>30.97</u>	<u>34.40</u>	<u>36.55</u>	<u>5.58</u>	<u>2.15</u>
Total production costs	<u>100.00</u>	<u>104.31</u>	<u>105.71</u>	<u>5.71</u>	<u>1.40</u>
Taking Brantford costs after parity as 100		<u>100.00</u>	<u>101.34</u>		<u>1.34</u>

<sup>1</sup> At .925 of U.S. rate, equalling M-F definition of parity (the then official exchange rate).

<sup>2</sup> Fringe benefit costs increased proportionally to wage rate increase.

<sup>3</sup> Assumed lower productivity than in the United States was retained. If the move to parity had been accompanied by parity in productivity, Canadian direct labour cost would actually have gone down to 15.65 ( $16.91 \div 1.08$ ). Total costs after parity would then show as 103.05, leaving Moline's costs as 102.30 of Brantford's as 100.00.

<sup>4</sup> Table D.3A data adjusted to

	Ontario		Moline
	1966	(Parity)	
Indirect labour wage rate	\$2.70	\$3.24 ( $\$3.50 \times .925$ )	\$3.50
Fringe benefit (increased proportionally with wage increase)	<u>0.87</u>	<u>1.05</u>	<u>1.07</u>
Total	<u>\$3.57</u>	<u>\$4.29</u>	<u>\$4.57</u>
	100.00	120.16 (120)	128.01 (128)
Salaried employees salary	\$81.06	\$103.57 ( $\$111.97 \times .925$ )	\$111.97
Fringe benefit (increased proportionally with salary increase)	<u>26.26</u>	<u>33.56</u>	<u>34.15</u>
Total	<u>\$107.32</u>	<u>\$137.13</u>	<u>\$146.12</u>
	100.00	127.78 (128)	136.15 (136)

<sup>5</sup> Derived number, difference between differential for "total labour" and "adjusted total".

Source: N.B. MacDonald, *Locational Advantages in the Farm Machinery Industry*, Royal Commission on Farm Machinery, Study No. 6 (Ottawa: Queen's Printer, 1970), Table 5.3, p. 82.

the cost advantage that Winnipeg now has as compared with Brantford would widen further. Manufacturing costs in Winnipeg would be about 15.5 per cent below their level in Brantford instead of about 12 per cent. The relevant data are as follows:

Total Manufacturing Costs with Brantford Costs Before  
Parity Taken as 100

	Before Parity with 1968 Salary and Wage Rates	After Parity for Southern Ontario
Winnipeg	88.12	88.12
Brantford	100.00	104.31
Moline	105.42	105.42

This weakening of Southern Ontario's competitive position might well produce a further shift of manufacturing production out of Ontario and into Manitoba and the Prairies generally. This would be especially important for products such as swathers, diskers and chisel plows, which are mainly used on the Prairies.

#### Tractor Production in Canada

Canada's farm machinery industry is much smaller than it would otherwise be if she had a substantial tractor manufacturing industry. Currently, Canadian production is limited to a small crawler which International Harvester assembles at Hamilton and the large four-wheel-drive tractors that Versatile is producing in Winnipeg. In addition, Massey-Ferguson produces a substantial volume of tractor parts in Brantford and Toronto which are shipped for assembly to the firm's Detroit factory. What are the prospects for increased tractor production in Canada?

This question was analyzed by Massey-Ferguson for their own operations in their submission to the Commission.<sup>5</sup> The company estimated the cost differential that would arise if its Detroit tractor assembly plant and the ancillary transmission and axle plants were moved from Detroit to Brantford. The results of this analysis are shown in Table 16.17. This estimate, which was prepared for Massey-Ferguson by a private consulting firm, shows that the annual cost of operating these plants in Brantford would be about \$900,000 higher than in Detroit. Direct operating costs for labour, materials and utilities would be some \$2.8 million lower in Brantford. But this would be offset by an additional cost of \$2.3 million for inbound and outbound transportation, \$1.1 million for relocation and depreciation, and \$400,000 for additional duty on exports of industrial tractors.

The occupancy costs—depreciation and relocation—are cost differences that would face Massey-Ferguson if it were considering moving their Detroit facility. However, this is not a cost difference that would face a firm that might be considering locating a new facility in Detroit or Brantford. If these items of cost

<sup>5</sup> Massey-Ferguson Industries Limited, *Brief to the Royal Commission on Farm Machinery*, Ottawa, January 1968. Vol. I, Ch. IV, p. 28.

TABLE 16.17—DIFFERENCES BETWEEN ESTIMATED COST AT BRANTFORD AND ACTUAL COST AT DETROIT OF OPERATING TRACTOR ASSEMBLY, AND TRANSMISSION AND AXLE PLANTS  
(NOV. 1, 1964 TO OCT. 31, 1965)

(Millions of Canadian dollars)

<u>Costs</u>	<u>Cost Difference Assuming 1965 Brantford Costs</u>	
<u>Direct Operating Costs</u>		
Materials	-0.9	
Labour, hourly and salaried	-1.8	
Utilities	-0.1	
Total direct operating costs		-2.8
<u>Duty on Goods Produced</u>	+0.4	
<u>Transportation Costs</u>		
Inbound materials	+1.7	
Outbound finished products	+0.6	
Total, duty and transportation		+2.7
<u>Other Costs Associated with Relocation</u>		
Relocation	0.7	
Depreciation	0.4	
Total, other costs		+1.1
Total, all cost differences		1.0

Source: Taken from Massey-Ferguson Industries Ltd., *Brief to the Royal Commission on Farm Machinery*, Ottawa, January 1968, Vol. I, Ch. IV, p. 28.

were removed, annual costs at Brantford would be about \$200,000 lower than in Detroit. A further unfavourable cost differential for Brantford, the \$400,000 for duty, arises because industrial tractors are subject to duty by the United States but are duty-free coming into Canada. The existence of this duty clearly biases the tractor-location decision in favour of the United States. If it were possible through tariff negotiation to remove this duty, the Brantford location would have an over-all advantage of \$600,000. Commission staff analyzed the consultant's study which formed the basis of Massey-Ferguson's data, and concluded that the inbound transportation disadvantage shown for Brantford was overstated by about \$1 million.<sup>6</sup> When these three adjustments are added together, Brantford shows a cost advantage of \$1.6 million.

Thus, for a new tractor plant which had duty-free access to the U.S. market and with the wage differences in effect in 1966, this analysis suggests that Brantford would have a small advantage over Detroit. While the value of output from the Massey-Ferguson Detroit plant is not known, a rough estimate of its output would be \$120 million (39,000 tractors at just over \$3,000 each). On this basis the cost advantage would be around 1.3 per cent. It would be a larger percentage, perhaps as much as 3 to 4 per cent, of the value added in the plant.

<sup>6</sup>See N.B. MacDonald, *op. cit.*

Despite this small potential advantage for a Southern Ontario location there is little prospect at the moment that a new tractor factory will be located in this area. The prospect would be improved if the Canadian Government could negotiate a removal of the U.S. tariff on industrial tractors. However, even then, the prospect for a new tractor plant would not be good. In terms of number of units, tractor production in North America has been falling. In 1966, for example, the number of tractors produced was only half that of 1952, although the total horsepower capacity of those tractors may well have been larger. In a declining market, with existing firms developing excess capacity, there is little incentive to establish a new plant. Most of the new tractor-production facilities built during the past few years have been located in Western Europe, where costs of production are lower, or in developing countries where tariff or other protection has provided an inducement for their construction.

There is one additional disadvantage faced by a Canadian producer. A Canadian manufacturer of tractors and other farm machinery can buy machinery and equipment on a duty-free basis, but only if it is used entirely for the manufacture of farm machinery. But it may often be economical to combine the production of farm machinery with other products. In the United States, for example, International Harvester produces farm machinery jointly with other equipment, or produces components for both in almost half of all its plants. A Canadian manufacturer cannot obtain the economic advantages that may accrue from these joint production arrangements without forgoing his right to import production machinery and equipment without payment of duty. He is forced to choose between duty-free access to production machinery and the cost advantage of joint production.

The analysis in this chapter has shown that in recent years farm machinery production in Ontario has declined relative to Canada as a whole and to the Canada-United States total. At the same time output in Western Canada, in Quebec, and in the Maritimes has increased. Will these trends continue? Analysis of the relative locational advantages of Winnipeg, Brantford, and Moline suggests that Winnipeg currently enjoys a considerable advantage over the other two areas. At current wages and exchange rates (1969) Brantford has a slight advantage over Moline but most of this is needed to absorb the outbound transportation penalty it must face. Any further move towards wage parity would seriously weaken its competitive position.

In the short run, of course, the industry continues to produce in its existing facilities even though the economic advantages of that location has changed. And when—as is true of farm machinery—the industry's total output has grown very slowly (total output in 1966 was only slightly higher than the earlier peak reached in 1949), few new plants are built and the scope for changing the industry's location is more limited. When Massey-Ferguson was asked why it produced its swathers and diskers in Toronto, even though both these machines are used almost entirely on the Prairies, the company replied that it was able to build these in its existing

facilities in Toronto in what would otherwise be idle capacity. Still, it would appear that there is room for a very substantial further growth in production on the Prairies, since its current output is still small relative to the North American total—a little over 1 per cent. The very recent growth of output in the Maritimes reflects the efforts of one enterprise that specializes in potato equipment. There are undoubtedly opportunities in all parts of Canada for specialization in equipment related to particular regional specialties. Something further will be said on this matter in the chapter on research and development.