THE UNIVERSITY OF MANITOBA

# THE CONCEPT OF EFFECTIVE SUBSIDY AND ITS APPLICATION TO THE FLOUR MILLING INDUSTRY

by

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A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF SCIENCE

DEPARTMENT OF AGRICULTURAL ECONOMICS

WINNIPEG, MANITOBA

May, 1973

ACKNOWLEDGEMENTS

I should like to express my gratitude to Professor Larry R. Rigaux under whose supervision this study was conducted. He not only suggested the general topic area but also contributed much to the analytical development of this study. In addition, his encouragement throughout my master's program is greatly appreciated.

I am also indebted to Professor Norman J. Beaton and Professor Sol Sinclair for their helpful suggestions.

Thanks are also due to Mr. C. B. Davidson of the M. W. Menzies Group for giving me valuable information on the Canadian Flour Milling Industry.

I would also like to thank Mrs. Betty Sheppard for her help in typing the reading draft and the final copy of this thesis.

Financial assistance was provided by the Manitoba Department of Agriculture through the Department of Agricultural Economics at the University of Manitoba.

ABSTRACT

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The export subsidy has been a perennial bone of contention to competing exporters of various commodities in international trade. This is particularly true in agricultural trade. A typical example is the world trade in flour. Export subsidies on flour exports by large competitors are generally thought to be one of the main causes of the decline in the Canadian share of the world flour market. Previous studies have been confined to an analysis of nominal subsidy rates on flour; quantifications are needed to estimate the effectiveness of the subsidies in fuller terms. Therefore, it is desirable to develop an appropriate concept for treating export subsidies explicitly. The present study attempts to develop a model to estimate the effectiveness of export subsidies net of input distortions so as to arrive at "the effective rate of subsidy".

The working formula for calculating the effective rate of subsidy for the industry j is:

$$g_j = \frac{S_j - \sum_{i=1}^{n} A_{ij}\left[\frac{P_{dij}}{P_{wij}} - 1\right]}{1 - \sum_{i=1}^{n} A_{ij}}$$

Where: $g_j$ = effective rate of subsidy for industry j;

$S_j$ = nominal rate of export subsidy for industry j;

$A_{ij}$ = the production coefficient or input-output coefficient for the $i^{th}$ intermediate input in the industry j. (Proportion of unit sales value of output j represented by intermediate input i);

$P_{dij}$ = domestic price of the $i^{th}$ input in the industry j; and

$P_{wij}$ = world price of the $i^{th}$ input in the industry j.

The model so developed is applied to the U.S., Canada and the E.E.C. exports of flour. The results show that Canada had negative effective rates of subsidy throughout the year 1960/61 to 1969/70 while the U.S. rates remained positive during this entire period. The E.E.C. also has positive effective rates of subsidy in all the three years where data are available. These estimations provide quantification of the disadvantage caused for Canadian flour exports by export subsidies on flour by large competitors.

It is shown, by using simple least squares linear regression, that there is strong correlation between the effective rates of subsidy and the exports of U.S. flour. No significant correlation is found between the effective rates of subsidy and the exports of flour by using the Canadian data. However, this can be explained by Canada's increasingly residual status as a foreign market supplier of flour in the face of aggressively subsidized competition. It is concluded that the concept of effective subsidy can be of use in designing domestic policy measures and in bargaining in international trade negotiations.

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# CHAPTER 1

# INTRODUCTION

## A. Background and Problem

Wheat is the most traded commodity in Canadian agricultural trade. The revenue from wheat sales and the various types of service activities involved in its production and marketing makes a substantial contribution to the economy of Canada. Wheat is exported either in its raw form or in the semi-processed form, i.e. flour. In the past decade, with the exception of 1969, the annual value of the exports of wheat and wheat flour have consistently constituted more than 50 percent of the total value of the Canadian agricultural exports. Therefore, the export performance of wheat and wheat flour has significant influence on the agricultural sector and the foreign exchange of the Canadian economy.

The Canadian Flour Milling Industry (CFMI) has consistently been one of the largest single consumers of Canadian wheat. During the 15 year period from 1956/57 to 1970/71, the consumption of Canadian wheat by the CFMI was only surpassed by the exports of wheat to the U.S.S.R. in 1963/64, 1965/66 and 1966/67; and the exports of wheat to the People's Republic of China in 1970/71. From 1965/66 to 1970/71 crop years, an average of 15.5 percent of wheat production was milled annually for both domestic consumption and exports.

The exports of flour have been an important part of total wheat trade. With the normal extraction rate of .72, for every 100

pounds of flour produced, about 138 pounds of wheat are required.[1] Therefore, any increase in the export of flour will imply an increase of 138 percent of the same amount in wheat sales.

Unfortunately in the past two decades, the CFMI has experienced difficulties in competing in the world flour markets. The share of the world flour markets held by the CFMI has dropped from 33.7 percent of 4,422 thousand metric tons[2] in 1950/51 to 12.3 percent of 5,559 thousand metric tons in 1970/71. This indicates that the position of the CFMI in the world flour markets has declined in both absolute and relative terms. Therefore, resource employment and returns in the CFMI have been lower than may have otherwise been. Furthermore, total sales of wheat may have been restrained below potential because a significant outlet for the processed form was diminished. Therefore, investigation of the causes and remedies for the decline of the CFMI is desirable not only for the CFMI itself, but also for the Canadian wheat economy in general.

S. C. Hudson has given several reasons for the decline of Canada's exports of flour.[3] Growing subsidization of flour exports by other major exporting countries is generally regarded as one of the

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[1]The extraction rates in Canada, U.S. and E.E.C. were about the same in the past 5 years.

[2]All units of flour are in wheat equivalent except where otherwise stated.

[3]S. C. Hudson, Future Market Outlets for Canadian Wheat and Other Grains, (Ottawa: Economic Council of Canada, 1970).

main causes for Canada's declining share of the world flour trade. However, the actual effectiveness of export subsidies has not been the subject of specific investigation and little systematic analysis has been done on this problem in relation to the case of flour. In Chapter 4 of this study, this problem is treated explicitly.

B. Objectives of this Study

The present study is primarily directed towards an enquiry of the effectiveness of competitors' export subsidies on the levels of flour exports by the CFMI. The ultimate purpose is to interpret this information in relation to various policy measures that might be adopted to assist the industry. In order to reach this basic objective, it is necessary to formulate and work towards several specific objectives. These are:

1. To review trends and patterns in the world trade in flour over the past 20 years.
2. To examine the problems and dimensions of the CFMI.
3. To develop a model for evaluating the effectiveness of subsidies on exports.

In order to facilitate the analysis, it is necessary to develop and achieve two subsidiary objectives. Firstly, the effect of subsidies on competitors' flour exports will have to be analyzed. Secondly, it will be necessary to identify other distortions than subsidies that have a potential effect into the analysis.

C. Scope of this Study

The present study begins by reviewing the trend of world trade in flour in the past twenty years. Then, the performance of the CFMI in the world flour markets in the last two decades is examined so that the problems encountered by the CFMI can be delineated. Alternatives for solving the problems revealed by the trend observations are, then, evaluated. However, the main emphasis of the study is on the tackling of the problem of export subsidy. The concept of effective subsidy is, therefore, developed. The concept facilitates the exposition of the merits of various policy measures in assisting the CFMI.

World trade in flour in the past two decades is reviewed in Chapter 2. This provides a picture of the trend and the importance of the various markets in world flour trade.

The dimensions and problems of the CFMI are investigated in Chapter 3. The importance of the CFMI in the wheat economy is discussed, and the economic problems encountered by the CFMI are delineated.

Chapter 4 is devoted to the derivation of the concept of effective subsidy from the concept of effective protection which was originally advocated by Professor Clarence L. Barber.[4] The concept of effective protection stresses that the nominal tariff rates do not represent the true protection on the domestic industry because of the

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[4] C. L. Barber, "Canadian Tariff Policy", The Canadian Journal of Economics and Political Science, Vol. XXI, November, 1955. In particular, see pp. 523-524.

distortion resulting from the tariffs on the inputs. Similarly, the concept of effective subsidy contends that the nominal subsidy rates do not represent the true subsidy because of the various tariffs and/or non-tariff trade distortions which cause the input prices to vary.

In Chapter 5, results of calculations of the effective rates of subsidy on the U.S., Canadian and the E.E.C. exports of flour are reported. These results serve to reveal the magnitude of competitive pressure on the CFMI and to demonstrate the application of the concept of effective subsidy in general. In addition, the limitations of the model used in this study for calculating the effective rates of subsidy are also discussed in this chapter.

In Chapter 6, alternatives for alleviating the predicament of the CFMI are suggested and evaluated after the revelation of the trend and problems of the CFMI and the calculation of the effective subsidy rates on flour for Canada as well as her major competitors. Further application of the effective rate of subsidy is also discussed within the context of this chapter.

A summary and a tentative conclusion of this study are put in the last chapter.

# CHAPTER 2

## WORLD TRADE IN FLOUR

World trade in flour expanded almost steadily from the 1950/51 crop year to the 1963/64 crop year when it reached its all time high record of over seven million metric tons (Table 1). The growth of world flour trade was mainly a result of the very rapid increase of exports on special terms. For example, in 1954/55, only 1.7 percent of the U.S. flour exports was under government programmes, but in 1962/63, it rose to 77.5 percent and in 1970/71, it was 86.8 percent (Table 2). The all time high record of world trade in flour in 1963/64 was the result of 1,342 thousand metric tons of flour imported by the U.S.S.R. Since 1963/64, world exports of flour have leveled off at around 5,600 thousand metric tons.

Although world trade in flour has expanded from 4,422 thousand metric tons in 1950/51 to 5,559 thousand metric tons in 1970/71, the importance of flour trade relative to total world trade in wheat and flour has declined steadily. World trade in flour as a percentage of total world trade in wheat and flour has declined from 17.4 percent in 1950/51 to 10.4 percent in 1970/71 (Table 1). This implies that the expansion of world trade in flour in the last two decades was not as fast as that in wheat. In fact, world trade in flour has stagnated between 5,500 and 5,900 thousand metric tons since 1963/64 when it reached its all time high of 7,077 thousand metric tons; the increase in imports in Asia were offset by the decline in Europe. On the other hand world trade in wheat has increased from 21 million metric tons

TABLE 1

WORLD EXPORTS OF WHEAT AND WHEAT FLOUR, 1950/51 to 1970/71:

(IN 1,000 METRIC TONS WHEAT EQUIVALENT)

| YEAR | WHEAT | FLOUR | TOTAL | FLOUR AS A PERCENTAGE OF TOTAL |
|---|---|---|---|---|
| 1950/51[1] | 20,963 | 4,422 | 25,385 | 17.4 |
| 1951/52[1] | 24,482 | 4,509 | 28,991 | 15.6 |
| 1952/53[1] | 21,378 | 4,687 | 26,065 | 18.0 |
| 1953/54 | 20,138 | 4,192 | 24,330 | 17.2 |
| 1954/55 | 23,452 | 4,322 | 27,774 | 15.6 |
| 1955/56 | 24,573 | 4,635 | 29,208 | 15.9 |
| 1956/57 | 31,135 | 4,941 | 36,076 | 13.7 |
| 1957/58 | 26,699 | 5,718 | 32,417 | 17.6 |
| 1958/59 | 29,964 | 5,753 | 35,717 | 16.1 |
| 1959/60 | 30,889 | 5,864 | 36,753 | 15.9 |
| 1960/61 | 36,665 | 6,038 | 42,703 | 14.1 |
| 1961/62 | 40,498 | 6,967 | 47,465 | 14.7 |
| 1962/63 | 37,530 | 6,123 | 43,653 | 14.0 |
| 1963/64 | 49,316 | 7,077 | 56,393 | 12.5 |
| 1964/65 | 45,231 | 5,966 | 51,197 | 11.7 |
| 1965/66 | 56,891 | 5,596 | 62,487 | 9.0 |
| 1966/67 | 50,319 | 5,814 | 56,133 | 10.4 |
| 1967/68 | 47,130 | 4,953 | 52,083 | 9.5 |
| 1968/69 | 39,560 | 5,435 | 44,995 | 12.1 |
| 1969/70[2] | 44,380 | 5,877 | 50,257 | 11.7 |
| 1970/71[2] | 48,147 | 5,559 | 53,706 | 10.4 |

1. These figures are provisional because no final figures by destination are available for these years.

2. Provisional

Source:

International Wheat Council, Trade in Wheat Flour, Secretariat Paper No. 5, (London: Bradley and Son Ltd., 1965); World Wheat Statistics, (London, Bradley and Son Ltd., Annual).

TABLE 2

U.S. FLOUR EXPORTS UNDER GOVERNMENT PROGRAMMES AND COMMERCIAL SALES

Selected Years 1954/55 to 1970/71

(IN 1,000 METRIC TONS WHEAT EQUIVALENT)

| YEAR | PROGRAMMED | | COMMERCIAL | | TOTAL |
|---|---|---|---|---|---|
| | QUANTITY | AS A PERCENTAGE OF TOTAL | QUANTITY | AS A PERCENTAGE OF TOTAL | |
| 1954/55 | 22 | 1.7 | 1,270 | 98.3 | 1,292 |
| 1958/59 | 1,007 | 45.9 | 1,185 | 54.1 | 2,192 |
| 1962/63 | 2,156 | 77.5 | 625 | 22.5 | 2,781 |
| 1969/70 | 1,517[1] | 86.0 | 247[2] | 14.0 | 1,764 |
| 1970/71 | 1,225[1] | 86.8 | 183[2] | 13.2 | 1,408 |

1. Figures are obtained by multiplying the percentage of programmed exports from data in the Foreign Agricultural Trade of the U.S. with the total exports as in World Wheat Statistics, International Wheat Council.

2. Total exports in World Wheat Statistics less programmed exports.

Source:

International Wheat Council, Trade in Wheat Flour, Secretariat Paper No. 5. (London: Bradley and Son Ltd., 1965); World Wheat Statistics, (London: Bradley and Son Ltd., Annual). U.S.D.A., Foreign Agricultural Trade of the U.S., November, 1971

in 1950/51 to 48 million metric tons in 1970/71 (Table 1).

The decline in the relative importance of flour trade in the past two decades was the result of three main factors:

1. The very substantial imports of wheat grain by Mainland China and in some years by the U.S.S.R., and by less developed countries such as India, Brazil, and Pakistan.
2. The change from flour to wheat imports by many less developed countries in South America following the establishment of domestic milling industries.
3. The trend towards self-sufficiency in Europe which meant milling capacity was increased to meet domestic demand. Therefore, flour imports have declined in that area.

The expansion in the volume of flour trade was sustained partly due to a very rapid increase of government subsidy programmes on flour exports (Table 2), and partly due to the availability of competitive-priced supplies of flour which narrowed the margin between wheat and flour prices (Table 3).

The U.S. has operated a cash payment subsidy since 1949. This was necessitated by the domestic price support level for wheat which was above the prices in the world market. Since 1964, the U.S. wheat producers have also received, in addition, certificate payments on a certain portion of production. These certificates are required to be purchased by processors, including those producing flour for export. This results in the higher prices of the U.S. flour. Therefore subsidy programmes have been continued on flour. However, the quantities

TABLE 3

WHEAT & FLOUR EXPORT PRICES[1] OF SELECTED COUNTRIES

1951 to 1970 (U.S. $/M.T.)

| YEAR | AUSTRALIA | | CANADA | | U.S. | | E.E.C.[2] | |
|---|---|---|---|---|---|---|---|---|
| | WHEAT | FLOUR | WHEAT | FLOUR | WHEAT | FLOUR | WHEAT | FLOUR |
| 1951 | - | - | 64.96 | 100.75 | 77.17 | 104.97 | 88.80 | 137.21 |
| 1952 | - | - | 69.48 | 100.79 | 83.71 | 105.64 | 84.49 | 155.64 |
| 1953 | 73.14 | 105.39 | 73.15 | 104.88 | 78.94 | 105.62 | 89.77 | 139.31 |
| 1954 | 63.68 | 84.80 | 68.04 | 101.02 | 66.98 | 99.97 | 63.94 | 111.94 |
| 1955 | 58.87 | 73.76 | 66.33 | 98.65 | 64.11 | 95.83 | 62.38 | 165.56 |
| 1956 | 53.38 | 62.52 | 63.36 | 95.37 | 62.39 | 92.07 | 70.46 | 79.50 |
| 1957 | 56.07 | 74.26 | 62.75 | 94.24 | 64.93 | 93.97 | 57.29 | 73.82 |
| 1958 | 60.55 | 78.27 | 62.18 | 91.46 | 63.59 | 101.03 | 59.35 | 62.62 |
| 1959 | 56.31 | 67.33 | 64.28 | 90.07 | 63.21 | 92.42 | 60.62 | 63.63 |
| 1960 | 55.64 | 70.02 | 63.84 | 89.41 | 62.15 | 88.35 | 64.11 | 63.31 |
| 1961 | 55.10 | 71.47 | 65.36 | 88.03 | 65.16 | 92.34 | 60.85 | 65.96 |
| 1962 | 57.71 | 74.48 | 69.91 | 91.23 | 66.58 | 90.14 | 65.00 | 74.00 |
| 1963 | 58.74 | 74.13 | 67.97 | 92.23 | 65.69 | 91.12 | 61.13 | 70.10 |
| 1964 | 58.72 | 75.64 | 69.69 | 91.84 | 66.17 | 89.21 | 65.16 | 77.14 |
| 1965 | 58.25 | 80.85 | 65.62 | 99.34 | 60.09 | 87.15 | 66.19 | 74.86 |
| 1966 | 57.35 | 78.75 | 67.54 | 99.64 | 62.10 | 92.50 | 66.64 | 73.40 |
| 1967 | 62.19 | 80.10 | 72.11 | 100.93 | 64.11 | 91.03 | 75.14 | 76.05 |
| 1968 | 59.08 | 77.12 | 68.72 | 105.62 | 61.59 | 84.78 | 67.00 | 72.27 |
| 1969 | 59.16 | 77.37 | 70.70 | 105.79 | 60.06 | 87.60 | 71.57 | 73.64 |
| 1970 | 54.90 | 79.78 | 61.30 | 106.43 | 58.02 | 84.65 | 75.16 | 80.95 |

1. Prices are obtained from dividing total value by total quantity exported.
2. Aggregate of Belgium-Luxemberg, France, W. Germany, Italy & Netherlands. - not available

Source:

Food and Agriculture Organization, Trade Year Book (Rome: F.A.O., annual).
United Nations, Commodity Trade Statistics (New York, N.Y.: Publishing Service, United Nations, annual).

subsidized have declined since 1962/63 (Table 2) and the subsidy rate has also been reduced since the early 1960's. The export payments on flour have declined from an average of over 80¢ per bushel in the early sixties to less than 20¢ per bushel in the late sixties.[1]

In Canada until March 1, 1957 no subsidy or freight assistance was provided on flour exports. The introduction of the Export Flour Adjustment[2] on March 1, 1957 by the Canadian Wheat Board was to reduce the price of wheat intended for the production of flour for export to destinations other than the U.S., United Kingdom and Europe. The Flour Export Adjustment varied in amount depending on the port of shipment and was adjusted from time to time to meet export competition. In 1959, the Canadian Wheat Board gave millers an additional freight adjustment for wheat exported as flour, equal to the increase in Lakehead prices resulting from freight saving due to the opening of the St. Lawrence Seaway. The new price adjustments were made applicable to flour sales to the U.K. and Europe, and were incorporated in the existing Export Flour Adjustment rates. However, in January 1962, the original form of assistance was eliminated and only the price reduction corresponding to the lake freight adjustment was maintained. On June 22, 1964, the Flour Export Adjustment was suspended.

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[1] For more detail, see Table 12 in Chapter 5.

[2] It should be noted that the total cost of this assistance was borne by the wheat producers and there were no government subsidies.

In the countries of the European Economic Community (E.E.C.)[3] before the common cereal policy came into effect on July 30, 1962, there were wide differences in national policies affecting flour trade. In practice, only the Netherlands was an importer of flour of any significance. Others discouraged flour imports through a system of import licenses and in some cases also by high duties and levies. In F.R. Germany, there were no direct subsidies for exports of grains. But if imported wheat for which the levy had been paid was milled into flour and subsequently exported, then the German importer had the right to replace this wheat by importing a quantity of wheat free of levy. As the conversion factor for wheat to flour under these arrangements was high compared with the actual extraction rate, the German miller obtained an indirect subsidy. In Italy, the government subsidized flour exports as it had a monopoly control over wheat imports and over the prices of both imported and domestic wheat. In addition, it operated the "re-integro" system which was similar to the system in the F.R. Germany. In France, the main burden of the cost of subsidies was borne by the government through its monopoly agency, Office National Interprofessional Des Céréales (O.N.I.C.), but the system for calculating the returns to producers meant that the wheat growers also shared some of the cost. The method used by the O.N.I.C. to determine the subsidy

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[3]Belgium, France, F.R. Germany, Italy, Luxembourg and Netherlands.

level was by tender.[4]

Since July 30, 1962, a uniform system for grain support has been in operation in the E.E.C. countries. The basic grain regulation provides that a refund (restitution) to cover the difference between the world market prices and those in the exporting country may be given for exports of flour to third countries. The regulation also provides a supplementary refund to cover the cost of transportation to importing countries. The supplementary refund, however, may be varied according to the zone of destination[5] and may be revised during a marketing season in accordance with the market trend.

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[4]Information in the above three paragraphs is based on International Wheat Council, Trade in Wheat Flour, Secretariat Paper No. 5, (London: Bradley & Son Ltd., 1965).

[5]Currently there are eight different zones of destination.

Zone I - Libya, United Arab Republic, Israel, Jordan, Lebanon, Syria, Cyprus, Turkey.

Zone II - Mauritania, Senegal, Guinea, Ivory Coast, Dahomey, Togo, Mali, Upper Volta, Niger, Central African Republic, Congo (Brazzaville), Chad, Gabon, Cameroun, Congo (Kinshasa), Gambia, Sierra Leone, Ghana, Nigeria, South-West Africa.

Zone IIIA - Mexico and Central American Countries, including Greater & Lesser Antilles.

Zone IIIB - South America.

Zone IVA - Arabian Peninsula, Iraq, Afghanistan, Pakistan, India (Including Butan and Kashmir), Nepal, Ceylon, Burma, Islands of the Indian Ocean.

Zone IVB - Other countries and territories of Africa.

Zone IVC - Other countries and territories of Asia and Oceania.

OTHERS

The structure of world trade in flour has changed considerably during the past two decades. On the export side, the domination of the world flour market by the U.S. and Canada has dwindled while the E.E.C. has emerged as the largest exporter of flour. In 1950/51, the U.S., Canada, and Australia were the major exporters of flour, having 33.8 percent, 33.7 percent and 21.9 percent of the world market respectively. At that time, the E.E.C. had only a share of 5.5 percent of the world market for flour (Table 4). However, by 1970/71, the E.E.C. had increased its share of the world market for flour to 36.1 percent while the U.S., Canada and Australia constituted only 25.3 percent, 12.3 percent and 7.5 percent of the total world flour trade respectively (Table 4). The success of the E.E.C. to capture and greatly increase its share of the world flour market was the consequence of heavy subsidization which enabled a lower selling price of flour to be set (Table 3). In fact, the trend of increasing share of the world flour market by the E.E.C. countries began in the mid-50's (Table 4). Coinciding with this has been the drastic decline in the export prices of flour from these countries since 1956 (Table 3). Indeed, it has been alleged that "the E.E.C. sometimes subsidizes flour exports at an amount equal to, and at times exceeding, the full value of the flour".[6]

On the import side, Table 5 shows the trend of imports of

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[6]U.S.D.A., Foreign Agriculture, June 12, 1972. p. 6.

TABLE 4

FLOUR EXPORTS OF MAJOR FLOUR EXPORTING COUNTRIES
1950/51 to 1970/71
(IN 1,000 M.T. WHEAT EQUIVALENT)
(FIGURES IN BRACKETS ARE PERCENTAGES OF TOTAL)

| YEAR | AUSTRALIA | | CANADA | | E.E.C.[3] | |
|---|---|---|---|---|---|---|
| 1950/51[1] | 967 | (21.9) | 1,489 | (33.7) | 245 | ( 5.5) |
| 1951/52[1] | 1,022 | (22.7) | 1,414 | (31.4) | 325 | ( 7.2) |
| 1952/53[1] | 1,126 | (24.0) | 1,554 | (33.2) | 426 | ( 9.1) |
| 1953/54 | 959 | (22.9) | 1,295 | (30.9) | 462 | (11.0) |
| 1954/55 | 826 | (19.1) | 1,149 | (26.6) | 640 | (14.8) |
| 1955/56 | 840 | (18.1) | 1,016 | (21.9) | 1,101 | (23.8) |
| 1956/57 | 945 | (19.1) | 963 | (19.5) | 829 | (16.8) |
| 1957/58 | 606 | (10.6) | 1,078 | (18.9) | 1,542 | (27.0) |
| 1958/59 | 563 | ( 9.8) | 1,005 | (17.5) | 1,298 | (22.6) |
| 1959/60 | 681 | (11.6) | 996 | (17.0) | 1,403 | (23.9) |
| 1960/61 | 835 | (13.8) | 980 | (16.2) | 1,191 | (19.7) |
| 1961/62 | 736 | (10.6) | 865 | (12.4) | 1,710 | (24.5) |
| 1962/63 | 660 | (10.8) | 772 | (12.6) | 1,328 | (21.7) |
| 1963/64 | 901 | (12.7) | 1,489 | (21.0) | 1,658 | (23.4) |
| 1964/65 | 755 | (12.7) | 909 | (15.2) | 1,520 | (25.5) |
| 1965/66 | 525 | ( 9.4) | 990 | (17.7) | 1,652 | (29.5) |
| 1966/67 | 478 | ( 8.2) | 912 | (15.7) | 2,012 | (34.6) |
| 1967/68 | 513 | (10.4) | 634 | (12.8) | 1,341 | (27.1) |
| 1968/69 | 478 | ( 8.8) | 645 | (11.9) | 1,665 | (30.6) |
| 1969/70[2] | 450 | ( 7.7) | 772 | (13.1) | 1,742 | (29.6) |
| 1970/71[2] | 418 | ( 7.5) | 685 | (12.3) | 2,008 | (36.1) |

[1]Figures are provisional because no final figures by destinations are available for these years.

[2]Provisional

[3]Figures exclude E.E.C. Intra-trade. Figures from 1950/51 to 1962/63 include only France, F.R. Germany and Italy.

TABLE 4 (CONTINUED)

| YEAR | U.S. | | OTHERS | | TOTAL |
|---|---|---|---|---|---|
| 1950/51[1] | 1,495 | (33.8) | 226 | ( 5.1) | 4,422 |
| 1951/52[1] | 1,363 | (30.2) | 385 | ( 8.5) | 4,509 |
| 1952/53[1] | 1,357 | (28.9) | 224 | ( 4.8) | 4,687 |
| 1953/54 | 994 | (23.7) | 482 | (11.5) | 4,192 |
| 1954/55 | 1,292 | (29.9) | 415 | ( 9.6) | 4,322 |
| 1955/56 | 1,370 | (29.6) | 308 | ( 6.6) | 4,635 |
| 1956/57 | 1,999 | (40.5) | 205 | ( 4.1) | 4,941 |
| 1957/58 | 2,193 | (38.4) | 299 | ( 5.2) | 5,718 |
| 1958/59 | 2,192 | (38.1) | 695 | (12.1) | 5,753 |
| 1959/60 | 2,468 | (42.1) | 316 | ( 5.4) | 5,864 |
| 1960/61 | 2,713 | (44.9) | 319 | ( 5.3) | 6,038 |
| 1961/62 | 2,987 | (42.9) | 669 | ( 9.6) | 6,967 |
| 1962/63 | 2,781 | (45.4) | 582 | ( 9.5) | 6,123 |
| 1963/64 | 2,553 | (36.1) | 476 | ( 6.7) | 7,077 |
| 1964/65 | 2,186 | (36.6) | 596 | (10.0) | 5,966 |
| 1965/66 | 2,004 | (35.8) | 425 | ( 7.6) | 5,596 |
| 1966/67 | 1,851 | (31.8) | 561 | ( 9.6) | 5,814 |
| 1967/68 | 1,394 | (28.1) | 1,071 | (21.6) | 4,953 |
| 1968/69 | 1,648 | (30.3) | 999 | (18.4) | 5,435 |
| 1969/70[2] | 1,764 | (29.8) | 1,149 | (19.6) | 5,877 |
| 1970/71[2] | 1,408 | (25.3) | 1,040 | (18.7) | 5,559 |

Source:

International Wheat Council, World Wheat Statistics, (London: Bradley & Son Ltd., annual) and World Trade in Wheat Flour, Secretariat Paper No. 5, (London: Bradley & Son Ltd., 1965).

TABLE 5

IMPORTS OF FLOUR BY REGIONS, 1954/55 to 1970/71:

(IN 1,000 M.T. WHEAT EQUIVALENT)

(FIGURES IN BRACKETS ARE PERCENTAGES OF TOTAL)

| YEAR | EUROPE | U.S.S.R. | CENTRAL AMERICA | SOUTH AMERICA |
|---|---|---|---|---|
| 1954/55 | 804 (19.6) | - | 650 (15.9) | 550 (13.4) |
| 1955/56 | 1,040 (24.0) | - | 620 (14.3) | 524 (12.1) |
| 1956/57 | 750 (17.6) | - | 640 (15.1) | 400 ( 9.4) |
| 1957/58 | 880 (19.4) | - | 680 (15.0) | 530 (11.7) |
| 1958/59 | 1,210 (23.4) | - | 640 (12.4) | 290 ( 5.6) |
| 1959/60 | 1,222 (23.0) | - | 680 (12.8) | 210 ( 3.9) |
| 1960/61 | 1,074 (19.8) | - | 525 ( 9.7) | 240 ( 4.4) |
| 1961/62 | 1,295 (22.1) | - | 630 (10.7) | 250 ( 4.3) |
| 1962/63 | 785 (15.0) | - | 740 (14.0) | 268 ( 5.1) |
| 1963/64 | 882 (13.0) | 1,342 (19.8) | 765 (11.3) | 300 ( 4.4) |
| 1964/65 | 571 (10.3) | 252 ( 4.5) | 810 (14.6) | 280 ( 5.1) |
| 1965/66 | 520 (10.3) | 161 ( 3.2) | 712 (14.2) | 278 ( 5.5) |
| 1966/67 | 334 ( 5.7) | 371 ( 6.4) | 811 (13.9) | 355 ( 6.1) |
| 1967/68 | 202 ( 4.4) | - | 792 (17.4) | 275 ( 6.0) |
| 1968/69 | 212 ( 5.2) | - | 622 (15.3) | 170 ( 4.2) |
| 1969/70[1] | 201 ( 3.6) | - | 677 (11.9) | 277 ( 4.9) |
| 1970/71[1] | 154 ( 2.9) | - | 681 (12.6) | 282 ( 5.2) |

[1] Provisional

- Not significant or nil

TABLE 5 (CONTINUED)

| YEAR | ASIA | AFRICA | OCEANIA | TOTAL |
|---|---|---|---|---|
| 1954/55 | 1,476 (36.0) | 560 (13.7) | 58 ( 1.4) | 4,098 |
| 1955/56 | 1,590 (36.7) | 500 (11.5) | 60 ( 1.4) | 4,334 |
| 1956/57 | 1,810 (42.6) | 600 (14.1) | 50 ( 1.2) | 4,250 |
| 1957/58 | 1,635 (36.1) | 765 (16.9) | 40 ( 1.0) | 4,530 |
| 1958/59 | 1,780 (34.4) | 1,210 (23.4) | 50 ( 1.0) | 5,180 |
| 1959/60 | 1,970 (37.0) | 1,190 (22.4) | 50 ( 1.0) | 5,322 |
| 1960/61 | 2,360 (43.6) | 1,160 (21.4) | 60 ( 1.1) | 5,419 |
| 1961/62 | 2,190 (37.3) | 1,440 (24.6) | 60 ( 1.0) | 5,865 |
| 1962/63 | 1,895 (36.0) | 1,520 (29.2) | 60 ( 1.1) | 5,268 |
| 1963/64 | 1,745 (25.7) | 1,640 (24.2) | 110 ( 1.6) | 6,784 |
| 1964/65 | 1,841 (33.2) | 1,650 (29.8) | 140 ( 2.5) | 5,544 |
| 1965/66 | 1,536 (30.6) | 1,700 (33.8) | 120 ( 2.4) | 5,027 |
| 1966/67 | 1,830 (31.3) | 2,050 (35.1) | 90 ( 1.5) | 5,841 |
| 1967/68 | 1,441 (31.6) | 1,755 (38.5) | 90 ( 2.0) | 4,555 |
| 1968/69 | 1,653 (40.6) | 1,340 (32.9) | 70 ( 1.7) | 4,067 |
| 1969/70[1] | 2,790 (49.8) | 1,600 (28.6) | 65 ( 1.2) | 5,600 |
| 1970/71[1] | 2,821 (52.3) | 1,355 (25.1) | 96 ( 1.8) | 5,389 |

[1]Provisional

Source:

International Wheat Council, World Wheat Statistics, (London: Bradley & Son Ltd., 1965).

flour in different geographic regions. Asia, Africa and Oceania were the regions where growth in imports of flour occurred during the last two decades. From 1954/55 to 1970/71, imports of flour in Asia increased from 1,476 to 2,821 thousand metric tons. In the same period, Africa and Oceania increased from 560 to 1,355 thousand metric tons and from 58 to 96 thousand metric tons respectively. In Central America, imports of flour have remained rather stable at around 650 thousand metric tons in the past two decades. The major areas that show declining imports of flour are Europe and South America. Imports of flour in Europe declined from its all time high record of 1,295 thousand metric tons in 1961/62 to only 154 thousand metric tons in 1970/71. The U.S.S.R. has only imported significant amounts of flour from 1963/64 to 1966/67, and has had no substantial effect on the world flour trade since then.

Markets for flour have become more concentrated. Asia has become the most important market for flour trade. It constituted 52.3 percent of the total world imports of flour in 1970/71 (Table 5). Both Europe and South America which once constituted over 20 and 12 percent of the world flour imports respectively have lost their importance, representing only 2.9 and 5.2 percent of the world flour imports respectively in 1970/71 (Table 5).

The greater intensity of competition in the world flour trade which developed during the 1950's was reflected in the flour prices. The price of flour depends primarily on the price of wheat which ranged from 70 to 80 percent of the total cost of flour. However,

prices in international trade have been affected by export subsidies given by major exporting countries. As a result, export flour prices became relatively cheaper than those for wheat although price movements of wheat and flour have followed the same broad trend (Table 3). The average differences between prices of wheat and flour from 1966 to 1970 are $8.94 per metric ton for the E.E.C.; $20.09 per metric ton for Australia; $26.96 per metric ton for the U.S. and $35.61 per metric ton for Canada. These price differentials reflect the difference in the degree of subsidy as well as the characteristics of the wheats of the major exporters. The differential has narrowed most sharply for the E.E.C. where it formerly exceeded $50.00. The U.S. margin has dropped by about $10.00 per ton since the late 1950's. In contrast the Canadian and Australian differentials have increased. It is, therefore, not without reason that the world market for flour is dominated by the E.E.C. and the U.S. who have extensive measures of export assistance to make their flour prices more competitive at the international level. Australian flour, though priced above the E.E.C. flour, has consistently been lower than the North American flour. However, it has not been able to capture substantial share of the world market for flour. This, perhaps, reflects the characteristics of the different wheats.

World trade in flour has, therefore, been substantially influenced by export subsidy. Indeed, both the E.E.C. and the U.S. who have extensive export subsidies have accounted for over 60 percent of the total world flour trade since the early 1960's. In 1970/71, they shared 36.1 percent and 25.3 percent respectively of the world market for flour (Table 4).

# CHAPTER 3

## DIMENSIONS AND PROBLEMS OF THE CANADIAN FLOUR MILLING INDUSTRY

The Canadian Flour Milling Industry (CFMI) has contributed to the Canadian economy as an employer, as a user of Canadian wheat, and as a processor and exporter. A measure of the contribution of the CFMI to the Canadian grain producers can be seen in the fact that an average of 15.5 percent of the Canadian wheat crop during the period 1965/66 to 1970/71 was consumed annually by the CFMI in flour production (Table 6).

The contribution of the CFMI as an employer has declined substantially due to changes in milling technology and automation in production processes. Total number of employees in the CFMI has declined from the record high of 8285 in 1947 to 3471 in 1970 (Table 6).

The average annual production of flour during the period of 1945/46 to 1949/50 was 107 million bushels. This fell to 88 million bushels in the period of 1966/67 to 1970/71 (Table 6). Western mills have absorbed the main portion of the decline (Table 6). Eastern mills have benefited from a steady increase in grindings of Ontario winter wheat. Milling of Ontario winter wheat has more than doubled since the war increasing from about four million bushels to eight million bushels.

Exports of wheat flour have contributed substantially to total Canadian wheat sales in the past two decades. However, Canada's

TABLE 6

EMPLOYMENT, PRODUCTION AND EXPORTS OF THE CANADIAN FLOUR MILLING INDUSTRY, 1945/46 to 1970/71 CROP YEARS

(IN THOUSANDS OF BUSHELS, WHEAT EQUIVALENT)

| | TOTAL NO. OF EMPLOYEES[a] (1) | WHEAT MILLED IN EASTERN CANADA (2) | WHEAT MILLED IN WESTERN CANADA (3) | TOTAL WHEAT MILLED IN CANADA (4) | WHEAT PRODUCTION IN CANADA (5) |
|---|---|---|---|---|---|
| 1945-46 | 7,511 | 59,901 | 58,173 | 118,074 | 316,320 |
| 1946-47 | 8,036 | 62,113 | 65,662 | 127,775 | 411,601 |
| 1947-48 | 8,285 | 54,327 | 55,495 | 109,822 | 338,506 |
| 1948-49 | 7,124 | 46,396 | 44,501 | 90,897 | 381,413 |
| 1949-50 | 6,582 | 44,862 | 45,221 | 90,083 | 366,028 |
| 1950-51 | 6,356 | 51,407 | 55,342 | 106,749 | 466,490 |
| 1951-52 | 6,358 | 49,291 | 55,203 | 104,494 | 553,678 |
| 1952-53 | 6,464 | 49,656 | 57,071 | 106,727 | 701,973 |
| 1953-54 | 6,435 | 43,977 | 47,878 | 91,855 | 634,040 |
| 1954-55 | 4,934 | 44,172 | 48,235 | 92,407 | 331,981 |
| 1955-56 | 6,389 | 44,281 | 47,489 | 91,770 | 519,178 |
| 1956-57 | 6,189 | 42,600 | 42,550 | 85,150 | 573,040 |
| 1957-58 | 5,956 | 46,864 | 45,425 | 92,289 | 392,508 |
| 1958-59 | 4,412 | 46,996 | 43,147 | 90,143 | 397,730 |
| 1959-60 | 4,234 | 44,408 | 46,982 | 91,390 | 444,520 |
| 1960-61 | 4,173 | 43,094 | 46,637 | 89,731 | 518,379 |
| 1961-62 | 3,953 | 43,878 | 44,363 | 88,241 | 283,394 |
| 1962-63 | 4,265 | 44,475 | 34,314 | 78,789 | 565,585 |
| 1963-64 | 4,392 | 51,962 | 59,709 | 111,671 | 723,500 |
| 1964-65 | 4,503 | 49,295 | 37,914 | 87,209 | 600,726 |
| 1965-66 | 4,284 | 52,339 | 45,587 | 97,926 | 649,412 |
| 1966-67 | 4,350 | 51,617 | 38,468 | 90,085 | 827,338 |
| 1967-68 | 3,981 | 49,283 | 35,486 | 84,769 | 592,920 |
| 1968-69 | 3,558 | 54,985 | 30,064 | 85,049 | 649,844 |
| 1969-70 | 3,510 | 60,898 | 29,659 | 90,557 | 684,276 |
| 1970-71 | 3,471 | 59,918 | 27,549 | 87,467 | 331,519 |

[a]Calendar years 1945 to 1970.

TABLE 6 (CONTINUED)

| | FLOUR PRODUCTION AS % OF WHEAT PRODUCTION (6) | CANADA'S EXPORT OF FLOUR (7) | FLOUR EXPORTS AS % OF FLOUR PRODUCTION (8) |
|---|---|---|---|
| 1945-46 | 35.1 | 62,038 | 52.6 |
| 1946-47 | 31.0 | 79,470 | 62.2 |
| 1947-48 | 32.4 | 61,477 | 56.0 |
| 1948-49 | 23.8 | 48,094 | 52.9 |
| 1949-50 | 24.6 | 45,680 | 50.7 |
| 1950-51 | 22.9 | 55,922 | 52.4 |
| 1951-52 | 18.9 | 51,103 | 48.9 |
| 1952-53 | 15.2 | 56,501 | 52.9 |
| 1953-54 | 14.5 | 56,246 | 61.2 |
| 1954-55 | 27.8 | 40,621 | 44.0 |
| 1955-56 | 17.7 | 40,000 | 43.6 |
| 1956-57 | 14.9 | 33,540 | 39.4 |
| 1957-58 | 23.5 | 40,381 | 43.8 |
| 1958-59 | 22.7 | 37,125 | 41.2 |
| 1959-60 | 20.6 | 36,970 | 40.5 |
| 1960-61 | 17.3 | 35,682 | 39.8 |
| 1961-62 | 31.1 | 31,953 | 36.2 |
| 1962-63 | 13.9 | 27,265 | 34.6 |
| 1963-64 | 15.4 | 54,910 | 49.2 |
| 1964-65 | 14.5 | 31,542 | 36.2 |
| 1965-66 | 15.1 | 38,125 | 38.9 |
| 1966-67 | 10.9 | 31,851 | 35.4 |
| 1967-68 | 14.3 | 24,690 | 29.1 |
| 1968-69 | 13.1 | 24,622 | 29.0 |
| 1969-70 | 13.2 | 26,963 | 29.8 |
| 1970-71 | 26.4 | 24,975 | 28.6 |

Source:

Columns 1, 2, 3 and 4: Dominion Bureau of Statistics, Agriculture Division, and Board of Grain Commissioners for Canada, Statistics Branch, Grain Trade of Canada, Cat. No. 22-201 (Ottawa, Ontario: Queen's Printer, Annual).

Columns 5 and 7: The Canadian Wheat Board, Annual Report 1969-70 & 1970-71,((Winnipeg, Manitoba): (n.n.), annual).

Column 6: Col. (4) divided by Col. (5).
Column 8: Col. (7) divided by Col. (4).

export of flour has declined since the 1950's (Table 6) with the exception of the 1963/64 crop year when the Canadian Wheat Board contracted an export of 22 million bushels of flour to the U.S.S.R. During the period 1945/46 to 1949/50, average annual export of flour was around 59 million bushels, about 54.9 percent of the annual flour production. This fell to around 29 million bushels, about 30.4 percent of the average annual production of flour in the period 1966/67 to 1970/71 (Table 6). However, the CFMI still has relatively high percentage of flour production being exported. The U.S. and the E.E.C. which are Canada's major competitors in world flour markets exported only about 10.3 percent and 11.9 percent of their average annual production respectively in the period 1966/67 to 1970/71.[1] The relatively high percentage of flour production that has traditionally been exported by the CFMI probably accounts largely for Canada's reluctance to give export subsidies to the CFMI.

World trade in flour has risen almost steadily in the past two decades, increasing from an average of about 4.5 million metric tons in the 1950's and to over six million metric tons in the early 1960's. It has leveled off at around 5.5 million metric tons in the late 1960's (Table 7). However, in a period of expansion of world flour trade, Canada not only has failed to obtain a proportion of the increase,

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[1] Figures are derived from the International Wheat Council, World Wheat Statistics, (London: Bradley & Son Ltd., annual).

TABLE 7

THE WORLD AND CANADA'S EXPORTS OF FLOUR

(IN THOUSANDS M.T.)

| | WORLD EXPORTS OF FLOUR | CANADA'S EXPORTS OF FLOUR | CANADA AS % OF WORLD |
|---|---|---|---|
| 1950-51[1] | 4,422 | 1,489 | 33.7 |
| 1951-52[1] | 4,509 | 1,414 | 31.4 |
| 1952-53[1] | 4,687 | 1,554 | 33.2 |
| 1953-54 | 4,192 | 1,295 | 30.9 |
| 1954-55 | 4,322 | 1,149 | 26.6 |
| 1955-56 | 4,635 | 1,016 | 21.9 |
| 1956-57 | 4,941 | 963 | 19.5 |
| 1957-58 | 5,718 | 1,078 | 18.9 |
| 1958-59 | 5,753 | 1,005 | 17.5 |
| 1959-60 | 5,864 | 996 | 17.0 |
| 1960-61 | 6,038 | 980 | 16.2 |
| 1961-62 | 6,967 | 865 | 12.4 |
| 1962-63 | 6,123 | 772 | 12.6 |
| 1963-64 | 7,077 | 1,489 | 21.0 |
| 1964-65 | 5,966 | 909 | 15.2 |
| 1965-66 | 5,596 | 990 | 17.4 |
| 1966-67 | 5,814 | 912 | 15.7 |
| 1967-68 | 4,953 | 634 | 12.8 |
| 1968-69 | 5,435 | 645 | 11.9 |
| 1969-70[2] | 5,877 | 772 | 13.1 |
| 1970-71[2] | 5,559 | 685 | 12.3 |

[1]Figures are provisional because no final figures by destinations are available for these years.

[2]Provisional.

Source:

International Wheat Council, World Wheat Statistics, (London: Bradley & Son Ltd., Annual) and World Trade in Wheat Flour, Secretariat Paper No. 5, (London, Bradley & Son Ltd., 1965).

but also has lost ground in absolute terms. In the 1950/51 crop year, Canada's share of the world flour exports was 33.7 percent, but in 1970/71, this fell to 12.3 percent (Table 7).

The Canadian share of the world markets for flour has declined in all regions of the world except Central America (Table 8). The exception of Central America was the consequence of the large contracted sales to Cuba. Excluding the Cuban market, Canada has actually experienced a falling market share in the remainder of Central America, the extent of the loss being shown by the market share dropping from 38.0 percent in 1954/55 to 10.5 percent in 1970/71. However the most significant loss of flour markets for Canada has occurred in the regions of Asia and South America. At 1970/71 import volumes by regions, these represent losses of 355.5 thousand metric tons and 74.5 thousand metric tons respectively.[2]

Several factors have contributed to, or have at least been associated with, the decline in the share of the world flour markets by the CFMI. While it is difficult and perhaps even unnecessary to gauge the relative importance of these factors, the following can be identified:

1. The modernization and consolidation of milling capacity in Europe following World War II.

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[2]Figures are obtained by multiplying the difference in Canadian shares of the imports of flour in each region between 1954/55 and 1970/71 in Table 8 by the 1970/71 import volumes in the respective region in Table 5.

TABLE 8

CANADIAN SHARES OF THE IMPORTS OF FLOUR

IN WORLD MARKETS BY REGIONS IN PERCENTAGE:

(1954/55 to 1970/71)

| YEAR | EUROPE | CENTRAL AMERICA INCLUDING CUBA | CENTRAL AMERICA LESS CUBA | SOUTH AMERICA | ASIA | AFRICA | OCEANIA |
|---|---|---|---|---|---|---|---|
| 1954/55 | 48.0 | 38.0 | - | 28.0 | 18.5 | 9.6 | 3.8 |
| 1955/56 | 32.1 | 37.6 | - | 22.3 | 14.8 | 11.8 | 4.2 |
| 1956/57 | 44.3 | 30.9 | - | 24.2 | 13.3 | 7.9 | 2.8 |
| 1957/58 | 42.8 | 33.0 | - | 20.2 | 17.3 | 4.3 | 3.0 |
| 1958/59 | 32.2 | 35.1 | - | 15.3 | 12.8 | 6.1 | 1.0 |
| 1959/60 | 30.8 | 32.0 | - | 4.6 | 13.3 | 7.2 | 1.4 |
| 1960/61 | 37.6 | 38.3 | - | 5.9 | 10.5 | 8.6 | 1.8 |
| 1961/62 | 29.5 | 31.0 | - | 1.8 | 9.4 | 9.2 | 0.3 |
| 1962/63 | 43.0 | 24.0 | - | 1.7 | 5.0 | 7.4 | 0.5 |
| 1963/64 | 44.0 | 46.8 | 22.2 | 1.7 | 5.4 | 3.5 | 0.4 |
| 1964/65 | 50.5 | 35.4 | 20.8 | 2.1 | 4.2 | 5.0 | 0.3 |
| 1965/66 | 50.1 | 68.6 | 24.7 | 1.7 | 7.8 | 3.6 | 1.3 |
| 1966/67 | 50.2 | 63.5 | 19.1 | 1.0 | 6.0 | 5.3 | 1.8 |
| 1967/68 | 35.8 | 53.5 | 14.6 | 1.5 | 5.0 | 4.0 | 1.7 |
| 1968/69 | 29.5 | 45.8 | 9.2 | 2.6 | 4.8 | 6.5 | 1.7 |
| 1969/70 | 25.8 | 76.7 | 12.6 | 1.1 | 5.8 | 3.8 | 1.4 |
| 1970/71 | 26.2 | 66.5 | 10.5 | 1.6 | 5.9 | 4.5 | 0.8 |

- Not Available

Source:

Food and Agriculture Organization, Grain Exports by Sources and Destination, (Rome: F.A.O., Annual); and World Grain Trade Statistics, (Rome: F.A.O., Annual).

2. The trend towards wheat self-sufficiency in Europe which meant milling capacity was increased to utilize greater quantities of domestic wheat.
3. The creation of excess milling capacity in continental Europe and the need for flour exports from that area.
4. The trend in underdeveloped countries whereby mill construction became a national must or goal as well as status symbol.
5. Increased subsidy on the exports of flour by major competitors.
6. The development of the Chorleywood process in the baking industry allows the use of a much higher percentage of weak flours (milled from lower-quality wheats). Therefore, the demand for Canada's strong flour has declined substantially.

Paradoxically, the inability of the CFMI to compete in the world flour markets is partly due to the institutional structure of the Canadian wheat industry and partly due to governmental intervention. The Canadian Wheat Board (CWB) as a monopolist in the Canadian wheat industry sets the prices of wheat and hence has direct effect on the cost of raw material of the CFMI which has limited or no scope for bargaining on the price of wheat. Furthermore, because the CFMI has to purchase its raw material, wheat at f.o.b. prices, it is in a disadvantageous position to compete in foreign markets owing to the higher transportation costs for flour than wheat. The extra cost of exporting flour versus wheat due to ocean freight has risen steadily.

For example, on shipment to U.K., the difference has increased from less than 20¢ per 100 pounds in 1963 to more than 35¢ per 100 pounds in 1967.[3] The difference in transportation costs gives incentives to the flour importing countries to establish mills and to import wheat in lieu of flour or to switch to other sources of supply.

This incentive for importing countries to prefer wheat posed little difficulty to the CFMI as long as Europe remained preoccupied with post-war reconstruction during which the demand for food was large. However, as Europe recovered from the war, the problem took on major significance for the CFMI. The Canadian Government, recognizing this situation, introduced the Export Flour Adjustments in 1957/58, after the CFMI, in 1956/57, sustained its lowest export of flour yet experienced (Table 6). The export Flour Adjustments were designed to offset the higher subsidization of flour than wheat exports by competitors. Unfortunately for the CFMI, these Adjustments were terminated in 1964.

The CFMI was also precluded from cutting costs in other ways. The investigation into an alleged combine in the CFMI by the Canada Combines Investigation Commission in 1948 and its aftermath reportedly had a restraining on the industry in attempts to rationalizing its operation by horizontal integration. In fact, such rationalization as

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[3] Figures are derived from the Canadian National Millers Association, A Submission to the Canadian Grain Marketing Review Committee, November, 1970.

has occurred has largely come through attrition rather than a well conceived plan.

In contrast to the Canadian situation, mills built after the war in Europe and elsewhere are more efficient because they are equipped with newer machines and use newer techniques of production. In addition, the formation of the European Economic Community has raised new barriers to exports of the CFMI to the member countries.

Indeed, the CFMI is being caught in the middle, encountering problems both from within and without Canada. On the one hand it has no control of the prices of its input and on the other hand it has to meet the competition of the newer mills in other countries.

Ironically, the CFMI not only has to compete with foreign flour exporters but also has to compete with the exports of Canadian wheat. In fact, the CFMI allegedly operates at a disadvantage because it is deprived of the privilege of wheat selection. Canadian millers contend they are restricted to the grades of wheat made available to them by the Canadian Wheat Board while foreign wheat buyers can often reserve specific grades of wheat in the forward position.[4] Thereby, millers say they are sometimes unable to use the optimum grade of wheat for production of flour for different markets. Whether this problem is a serious or even frequent one is not readily determined, but a basis for its existence can be recognized in the monopoly position of the Canadian Wheat Board in domestic sales of

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[4]Ibid., p. 9.

wheat for milling from Western Canada.[5]

One noticeable change in the CFMI since 1945 is the decline in the number of flour mills (Table 9). The total number of flour mills fell from 196 in 1945 to 37 in 1970. However, this decline in the number of flour mills has little effect on the milling capacity in Canada. The annual milling capacity fell from 122,356 thousand bushels in 1945 to 116,547 thousand bushels in 1970.[6]

The decrease in the number of flour mills in Canada was partly the consequence of the decline in Canadian exports of flour. The decline in exports was sustained mainly by mills in Western Canada as indicated by the difference between annual production and consumption. This difference fell from over 45 million bushels in the 1940's to about 20 million bushels in the late 1960's (Table 10). The number of mills in Manitoba, Saskatchewan and Alberta fell from 21, 29 and 32 in 1945 to 3, 3, and 5 in 1970 respectively (Table 9).

Technological change was another cause of the decrease in the number of flour mills in Canada. Many of the mills were built before 1940 and cannot compete with the modern mills in Europe and some other countries. Because their production methods and machines are obsolete,

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[5]Wheat imports for milling are precluded by Wheat Board licensing restrictions. Given a captive home demand and a logical desire to maintain flexibility in meeting foreign demand by having ample selection of grades, the Wheat Board would rationally limit the grades made available for domestic use. The same limitation might extend to purchases of wheat for milling of flour for export.

[6]The figures are derived from Canada Year Book 1946 and 1972.

TABLE 9

NUMBER OF FLOUR MILLS IN CANADA

| | CANADA | P.E.I. | NOVA SCOTIA | QUEBEC | ONTARIO | MANITOBA | SASK. | ALBERTA | B.C. |
|---|---|---|---|---|---|---|---|---|---|
| 1945 | 196 | - | 4[a] | 28 | 82 | 21 | 29 | 32[b] | - |
| 1946 | 184 | 1 | 1[a] | 24 | 80 | 20 | 29 | 29 | - |
| 1947 | 174 | - | - | 19 | 76 | 21 | 28 | 30 | - |
| 1948 | 184 | ) | | | | | | | ( |
| 1949 | 133 | ) N.A. | | | | | | N.A. | ( |
| 1950 | 118 | ) | | | | | | | ( |
| 1951 | 108 | ) | | | | | | | ( |
| 1952 | 100 | - | - | 4 | 59 | 8 | 14[c] | 15 | - |
| 1953 | 95 | - | - | 4 | 55 | 8 | 14[c] | 14 | - |
| 1954 | 85 | - | - | 4 | 50 | 7 | 12[c] | 12 | - |
| 1955 | 77 | - | - | 4 | 45 | 7 | 10[c] | 11 | - |
| 1956 | 76 | - | - | 4 | 44 | 7 | 10[c] | 11 | - |
| 1957 | 59 | - | - | 4 | 31 | 6 | 9[c] | 9 | - |
| 1958 | 57 | - | - | 4 | 30 | 5 | 10[c] | 8 | - |
| 1959 | 57 | - | - | 4 | 30 | 5 | 10[c] | 8 | - |
| 1960 | 55 | - | - | 4 | 30 | 5 | 8[c] | 8 | - |
| 1961 | 54 | - | - | 4 | 29 | 5 | 6 | 8 | 2 |
| 1962 | 55 | - | - | 4 | 30 | 5 | 6 | 8 | 2 |
| 1963 | 53 | - | - | 5 | 29 | 4 | 5 | 7 | 3 |
| 1964 | 55 | - | - | 7 | 28 | 4 | 5 | 7 | 4 |
| 1965 | 51 | 1 | - | 7 | 25 | 4 | 5 | 7 | 2 |
| 1966 | 52 | 1 | - | 7 | 25 | 4 | 6 | 7 | 2 |
| 1967 | 51 | 1 | - | 8 | 24 | 4 | 5 | 7 | 2 |
| 1968 | 42 | 1 | 1 | 7 | 17 | 4 | 4 | 7 | 1 |
| 1969 | 41 | 1 | 1 | 7 | 17 | 3 | 3 | 7 | 2 |
| 1970 | 37 | - | 1 | 6 | 17 | 3 | 3 | 5 | 2 |

[a]New Brunswick and Nova Scotia. [b]Alberta and B.C. [c]Sask. and B.C.

TABLE 9 (CONTINUED)

Source:

Dominion Bureau of Statistics, Agriculture Division, and Board of Grain Commissioners for Canada, Statistics Branch, Grain Trade of Canada 1945-46 and 1946-47, Cat. No. 22-201 (Ottawa, Ontario: Queen's Printer, Annual): and Dominion Bureau of Statistics, Manufacturing and Primary Industries Division, Flour Mills (Ottawa, Ontario: Information Canada, Annual). (Information for future years will be included in Cat. No. 32-228, Flour and Breakfast Cereal Products Industry.)

TABLE 10

PRODUCTION AND CONSUMPTION OF FLOUR
IN EASTERN AND WESTERN CANADA
1945/46 to 1970/71 CROP YEARS
(IN 1,000 BUSHELS WHEAT EQUIVALENT)

| YEAR | EASTERN CANADA | | |
|---|---|---|---|
| | PRODUCTION | CONSUMPTION[1] | DIFFERENCE |
| 1945/46 | 59,901 | 28,716 | 31,185 |
| 1946/47 | 62,113 | 27,285 | 34,828 |
| 1947/48 | 54,327 | 24,282 | 30,045 |
| 1948/49 | 49,396 | 21,569 | 27,827 |
| 1949/50 | 44,862 | 24,459 | 20,403 |
| 1950/51 | 51,407 | 26,481 | 24,926 |
| 1951/52 | 49,291 | 26,878 | 22,413 |
| 1952/53 | 49,656 | 27,085 | 22,571 |
| 1953/54 | 43,977 | 23,939 | 20,038 |
| 1954/55 | 44,172 | 27,750 | 16,422 |
| 1955/56 | 44,281 | 27,761 | 16,520 |
| 1956/57 | 42,600 | 27,723 | 14,877 |
| 1957/58 | 46,864 | 28,080 | 18,784 |
| 1958/59 | 46,996 | 28,438 | 18,558 |
| 1959/60 | 44,408 | 29,288 | 16,120 |
| 1960/61 | 43,094 | 29,914 | 13,180 |
| 1961/62 | 43,878 | 31,384 | 12,494 |
| 1962/63 | 44,475 | 32,741 | 11,734 |
| 1963/64 | 51,962 | 31,643 | 20,319 |
| 1964/65 | 49,295 | 30,921 | 18,374 |
| 1965/66 | 52,339 | 32,733 | 19,606 |
| 1966/67 | 51,617 | 32,694 | 18,923 |
| 1967/68 | 49,283 | 32,729 | 16,554 |
| 1968/69 | 54,985 | 32,448 | 22,537 |
| 1969/70 | 60,898 | 33,773 | 27,125 |
| 1970/71 | 59,918 | 33,592 | 26,326 |

[1]Calendar year data (1945-46 crop year = 1945 calendar year) derived by multiplying population by per capita consumption.

TABLE 10 (CONTINUED)

| YEAR | WESTERN CANADA | | |
|---|---|---|---|
| | PRODUCTION | CONSUMPTION[1] | DIFFERENCE |
| 1945/46 | 58,173 | 10,958 | 47,215 |
| 1946/47 | 65,662 | 10,390 | 55,272 |
| 1947/48 | 55,495 | 9,485 | 46,010 |
| 1948/49 | 44,501 | 8,222 | 36,279 |
| 1949/50 | 45,221 | 8,979 | 36,242 |
| 1950/51 | 55,342 | 9,696 | 45,646 |
| 1951/52 | 55,203 | 9,779 | 45,424 |
| 1952/53 | 57,071 | 9,809 | 47,262 |
| 1953/54 | 47,878 | 8,688 | 39,190 |
| 1954/55 | 48,235 | 10,086 | 38,149 |
| 1955/56 | 47,489 | 10,071 | 37,418 |
| 1956/57 | 42,550 | 10,075 | 32,475 |
| 1957/58 | 45,425 | 10,178 | 35,247 |
| 1958/59 | 43,147 | 10,305 | 32,842 |
| 1959/60 | 46,982 | 10,603 | 36,379 |
| 1960/61 | 46,637 | 10,830 | 35,807 |
| 1961/62 | 44,363 | 11,354 | 33,009 |
| 1962/63 | 34,314 | 10,224 | 24,090 |
| 1963/64 | 59,709 | 11,390 | 48,319 |
| 1964/65 | 37,914 | 11,164 | 26,750 |
| 1965/66 | 45,587 | 11,794 | 33,793 |
| 1966/67 | 38,468 | 11,497 | 26,971 |
| 1967/68 | 35,486 | 11,797 | 23,689 |
| 1968/69 | 30,064 | 11,749 | 18,315 |
| 1969/70 | 26,659 | 12,289 | 14,370 |
| 1970/71 | 27,549 | 12,268 | 15,281 |

Source:

Dominion Bureau of Statistics, Agriculture Division and Board of Grain Commissioners for Canada, Statistics Branch, Grain Trade in Canada, Cat. No. 22-201 (Ottawa, Ontario: Queen's Printer, annual). The Northwestern Miller, January, 1971, 1972. Canada Statistics, Estimated Population of Canada by Provinces, Cat. No. 91.201 (Ottawa, Ontario, Queen's Printer, annual).

these mills face severe competition in the world flour markets and some have been forced to close.

Partially offsetting the decline in export volume has been the slow increase in milling for the Canadian domestic market. There has been a slight shift away from breadstuffs in the national diet, but this seems to have stabilized at around 130 lbs. per capita and population growth is resulting in higher consumption (Table 11).

It can be deduced that the Canadian domestic market has increased by the extent of 15 million bushels as population has increased from 13 million to 21 million. This offsets the decrease in per capita consumption of flour of slightly over 25 percent.

Some mills have tried to protect their domestic business by diversification, that is, by investing in bakeries. The ownership or control of bakeries by mills guarantees the mills an outlet for part of their output. The effectiveness of this action is declining with the increasing dominance of supermarkets in baking and distribution of bread. Furthermore, by competing in the bakery field, mills lose volume in other outlets and this loss can offset the additional earnings in the bakery interest.

There is over-capacity in the CFMI in spite of the diversification and the decline in the number of flour mills. Over-capacity has resulted from:

1. The heavy demands for flour during the two world wars and the period of food shortage following World War II.
2. The early optimism of the CFMI in a continuing export

TABLE 11

FLOUR CONSUMPTION IN CANADA

| CROP YEARS | TOTAL DOMESTIC DISAPPEARANCE '000 POUNDS | PER CAPITA DOMESTIC DISAPPEARANCE POUNDS | CROP YEARS | TOTAL DOMESTIC DISAPPEARANCE '000 POUNDS | PER CAPITA DOMESTIC DISAPPEARANCE POUNDS |
|---|---|---|---|---|---|
| 1922-23 | 1,687,124* | 188.4 | 1946-47 | 2,285,396 | 183.9 |
| 1923-24 | 1,687,532* | 186.2 | 1947-48 | 2,086,170 | 164.1 |
| 1924-25 | 1,592,070* | 171.8 | 1948-49 | 1,828,989 | 139.2 |
| 1925-26 | 1,605,923** | 171.6 | 1949-50 | 2,024,257 | 149.2 |
| 1926-27 | 1,693,052 | 177.1 | 1950-51 | 2,198,582 | 158.3 |
| 1927-28 | 1,808,393 | 185.4 | 1951-52 | 2,241,979 | 157.0 |
| 1928-29 | 1,794,993 | 180.4 | 1952-53 | 2,247,274 | 153.1 |
| 1929-30 | 1,711,673 | 168.9 | 1953-54 | 1,990,334 | 131.8 |
| 1930-31 | 1,812,643 | 175.9 | 1954-55 | 2,307,701 | 148.5 |
| 1931-32 | 1,818,463 | 173.9 | 1955-56 | 2,302,186 | 144.6 |
| 1932-33 | 1,899,927 | 179.5 | 1956-57 | 2,304,986 | 141.0 |
| 1933-34 | 1,875,867 | 175.4 | 1957-58 | 2,337,402 | 138.2 |
| 1934-35 | 1,875,718 | 173.6 | 1958-59 | 2,356,481 | 136.1 |
| 1935-36 | 1,954,113 | 179.2 | 1959-60 | 2,423,867 | 136.9 |
| 1936-37 | 1,916,403 | 174.1 | 1960-61 | 2,474,943 | 136.8 |
| 1937-38 | 1,865,972 | 168.0 | 1961-62 | 2,592,106 | 140.6 |
| 1938-39 | 2,056,756 | 183.3 | 1962-63 | 2,335,299 | 124.3 |
| 1939-40 | 2,155,945 | 191.1 | 1963-64 | 2,603,867 | 136.0 |
| 1940-41 | 1,848,405 | 164.2 | 1964-65 | 2,552,178 | 130.9 |
| 1941-42 | 1,854,055 | 165.5 | 1965-66 | 2,700,932 | 136.0 |
| 1942-43 | 2,102,266 | 188.3 | 1966-67 | 2,636,748 | 130.2 |
| 1943-44 | 2,051,994 | 183.2 | 1967-68 | 2,703,996 | 131.1 |
| 1944-45 | 2,072,671 | 183.7 | 1968-69 | 2,682,908 | 128.1 |
| 1945-46 | 2,339,771 | 197.2 | 1969-70 | 2,798,506 | 131.6 |
| | | | 1970-71+ | 2,785,244 | 129.2 |

*Stocks not available. **Estimate for stocks at beginning of period. +Preliminary.

Source: The Northwestern Miller, January, 1971, 1972.

market for flour.

3. The continuing loss of the world flour markets by the CFMI.

# CHAPTER 4

## THE CONCEPT OF EFFECTIVE SUBSIDY

The practice of subsidizing flour exports by major competitors has been recognized as one of the main causes for the decline in exports of the CFMI. To facilitate the exposition of the intensity of this problem and the basis and means for its resolution, a conceptual framework for analysing the effectiveness of subsidy is, therefore, desirable. The purpose of this chapter is to derive a conceptual framework for the treatment of export subsidies in general. Some reference is made to its application to flour subsidies; however the main application to that commodity is deferred to Chapter 5.

The concept of effective subsidy is a corollary to the concept of effective protection which was introduced to the economic literature in 1955 by Professor Clarence L. Barber.[1] The original concept of effective protection was limited mainly to the estimation of the effectiveness of a given tariff (the nominal tariff rate) in providing protection to domestic producers against foreign competitors. With the accomplishments of the Kennedy Round trade negotiations, which were primarily a tariff-cutting series, non-tariff barriers have supplanted tariffs as the principal means of protecting domestic industries against foreign competitors. Therefore, the concept of

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[1] C. L. Barber, "Canadian Tariff Policy", The Canadian Journal of Economics and Political Science, XXI: 513-530, November, 1955.

effective protection has been modified to include the estimation of the effects of non-tariff barriers.[2]

In respect of agricultural products, non-tariff measures have long been the major means of protecting domestic producers from international competition, ever since tariffs, except at astronomical rates, were found to be ineffective in the 1930's. Coinciding with the advent of non-tariff barriers imposed by importing countries has been the proliferation of another non-tariff device used by exporting countries--the export subsidy, which has been a perennial bone of contention to competing exporters. A concept in which export subsidies are treated explicitly is therefore appropriate for dealing with analytical questions of agricultural production and trade involving commodities receiving high export subsidies.

While such a concept would be relevant to products ranging from high to little or no processing, its application is most obvious for processed agricultural products on which export subsidies are given. However, the concept could apply equally to the primary production level. An important case is that of flour, the semi-processed form of wheat, the largest traded commodity in world agriculture. The case is important not only because of the proliferation of flour export subsidies by some major exporters in the last two decades but

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[2]Examples of this are: R. E. Baldwin, Non-tariff Distortions of International Trade (Washington, D.C.: Brookings Institution, 1970); and L. J. Wipf, "Effective Protection: An Analysis of Protection in the U.S. Agricultural Production and Processing Industries" (unpublished Ph.D. dissertation, University of Wisconsin, 1970).

also because, in the Canadian context, export subsidies on flour exports by large competitors are generally thought to be a main cause of the decline in the Canadian share of the world market.[3]

A conceptual approach to the matter of effective subsidy must distinguish between: (a) production of the commodity in the exporting country for the export market, (b) production of the commodity in the exporting country for the domestic market, (c) production of the commodity in the importing country for the home market, and (d) production and consumption of commodities related to the given commodity as substitutes or inputs. The concern of the present investigation is only that of (a), for which the effective subsidy concept is first developed for the general model and is then applied in the case of flour. However, the same concept with slight modifications is considered to be applicable to the other analytical areas mentioned and to other agricultural commodities, and in a more appropriate manner than the original concept of effective protection. The main emphasis is on export subsidies, but the net overall effect of national policies on input prices is also considered.

In comparing the magnitude of export subsidy given by various countries, the nominal rate of subsidy could initially be considered to be analogous to the nominal rate of tariff in the concept of effective protection. Also analogously, the effective rate of subsidy could therefore be defined as the maximum proportion by which the

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[3]S. C. Hudson, Future Market Outlets for Canadian Wheat and Other Grains, Special Study No. 11 (Ottawa, Ontario: Economic Council of Canada, January, 1970), p. 229.

export subsidy permits resources in the production activity to exceed the value added that they would have in the absence of such subsidy. The basic formula is as follows:

$$g_j = \frac{V_j' - V_j}{V_j}$$

where: $g_j$ = effective rate of subsidy for industry j

$V_j'$ = value added per unit of j in the industry j made possible by the export subsidy, and

$V_j$ = value added per unit of j in the industry j in the absence of export subsidy.

Normally, $V_j'$ and $V_j$ in the concept of effective protection are defined respectively to represent value added with and without tariffs on inputs and on output. Usually, the effects of other trade distortions[4] than tariffs on the input prices are not considered. The prevalence of non-tariff trade distortions in agriculture makes it necessary in calculating the effective rate of subsidy to explicitly take into account the combined trade distortions of the inputs. Various degrees of offset may occur between the export subsidy and input price distortions. Such distortions are considered below in the extension of the basic formula.

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[4]The term "trade distortions" includes all distorting measures, tariff as well as non-tariff. It includes not only measures that restrict trade but also such measures as quotas and government aids that artifically increase or decrease the price level or the level of trade of inputs.

Let the value of a unit of output in any industry in the absence of subsidy be equal to 1. Then,

$$V_j = 1 - \sum_{i=1}^{n} A_{ij}$$

$$V_j' = (1 + S_j) - \left[ \sum_{i=1}^{n} A_{ij} \ (1 + D_i) \right]$$

Where: $A_{ij}$ = the production coefficient or input-output coefficient for the $i^{th}$ intermediate input in the industry j. (Proportion of unit sales value of output j represented by intermediate input i);

$\sum_{i=1}^{n} A_{ij}$ = the proportion of the sales value of a final output of the industry j in the absence of subsidy represented by the total value of intermediate inputs;

$S_j$ = nominal rate of export subsidy for the industry j; and

$D_i$ = the overall effect of trade distortions on price of the $i^{th}$ input in the industry j.

Therefore:

$$g_j = \frac{(1 + S_j) - \left[ \sum_{i=1}^{n} A_{ij} \ (1 + D_i) \right] - (1 - \sum_{i=1}^{n} A_{ij})}{1 - \sum_{i=1}^{n} A_{ij}}$$

$$= \frac{S_j - \sum_{i=1}^{n} A_{ij} \ D_i}{1 - \sum_{i=1}^{n} A_{ij}}$$

This formula implies that:

If $S_j = D_i$, then $g_j = S_j = D_i$

If $S_j > D_i$; then $g_j > S_j > D_i$

If $S_j < D_i$, then $g_j < S_j < D_i$

If $S_j < \sum_{i=1}^{n} A_{ij} D_i$, then $g_j < 0$

If $S_j = \sum_{i=1}^{n} A_{ij} D_i$, then $g_j = 0$, and

If $S_j = 0$ and $D_i < 0$, then $g_j > 0$.

Therefore, the effective rate of subsidy, $g_j$, can be positive, negative or equal to zero. It can be greater, smaller or equal to the nominal rate of subsidy. Therefore, the rate of effective subsidy is here defined as the maximum proportion by which value added changes due to the export subsidy and input price distortions.

There is the problem of estimating the trade distortions of the inputs $D_i$. Some trade distortions such as quotas and standards of quality can hardly be quantified. However, ignoring transportation costs, the ratio of domestic to world prices of the inputs could be used to represent the distortions. That is:

$$D_i = \frac{P_{dij}}{P_{wij}} - 1$$

where: $P_{dij}$ = domestic price of the $i^{th}$ input in the industry j, and

$P_{wij}$ = world price of the $i^{th}$ input in the industry j.

The working formula for calculating the effective rate of subsidy for the industry j becomes:

$$g_j = \frac{S_j - \sum_{i=1}^{n} A_{ij} \left[ \frac{P_{dij}}{P_{wij}} - 1 \right]_j}{1 - \sum_{i=1}^{n} A_{ij}}$$

Unlike tariffs which have effects on the price levels, export subsidies are usually given directly to the producers and therefore do not have much influence on price levels of all inputs and outputs. In fact, they are usually given to permit exporters to meet the lowest price competition. Therefore, it is not necessary to make the distinction between the pre-subsidy and the after-subsidy price levels in the calculation of the effective rate of subsidy, and direct use can be made of the going market prices for $P_{dij}$, $P_{wij}$ as well as for the final output.

There remains the problem of estimating the world price $P_{wij}$. One means of estimating the world price, $P_{wij}$, is to use the lowest price among the major producing or supplying countries. However, this will bias the effective rate of subsidy downwards since $P_{dij}$, the domestic price, will always be greater than $P_{wij}$ except for the countries who enjoy the lowest price. To avoid this bias, an alternative is to take the overall average price of the major producing or supplying countries to represent the world price. While an average of this type has obvious imperfections, it will, nevertheless, reveal significant fluctuations occurring in the trend of world prices.

Besides, inputs do not always come from the cheapest sources due to various reasons including adherence to traditional suppliers, lack of knowledge, and the existence of government policies and marketing institutions. Therefore, it is reasonable to assume that as an alternative to domestic sources, inputs can be acquired in the world market at the overall average price of the major producing or supplying countries.

# CHAPTER 5

## THE EFFECTIVE RATES OF SUBSIDY ON THE U.S., CANADIAN AND THE E.E.C. EXPORTS OF FLOUR

To examine the effect of export subsidies on the CFMI, the effective rates of subsidy on Canadian flour exports are calculated. The effective rates of subsidy on the U.S. and the E.E.C. flour exports are also calculated so as to provide comparisons of the magnitude of the effectiveness of the subsidies in the respective countries.

Table 12 gives the nominal subsidy rates, $S_j$, on flour exports by the U.S., Canada and the E.E.C. For Canada, the Export Flour Adjustment has been suspended since 1964 and therefore since then Canada has no subsidy on flour exports.

For the U.S., the term "export payment" includes export payments in cash (or in kind for some prior years) made directly to exporters. It also includes the "export differential" which refers to the difference between the U.S. domestic market price and the Commodity Credit Corporation (CCC) sales price for commodities sold for export from government owned stocks at competitive world prices.

For the E.E.C., the Restitution Payments to the eight different zones are averaged monthly. The crop year average Restitution Payments are the average of these monthly figures. Data on the E.E.C. Restitution Payments prior to 1967/68 are not available. Therefore, the calculation of the effective rates of subsidy on the E.E.C. exports

TABLE 12

THE U.S. EXPORT PAYMENTS ON FLOUR,
THE CANADIAN EXPORT FLOUR ADJUSTMENTS,
(1960/61 to 1969/70) AND THE E.E.C.
RESTITUTION PAYMENTS ON FLOUR (1967/68 to 1969/70)

| | United States | | | Canada | | |
|---|---|---|---|---|---|---|
| | Export Payments Average/bushel in $ | Price of Flour $/bushel | Nominal Rate of Subsidy % | Export Flour Adjustment Average/bushel in $ | Price of Flour $/bushel | Nominal Rate of Subsidy % |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| 1960-61 | .78 | 2.47[a] | 32 | .07 | 2.27[a] | 04.40 |
| 1961-62 | .79 | 2.42[a] | 33 | .06 | 2.41[a] | 03.30 |
| 1962-63 | .86 | 2.38 | 36 | .08 | 2.56 | 02.34 |
| 1963-64 | .74 | 2.35 | 31 | .10 | 2.48 | 02.82 |
| 1964-65 | .34 | 2.18 | 16 | 0 | b | 0 |
| 1965-66 | .60 | 1.89 | 31 | 0 | b | 0 |
| 1966-67 | .38 | 2.08 | 18 | 0 | b | 0 |
| 1967-68 | .24 | 1.99 | 12 | 0 | b | 0 |
| 1968-69 | .13 | 2.05 | 06 | 0 | b | 0 |
| 1969-70 | .20 | 2.09 | 10 | 0 | b | 0 |

[a]Data compiled from United Nations, Commodity Trade Statistics (New York, N.Y.: Publishing Service, United Nations, annual).

[b]Data not required.

Source:
Column 1: U.S. Department of Agriculture, Economic Research Service, Foreign Agricultural Trade of the United States (Washington, D.C.: Economic Research Service, U.S. Department of Agriculture, April, 1971).

TABLE 12 CONTINUED

| | E.E.C. | | |
|---|---|---|---|
| | Restitution Payments Average/M.T. in $ | Price of Flour $/M.T. | Nominal Rate of Subsidy % |
| | (7) | (8) | (9) |
| 1967-68 | 79.07 | 74.16 | 106.62 |
| 1968-69 | 83.26 | 72.96 | 114.12 |
| 1969-70 | 86.01 | 77.30 | 111.27 |

Columns 2 and 5: International Wheat Council, World Wheat Statistics 1971 (London: Bradley & Son Ltd., 1971).

Column 3: Col. (1) divided by Col. (2).

Column 4: The Canadian Wheat Board, Annual Report ([Winnipeg, Manitoba] : [n.n.], annual).

Column 6: Col. (4) divided by Col. (5).

Column 7: Journal Officiel Des Communantes Europeennes, Legislation Office Des Publications Officicielles Des Communantes Europeennes, Luxembourg.

Column 8: Food and Agriculture Organization, Trade Year Book (Rome: F.A.O., annual).

Column 9: Column (7) divided by Column (8).

of flour is limited to the period from 1967/68 to 1969/70.

The major input of the flour milling industry is wheat. To simplify the calculation, we assume that wheat is the only intermediate input, $A_{ij}$. Returns to all other minor inputs are considered as returns to primary resources, that is, value added. Table 13 shows that on the average about 69 percent by value of the total flour shipments has been represented by wheat used in production. Therefore, we take the $\Sigma A_{ij}$ to be 0.69 for the U.S., the E.E.C. as well as Canada, assuming all these countries have the same or a similar production function.

The world, the U.S., the E.E.C. and the Canadian prices of wheat are shown in Table 14. These prices are averages of the prices of the representative grades of the respective countries. The world prices of wheat are the averages of the prices of the representative grades of the U.S., Australia, the E.E.C., Argentine and Canada. In other words, they are the average prices of the major wheat producers in the world. The Canadian prices were, on the average, 10 percent above world price levels. This reflects the quality premium enjoyed by Canadian wheat. However, changes in baking techniques have reduced the demand for such "strong" flour from the premium quality of Canadian wheat.

With the above data and the previously mentioned assumptions, we can calculate the effective rates of subsidy for the flour milling industries of the U.S., the E.E.C. and Canada using the working formula derived in Chapter 4. The results are shown in Table 15.

TABLE 13

VALUE OF WHEAT USED AS PROPORTION OF THE VALUE OF CANADIAN SHIPMENTS OF FLOUR (IN '$000)

| | VALUE OF WHEAT | VALUE OF SHIPMENTS OF FLOUR | RATIO |
|---|---|---|---|
| 1961 | 143,561 | 220,587 | .65 |
| 1962 | 159,817 | 234,255 | .68 |
| 1963 | 163,998 | 235,603 | .70 |
| 1964 | 207,438 | 295,056 | .70 |
| 1965 | 168,935 | 244,483 | .69 |
| 1966 | 178,590 | 263,689 | .68 |
| 1967 | 174,201 | 248,411 | .70 |
| 1968 | 158,581 | 227,666 | .69 |
| 1969 | 164,569 | 241,244 | .68 |

Source:

Dominion Bureau of Statistics, Manufacturing and Primary Industries Division, Flour Mills (Ottawa, Ontario: Information Canada, annual). (Information for future years will be included in Cat. No. 32-228, Flour and Breakfast Cereal Products Industry.)

TABLE 14

THE WORLD, THE U.S. AND THE CANADIAN

WHEAT PRICES (U.S. $/BU.)

| | WORLD* | U.S. | U.S./WORLD | CANADA | CANADA/WORLD | E.E.C. | E.E.C./WORLD |
|---|---|---|---|---|---|---|---|
| 1960-61 | 1.62 | 1.63 | 1.01 | 1.75 | 1.08 | 1.50 | 0.93 |
| 1961-62 | 1.90 | 1.66 | 0.87 | 2.11 | 1.11 | 1.72 | 0.91 |
| 1962-63 | 1.72 | 1.74 | 1.01 | 1.95 | 1.13 | 1.55 | 0.90 |
| 1963-64 | 1.78 | 1.78 | 1.00 | 1.98 | 1.11 | 1.61 | 0.90 |
| 1964-65 | 1.68 | 1.71 | 1.02 | 1.83 | 1.09 | 1.70 | 1.01 |
| 1965-66 | 1.66 | 1.63 | 0.98 | 1.83 | 1.10 | 1.69 | 1.02 |
| 1966-67 | 1.80 | 1.79 | 0.99 | 1.98 | 1.10 | 1.80 | 1.00 |
| 1967-68 | 1.64 | 1.66 | 1.01 | 1.85 | 1.13 | 1.47 | 0.90 |
| 1968-69 | 1.75 | 1.69 | 0.97 | 1.89 | 1.08 | 1.66 | 0.95 |
| 1969-70 | 1.61 | 1.53 | 0.95 | 1.73 | 1.07 | 1.74 | 1.08 |

*The world price is the average of the representative grades of the U.S., Australia, EEC, Argentina and Canada prices, listed in the International Wheat Council, Review of the World Wheat Situation (London: Bradley & Son Ltd., annual).

Source:

International Wheat Council, Review of the World Wheat Situation 1965/66 and 1970/71 (London: Bradley & Son Ltd., annual).

TABLE 15

NOMINAL AND EFFECTIVE RATES OF SUBSIDY ON FLOUR OF THE U.S., CANADA AND THE E.E.C.

| | UNITED STATES | | CANADA | | E.E.C. | |
|---|---|---|---|---|---|---|
| | NOMINAL RATE | EFFECTIVE RATE | NOMINAL RATE | EFFECTIVE RATE | NOMINAL RATE | EFFECTIVE RATE |
| 1960-61 | .32 | 1.01 | .044 | -.035 | | |
| 1961-62 | .33 | 1.35 | .033 | -.138 | | |
| 1962-63 | .36 | 1.139 | .0234 | -.2139 | | |
| 1963-64 | .31 | 1.0 | .0282 | -.1539 | | |
| 1964-65 | .16 | .4716 | 0 | -.2004 | | |
| 1965-66 | .31 | 1.0445 | 0 | -.2226 | | |
| 1966-67 | .18 | .6029 | 0 | -.2226 | | |
| 1967-68 | .12 | .3648 | 0 | -.2894 | 1.07 | 3.4416 |
| 1968-69 | .06 | .2603 | 0 | -.2071 | 1.14 | 3.6824 |
| 1969-70 | .10 | .433 | 0 | -.1559 | 1.11 | 3.5876 |

The effective rates of subsidy on exports of flour by Canada have been consistently negative from 1960/61 to 1969/70, despite the fact that there were subsidies in the form of the Export Flour Adjustments[1] during the period 1960/61 to 1963/64. This result derives from the Canadian wheat price which exceeds the world price level used in the calculation. (Quality and transportation explain part of the difference in price, but probably not all). This disadvantage on input price offsets the export subsidy, so that the higher price paid for wheat by Canadian millers than by world competitors as a whole kept the effective rates of subsidy negative.

The effective rates of subsidy of the flour milling industry in the U.S. are just the opposite and have been positive, fluctuating from 1.35 in 1961/62 to 0.2603 in 1968/69, throughout the period discussed. These effective rates are always larger than the nominal rates. This is due to the fact that $D_i$, the ratio of the U.S. to the world wheat price, is always less than the nominal subsidy rates. Therefore, as has been proven earlier, $g_j$, the effective rate of subsidy will be greater than $S_j$, the nominal subsidy rate, when $S_j$ is greater than $D_i$.

For the E.E.C., the effective rates of subsidy are much higher than the nominal subsidy rates. This is the result of the availability of cheaper wheat supply to the E.E.C. millers. In fact, in the three year period, from 1967/68 to 1969/70, the effective rates of subsidy have been consistently over 300 percent. Rates of this

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[1]The Export Flour Adjustment was introduced on March 1, 1957 and was suspended on June 22, 1964.

magnitude readily explain the ability of the E.E.C. to capture a larger share of the world flour market and emerge as the biggest exporter of flour.

The results in Table 15, lend quantitative confirmation to the claim that export subsidies on flour by major competitors have constituted a primary cause for Canada's declining share of the world flour market.

However, the concept of effective subsidy does not imply that the intricacy of the nominal subsidy rate can be ignored. In fact, the effective rate of subsidy is highly dependent upon the magnitude of the nominal subsidy rate. Therefore, the nominal subsidy rate should be given equal attention.

The estimation of the annual nominal subsidy rate on flour exports by the U.S., Canada and the E.E.C. in Table 12 has obvious imperfection due to extensive aggregation. This is particularly true in respect of the rates for the E.E.C. which provides different levels of subsidy to each of eight designated zones. The simple average of the annual subsidies on flour exports to these eight zones by the E.E.C. does not represent perfectly the annual subsidy on flour exports by the E.E.C. Perhaps, a weighted average according to the quantities of flour exported to each of the eight zones would provide a better representation of the annual subsidy on flour exports by the E.E.C. However, for the purpose of facilitating the exposition of the concept of effective subsidy and the calculation of the effective rate of subsidy for this study, the simple average is sufficient and is, therefore, used despite of its imperfection. An advantage of the

simple average in addition to its simplicity is that it reveals changes in intentional subsidy rates whereas the weighted average may obscure the actual rates because of shifts in volumes going to the different zones.

The estimation of the annual price of flour in Table 12 also presents a problem. Wheat flour, like wheat, is not a uniform and homogeneous commodity. The quality characteristics of different types of wheat (hard, medium-hard, soft, durum) are variable; so are the milling processes by which successive stages of refinement differentiate the grades of flour. The different grades of flour will have different prices. Therefore, to derive the annual price for flour in general is not an easy task. Again, for the sake of simplicity, the present study takes the simple average of the prices of the representative grades published by the International Wheat Council to represent the annual price of flour in general. Such a simple average, of course, is not a perfect proxy for the annual price of flour. Nevertheless, it does reveal the trend of the prices of the representative grades.

In applying the working formula to calculate the effective rate of subsidy on flour in the U.S., Canada and the E.E.C., it is assumed that wheat, within a country, is homogeneous in the production of flour and it is the only intermediate input in the process. These assumptions can be justified because wheat has consistently constituted about 69 percent of the production cost for Canadian flour in the past decade. Other costs such as additives, bags, colouring are not very significant. The costs of labour and fuel are returns to primary

resources and hence are considered as value added to the product rather than as intermediate inputs. Wheat is assumed to be homogeneous within a country in the production of flour because the extraction rates for different grades of wheat within a country do not differ substantially. In fact, it is usual practice that different grades of wheat are blended together to yield a particular grade of flour. Therefore, the non-homogeneity of wheat within a country can be ignored.

However, the characteristics and quality of different kinds of wheat among countries do pose a problem. Perhaps, some kind of quality index can be developed to take care of this problem. In fact, the E.E.C. has developed such a kind of index--Grain Quality Coefficients, used for the calculation of the daily levies. However, such Grain Quality Coefficients, even if they ideally reflected quality variations, would not readily lend themselves to a resolution of the difficulties in accounting for grain quality in a study of this nature. The development or refinement of a quality index is beyond the scope of this study. Therefore, the presence of different quality of wheat among countries is not incorporated in the model. Nevertheless, the existence of this problem should be recognized in the interpretation of results.

Transportation cost is another problematic area where economists have failed to find a satisfactory solution in the analysis of international trade issues of the type concerning this study. Indeed, the rapid appearance of new modes of ocean transportation, such as the container, the 100,000-ton-and-over cargo vessel and the various

"lash" (lighter-aboard-ship) systems, suggest that there may be substantial long-run changes in ocean freight rates and methods.[2] The extreme complexities in current rate structures and transportation networks precludes a proper incorporation of ocean transportation in this study. Because transportation cost is beyond the scope of this study, it is therefore ignored here. But, it should be borne in mind that transportation can pose intricate ramifications not considered in the present investigation.

Therefore, there are some limitations to the effective rates of subsidy shown in Table 15. No account is taken of the different qualities of wheat and flour among the U.S., Canada and the E.E.C. Direct use is made of f.o.b. prices to represent $P_{dij}$ without adjustment for transportation costs because flour producers are here assumed to pay the f.o.b. prices for the wheat they mill for export. This procedure may not reveal the true picture of the distortions, $D_i$. Similarly, the results are applicable only to the export market, and then only in an aggregated sense. It is appropriate to recall that the present application of the effective subsidy concept is limited to the export market. To calculate the effective subsidy on the domestic market, different $P_{dij}$, say the domestic wholesale price of wheat, would have

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[2] Information is based on Canada Grain Council, The Market For Canadian Grains in the European Community and the United Kingdom, Mission Report, Winnipeg: October, 1971, p. 77.

to be used. For the effective subsidy of the flour milling industry in foreign countries, the c.i.f. prices of wheat are better representation for the $P_{dij}$ when the countries have to import wheat. Different limitations may exist for the three calculations of the effective rate of subsidy--domestic market, millers operating in foreign countries, and domestic millers exporting.

# CHAPTER 6

## FURTHER APPLICATIONS OF THE EFFECTIVE RATES OF SUBSIDY

The effective rates of subsidy as shown in Table 15 provide a picture of the different magnitudes of subsidy on flour exports by the U.S., Canada and the E.E.C. In addition to providing this dimension, the effective rates of subsidy on a commodity can also help explain the export performance of an exporting country. This is discussed with specific reference to flour exports in section A of this chapter. In section B, a formula of estimating the amount of subsidy needed for various hypothetical conditions to be met is derived and applied to the CFMI. In section C, a simple model is built to provide a means to compare direct and indirect subsidization of the CFMI.

### A. The Effective Rates of Subsidy and Export Performance

To see how the exports of flour are affected by the effective rates of subsidy, linear regressions, using the least squares technique, are performed on U.S. and Canadian data comprising a time series of 10 years. The quantity of exports in thousands of metric tons is treated as a function of the effective rates of subsidy and the trend variable. In the Canadian case, a dummy variable is also used to represent the effect of the existence of the Export Flour Adjustment in the first four years of the ten year series.

The hypotheses on the signs of the regression coefficients are that the trend variable will be negative while the dummy variable and the effective rate of subsidy will be positive. The negative sign of

the trend variable shows that there is a decreasing trend of flour exports. The positive sign of the coefficient for the effective rate of subsidy indicates that exports of flour will increase with increase in the effective rates of subsidy. Similarly, the positive sign of the dummy variable indicates that the Canadian exports of flour will increase if there is a subsidy.

Let Ex = Exports of flour in thousand metric tons

ERS = The effective rates of subsidy

T = The trend variable

and D = The dummy variable

The results are as follows:

For the U.S.

$$Ex = \underset{(5.8916)}{2378.7178} + \underset{(1.6253)}{530.9683}\ ERS - \underset{(2.6392)}{108.7624}\ T$$

The figures in brackets are student-t values.

The multiple $R^2 = 0.8858$

The F-ratio = 27.1459

The Durbin-Watson d statistics = 1.5347

The standard error of estimate = 207.8591

The regression coefficients are significant at 10 percent level. The multiple $R^2$ is significant at 1 percent level. This indicates that there is a correlation between the exports of flour and the effective rates of subsidy. The signs of the regression coefficients are as expected. There is a decreasing trend of U.S. flour exports of

approximately 108 thousand metric tons a year. However, the export of U.S. flour will increase with increases in the effective rates of subsidy, at the approximate rate of 530 thousand metric tons per unit increase in the effective rate. At the average level of U.S. exports, over the period, this result suggests that the "average" effective rate of .7676 has enabled an increase of 18.62% in U.S. flour exports.

For Canada

$$\underset{}{Ex} = \underset{}{1006.4267} + \underset{(1.8939)}{573.7721}\ ERS + \underset{(0.3511)}{121.6363}D - \underset{(0.3636)}{9.5957}T - \underset{(0.1727)}{}$$

The figures in brackets are student-t values.

The multiple $R^2 = 0.2335$

The F-ratio = 0.6092

The Durbin-Watson d statistics = 1.8206

The standard error of estimate = 260.5349

The regression coefficients and the multiple $R^2$ are not statistically significant. However, the signs of the coefficients are as expected. There is a decreasing trend of Canadian flour exports of about 9 thousand metric tons a year. However, with one unit increase in the effective rate of subsidy, exports of Canadian flour can be increased by approximately 573 thousand metric tons. In addition, the existence of subsidy will increase the exports of Canadian flour by about 121 thousand metric tons.

While the Canadian coefficient for ERS lacks statistical significance, the similarity of its size with that for the U.S., should

be noted. Both countries appear to benefit by approximately 500 thousand metric tons from a unit increase in the effective rate of subsidy.

The question arises why the regression coefficients and the multiple $R^2$ are not statistically significant in the Canadian case. The reason is, perhaps, that Canada has not been aggressively subsidizing the exports of flour. Therefore, Canada's exports of flour are actually dependent upon the levels of subsidization on flour exports by major competitors. Canada has been in the passive or residual position.

Based on the assumption that Canada has been in the passive or residual position, the export of Canadian flour is then treated as a function of the effective rates of subsidy of Canada, the effective rates of subsidy of the U.S.,[1] the trend variable and the dummy variable. The multiple $R^2$ and the regression coefficients are also not statistically significant. The multiple $R^2$ has been improved from 0.2335 to 0.2612. The reason for such a small multiple $R^2$ is, perhaps, that Canada's flour exports are influenced not only by the U.S. but also by other competitors such as the E.E.C. Due to the lack of data, further analysis in this direction is not carried out.

B. Estimation of the Amount of Subsidy Needed

It will be very helpful to policy makers if the amount of subsidy to make the exports of the CFMI competitive in the world

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[1]The U.S. effective rates of subsidy on flour are subtracted from 0 to reflect their opposite effects on Canadian exports of flour.

market can be estimated. The calculations of the effective rates of subsidy on flour exports of the CFMI and other major competitors provide a means to estimate the magnitude of the subsidy required. From the formula

$$g_j = \frac{S_j - \sum_{i=1}^{n} A_{ij} D_i}{1 - \sum_{i=1}^{n} A_{ij}}$$ in Chapter 4 for

calculating the effective rates of subsidy, we can derive that

$$S_j = (g_j)\ (1 - \sum_{i=1}^{n} A_{ij}) + \sum_{i=1}^{n} A_{ij} D_i$$

If the level of $g_j$, the effective rate of subsidy, is determined, the nominal rate of subsidy, $S_j$, can be calculated. In other words, once the level of effective subsidy is decided, we can estimate the amount of subsidy required by calculating the nominal subsidy rate. For example, in Chapter 5, the effective rates of subsidy on the exports of Canadian flour have been shown to be negative. If it is decided that the CFMI should enjoy an effective rate of subsidy equal to zero, that is, a subsidy should be given to just cover the higher wheat prices in Canada, then the nominal subsidy rate would be

$$S_j = (0.69)\ (D_i)$$

The calculations of the nominal subsidy rates which yield an effective rate of subsidy equal to zero have been done for the period from 1960/61 to 1969/70 and the results are shown in Table 16. The nominal subsidy rates required in this case fluctuate from 0.0483

TABLE 16

NOMINAL SUBSIDY RATES REQUIRED FOR CANADIAN FLOUR EXPORT GIVEN TWO DESIRED LEVELS OF EFFECTIVE RATE OF SUBSIDY

| YEAR | EFFECTIVE RATE OF SUBSIDY EQUAL TO 0 | EFFECTIVE RATE OF SUBSIDY EQUAL TO THE U.S. EFFECTIVE RATE OF SUBSIDY |
|---|---|---|
| 1960/61 | 0.0552 | 0.3683 |
| 1961/62 | 0.0759 | 0.4944 |
| 1962/63 | 0.0897 | 0.4427 |
| 1963/64 | 0.0759 | 0.3859 |
| 1964/65 | 0.0621 | 0.2082 |
| 1965/66 | 0.0690 | 0.3927 |
| 1966/67 | 0.0690 | 0.2558 |
| 1967/68 | 0.0897 | 0.2027 |
| 1968/69 | 0.0552 | 0.1358 |
| 1969/70 | 0.0483 | 0.1825 |
| Average | 0.0689 | 0.3069 |
| Average of last 5 years | 0.0662 | 0.2339 |

to 0.0897 during this period with an annual average equal to 0.0689.

However, if it is decided that the CFMI should be subsidized to the level such that the effective rates of subsidy on the flour exports of the U.S. and the CFMI are equal, then the nominal subsidy rate will be

$$S_j = g_{j(U.S.)} \quad (0.31) + (0.69) \quad (D_i)$$

The results of the calculations of the nominal subsidy rate which yield an effective rate of subsidy equal to that of the U.S. for the period from 1960/61 to 1969/70 are shown in Table 16. In this case, the subsidy is designed not only to compensate the CFMI for the higher prices of Canadian wheat it has to use but also to align the CFMI with the U.S. milling industry which enjoys a higher rate of subsidy. The average effective rate of subsidy of the U.S. exports of flour is 0.766 over the 10 year period under discussion. Therefore, the subsidies required in this case would be much higher than those in the previous case where the effective rate of subsidy equals zero. The nominal subsidy rates which are required to yield an effective rate of subsidy equal to the U.S. effective rate range from 0.1358 to 0.4944 with an annual average equal to 0.3069 in the period discussed.

For the period from 1966 to 1970, the average annual value of the exports of Canadian flour was around $59 millions.[2] For the

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[2]This figure is computed from the Food and Agricultural Organization, Trade Year Book, (Rome: F.A.O.; Annual).

same period the average annual nominal subsidy rates which yield effective rates of subsidy of zero and the U.S. rate should have been 0.0662 and 0.2339 respectively (Table 16). Therefore, in the period from 1966 to 1970 the average total amount of subsidy required annually to compensate the CFMI for the higher wheat prices it has to pay would be about 0.0662 X $59 million = $3.9 million. To make the CFMI more competitive in the world flour market and provide it with the same effective rate of subsidy as the U.S. millers have, the average annual total amount of subsidy required would be about 0.2339 X $59 million = $13.8 million.

By using the above simple calculations and some forecast of the competitors' actions, policy makers would have a rough estimate of the size of the subsidy needed to make the export of flour more competitive.

However, it must be noted that the above calculations are ex-post analyses. The analyses are static in the sense that retaliation by competitors is not considered simultaneously. Furthermore, because Canadian export levels may be greater with subsidization, the required subsidies of $3.9 million and $13.8 million to bring the effective rates of subsidy to the desired levels could be underestimated.

C. Comparison Between the Direct and Indirect Subsidy

Economists are interested not only in the estimation of the amount of subsidy required but also in the choice of the best among possible alternatives of employing such subsidy. To rectify or to alleviate the predicament of the CFMI, four broad alternatives have

been suggested:

1. The direct subsidization of the Canadian flour exports.
2. The development of new ways of utilizing Canadian flour.
3. The establishment of flour mills by the CFMI in the less developed countries.
4. The establishment of a bakery industry which utilizes Canadian flour in the less developed countries.

The first alternative is not commendable because it is only a stopgap measure. Retaliation by major competitors can always offset the effect of such subsidy. In addition, it has been recognized as in the United Nations Conference on Trade and Development (UNCTAD), that subsidization on exports of primary products by the developed countries hinders the development of the developing countries.[3] Therefore, the payment of a direct export subsidy on Canadian flour is discouraged. In fact, on June 22, 1964 the Canadian Wheat Board terminated the Flour Export Adjustments which had been in operation since 1957. This subsidy was designed to offset the higher subsidization of flour than wheat exports by competitors.

The second alternative would probably shift the problem to other food industries. Indeed, there is a limit to the amount of food the human stomach can take. Initial development of new processes would naturally tend to focus on the domestic market. In a developed

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[3]Report by the Secretary-General of the UNCTAD, Towards a New Trade Policy for Development, New York, 1964.

country, like Canada, an increase in the consumption of flour will result in a decrease in other food intake. The problem would be shifted to other food industries. Economic payoff to this alternative in foreign markets would be subject to considerable uncertainties if not constrains as well.

The last two alternatives dealing with processing facilities in less developed countries claim the greatest realism because of rising demand for food in these countries. The desire of these countries for local flour mills to foster industrialization, to make available valuable by-products, and the precedents already set by the U.S., Canada's major competitor in this field, suggest some potential for these alternatives may exist.

However, the establishment of flour mills by the CFMI in the less developed countries will contribute little to other parts of the Canadian economy unless these mills use Canadian grain. Wheat requirements approximate 1.38 the volume of flour produced. This ratio shows the scope in supplying newly constructed or acquired mills with Canadian grain to boost Canadian grain sales and hence the economy of the Prairies.

Similarly, if the establishment of a bakery industry in the less developed countries is tied to the use of Canadian flour, it would increase the demand for Canadian flour and hence would improve the export performance of the CFMI.

However, Government assistance is needed to realize these two alternatives because of the reluctance of private firms to invest in less developed countries due to the political, social and economic

instability often present in these countries. The type of assistance considered appropriate may have to include several forms of business incentives such as grants, low interest loans, investment guarantees, tariff concessions and tax incentives. Above all, a major form of Government assistance to private investors is that of fostering a favourable climate for investment in these countries by means of maintaining diplomatic missions. Canada does have an advantage in creating and fostering such a favourable investment climate because she possesses the image of an intermediate power which usually presents a fairly moderate stand on most of the political issues on the international scene.

The magnitude in money terms of the Government assistance required for achieving objectives related to the above alternatives can be estimated by summing the expenses and/or loss of revenue in the several forms of business incentives given to the private investors. Of course, the Government's indirect assistance to private firms through politics cannot be quantified and, therefore, would not be included in the above figure.

By comparing the amount of assistance with the amount of direct export subsidy estimated by the concept of effective subsidy, policy-makers will gain perspective on the costs of the different alternatives. Therefore, the effective rate of subsidy can assist in the assessment and achievement of rational policy measures.

An example can perhaps best demonstrate how the comparison between the direct export subsidy and the assistance in investment in

the less developed countries can be undertaken. However, it must be noted that the model built here is a static one. Price fluctuations and competitors' reactions are not dealt with simultaneously.

Suppose the CFMI is to construct a new flour mill in a particular developing country X which has a large market potential for flour. The per unit price of flour (PF) must be higher than the per unit cost of producing the flour $(\frac{PC}{F})$ in that country if the construction of such a mill is to be profitable.

Let the production cost of the new flour mill be estimated by

$$\frac{PC}{F} = \frac{1}{F} \quad (N + C + PW.W + TR + MM - BP - A)$$

where PC is the production cost of flour (net of by-product value).

F is the number of units of flour produced per period of time.

N is the labour cost per period of time, based on the wages in the country X.

C is the capital cost (construction and operation) per period of time, based on local prices.

PW is the price of wheat at Canadian seaboard.

W is the quantity of wheat purchased from Canada.

TR is the transportation cost of wheat from Canadian seaboard to mill location.

MM is the margin for returns to management.

BP is the value of by-products.

A is the Government assistance in the form of business incentives.

In making the comparison between the price of flour, PF, and the production cost of flour, $\frac{PC}{F}$, alternative levels of Government assistance, A, can be included. The level of A of greatest policy relevance is that which makes $\frac{PC}{F} = PF$. That level of A can be compared to the alternative of the direct export subsidy calculated as previously shown on the basis of the effective rate that meets competitors' rates. By this means, policymakers are able to select the least-cost way of assisting the CFMI and of increasing wheat sales.

A variant of this approach is first to calculate the level of $S_j$ that places the CFMI on a competitive basis with other suppliers and then to insert this value for A in the above equation. If the resulting $\frac{PC}{F}$ is above the local price of flour in the given foreign market, then mill construction or purchase is concluded to be unprofitable. If $\frac{PC}{F}$ is less than the flour price, it may be possible for A to be reduced below the equivalent of $S_j$ and still have a viable processing facility.

# CHAPTER 7

## SUMMARY AND CONCLUSION

The present study serves two main purposes. The first is to give a survey of world trade in flour and the CFMI. Secondly, it is directed towards an enquiry of the effectiveness of export subsidy.

The structure of world trade in flour has changed substantially during the last two decades. On the export side, the E.E.C. has emerged as the biggest exporter of flour, supplanting the U.S. and Canada. On the import side, Asia has become the largest market for flour while Europe's importance has declined steadily.

The CFMI is vulnerable to its export performance because over 30 percent of its average annual production is exported annually. This traditionally large role for exports is perhaps one of the reasons why the Canadian Government has been reluctant to increase the burden on taxpayers to subsidize the export of flour.

Unlike the export orientated CFMI, millers in the U.S. and the E.E.C. export annually only about 10 percent and 12 percent of their average annual production of flour. The relatively large importance of the domestic market enhances the opportunity for the U.S. and the E.E.C. to provide subsidy on their flour exports.

To investigate the effectiveness of export subsidy, a formula for calculating the effective rate of subsidy is developed in Chapter 4. The formula is applied to the U.S., Canada and the E.E.C. exports of flour. The results are shown in Table 15 of Chapter 5. Canada has

negative effective rates of subsidy throughout the ten year period under discussion. On the contrary, the U.S. and the E.E.C. have positive effective rates of subsidy throughout the period discussed. Coinciding with Canada's negative effective rates of subsidy on flour is the decline of Canada's exports of flour from an annual average of over 900 thousand metric tons in the early sixties to about 600 thousand metric tons in the late sixties. The E.E.C. which enjoys the highest effective rates of subsidy on flour among the countries discussed had its exports of flour increased from 1,700 thousand metric tons in 1960/61 to 2,008 thousand metric tons in 1970/71. The U.S. has been able to maintain its average annual flour exports around 2,500 thousand metric tons in the early sixties when its effective rates of subsidy on flour are higher than those in the late sixties. In the late sixties, the U.S. average annual flour exports have been maintained around 1,600 thousand metric tons. Therefore, it is not without reason to say that export subsidy has a significant influence on the world trade in flour. Indeed, the discussion in section A of Chapter 6 has shown that there is strong correlation between the export performance and the effective rates of subsidy.

The predicament of the CFMI is revealed by the adverse rates of effective subsidy in Table 15 of Chapter 5. To alleviate the predicament of the CFMI, alternatives such as direct subsidization, development of new ways of utilizing Canadian flour, and the establishment of flour mills or bakery industry by the CFMI in the less developed countries have been suggested. However, the last alternative is considered more appropriate and desirable than the

others in terms of international welfare and development. The effective rate of subsidy provides a means for comparison between the direct subsidization on exports of flour and the indirect subsidization via the assistance in constructing or acquiring mills or bakers in the less developed countries.

In conclusion, the concept of effective subsidy serves as a new tool for analyzing export performance and provides a means to quantify the actions of major competitors. The effective rate of subsidy gives a more concrete indication of the size of subsidy required. It enables the policymakers to select the better alternative between direct subsidization and indirect subsidization. The concept of effective subsidy is not only helpful to policymakers in designing better domestic policy measures but also useful to decision-makers in international trade negotiations by supplying them with quantified information. However, the models in the present study are only in crude form. Refinements can be achieved in those areas discussed earlier in Chapter 5 by further research. It is appropriate to recall that the models developed here, with slight modification, are also applicable to other agricultural commodities and non-agricultural commodities such as textile products.

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