



Economic Council of Canada Regulation Reference
Conseil économique du Canada Mandat sur la réglementation



The Institute for Research on Public Policy
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Technical Report E/I 6
**Government Intervention and Regulation
in the Canadian Grains Industry**

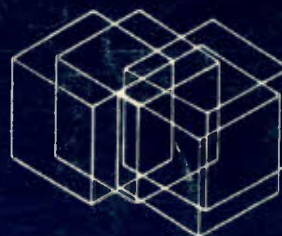
D. R. Harvey
University of Newcastle Upon Tyne

together with a
Supplementary Essay
"Regulation and the Characteristics
of the Supply of Transport to
Agriculture in Canada"
by
Fred Anderson
University of Regina



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TECHNICAL REPORT E/I 6
GOVERNMENT INTERVENTION AND REGULATION
IN THE CANADIAN GRAINS INDUSTRY

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The findings of this Technical Report are the personal responsibility of the author, and, as such, have not been endorsed by members of the Economic Council of Canada.

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Preface

This Technical Report was jointly sponsored by the Economic Council of Canada and The Institute for Research on Public Policy. It is one of a number of studies on regulation and government intervention in Canadian agriculture prepared for the Economic Council's Regulation Reference and the Institute for Research on Public Policy's Regulation and Government Intervention Program.

Analysis of public policy issues are inevitably coloured by the discussant's own beliefs and values. This is all the more likely in a highly controversial area such as agricultural policy, where quantitative information is incomplete and an important element of judgement is required to come to terms with many of the basic issues. This need not detract from the usefulness of the analysis, but it does require the reader to exercise particular caution in assessing the assumptions and the argumentation of those advocating a particular policy perspective. It also adds to the importance of the Council's usual disclaimer that "the findings ... are the personal responsibility of the author and, as such, have not been endorsed by members of the Economic Council of Canada." Similarly, "Conclusions or recommendations in The Institute's publications are solely those of the author, and should not be attributed to the Board of Directors, Council of Trustees, or contributors to The Institute."

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- R. Gordon Robertson
President
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on Public Policy

FOREWORD

This study is one of a series commissioned jointly by the Economic Council's Regulation Reference and the Institute for Research on Public Policy which deals with various aspects of agricultural regulation. These studies do not profess to cover the whole field of agricultural regulation but they do focus on several important areas of concern.

The following is a list (alphabetically by author) of agricultural studies to be published in this series:

- *Arcus, Peter L., Broilers and Eggs
- *Barichello, Richard R., The Economics of Canadian Dairy Industry Regulation
- Brinkman, George L., Farm Incomes in Canada
- Forbes, J.D., D.R. Hughes and T.K. Warley, Institutions and Influence Groups in the Canadian Food Policy Process
- Gilson, J.C., Evolution of the Hog Marketing System in Canada
- *Harvey, D.R., Government Intervention and Regulation in the Canadian Grains Industry
- *Josling, Tim, Intervention and Regulation in Canadian Agriculture: A Comparison of Costs and Benefits among Sectors
- *Martin, Larry, Economic Intervention and Regulation in the Beef and Pork Sectors
- *Prescott, D.M., The Role of Marketing Boards in the Processed Tomato and Asparagus Industries

* Already published

ACKNOWLEDGEMENTS

This working paper is written as part of a general investigation of government intervention and regulation in Canadian Agriculture, commissioned by the Economic Council in 1979, through Broadwith, Hughes and Associates, Guelph.

It owes much to many people involved in the grains industry and involved in the policy process associated with the grains industry. To those who recognise a contribution and yet fail to see specific acknowledgement, I ask forgiveness and offer sincere thanks. Their number is too great for either accurate recall or proper recognition. Special thanks are due, however, to Professor. T.K. Warley, Guelph University; Art Wilson, Canada Grains Council; Larry Rayner, Canadian Grain Commission; Harold Bjarnasson, Canadian Wheat Board; Professor F. Anderson, University of Regina; Dr. A. Ellinson, Economic Council and Professor J. Forbes, University of British Columbia, for their indulgence and comments on my thoughts. Thanks are also due to many active participants in the grain trade and to ex-colleagues in Agriculture Canada, without whom my knowledge and understanding of the Canadian grains industry would be even more limited.

That said, and apart from any original error of commission, errors, misunderstandings and omissions are the sole responsibility of the author.

Newcastle, May 1980

BIOGRAPHICAL NOTE.

The author is currently a lecturer at the University of Newcastle upon Tyne, England. Between July and September 1978 he was engaged in writing up research on the Crows Nest Pass Rate for the Centre for the Study of Inflation and Productivity, Economic Council, Ottawa (forthcoming report, The Institute for Research in Public Policy, Montreal.) Between 1973 and 1978, he was employed, first as an economist, later as Senior economist, with the Economics Branch, Research Division, Agriculture Canada, Ottawa, where he was involved, inter alia, in the analysis associated with feed grains policy and grain transportation policy.

He has a Phd (1973) and an MA (1970) in Economics from Manchester University, England and a B.Sc. Agriculture, (1969) from the University of Newcastle upon Tyne, England.

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SUPPLEMENTARY ESSAY: Regulation and the Characteristics of the Supply
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Résumé

Les céréales constituent le secteur le plus important de l'agriculture canadienne et se taillent la part du lion en ce qui concerne les recettes réalisées en devises étrangères. L'auteur décrit et analyse la Commission canadienne du blé, le système de manutention et de transport des céréales, et la Loi de stabilisation concernant le grain de l'Ouest, qui constituent les agents principaux touchant le producteur de céréales. Le système de réglementation qui s'est développé au cours du demi-siècle passé visait à assurer que les producteurs de céréales jouissent d'une égalité d'accès aux marchés de céréales où l'offre a toujours été surabondante. En raison des taux de transport par chemin de fer déterminés par la loi en 1898 et du système de réglementation actuel, la classification, le ramassage et le système de transport des céréales n'est plus en mesure, à l'heure actuelle, de satisfaire à la demande d'un marché mondial qui peut absorber la totalité des exportations potentielles canadiennes.

Le souvenir d'une situation ayant conduit à la réglementation actuelle qui a bien servi le pays par le passé, les conflits d'intérêt entre les groupes de producteurs, les provinces et le

gouvernement fédéral, et le système de manutention et de transport des céréales, sans compter les rigidités institutionnelles des organismes de réglementation et autres, donnent une forte coloration politique à tout changement et le rendent difficile à réaliser. En outre, les avantages possibles d'un changement de stratégie dans la direction de l'intervention publique concernant l'industrie des céréales sont nettement plus élevés que toute somme de changements partiels ou fragmentaires.

À notre avis, un secrétariat de l'industrie des céréales, composé de personnes influentes et bien informées reflétant les divers intérêts du secteur, serait l'organisme désigné pour évaluer les changements souhaitables et les mettre en oeuvre, et obtenir l'appui politique en vue de développer entièrement le potentiel de cette industrie.

Summary

Grains is the largest sector and provides the lion's share of foreign exchange earnings in the Canadian agricultural sector. The Canadian Wheat Board, the Grains Handling and Transportation System, and the Western Grains Stabilization Act are described and analyzed as they are the main institutions and legislatively sanctioned regulatory mechanisms affecting grain producers. The grains industry regulatory system which has evolved over the past half century was designed to ensure that grain producers had equality of access to grain markets which have historically been over-supplied. With a rail transportation rate fixed by law in 1898 and present the present system of regulation, the grading, collection and transportation system for grains is now unable to meet the demand of a world market which is able to absorb all of Canada's export potential.

Memories of a situation leading to the present regulatory situation which has served the country well in the past, conflicts of interest between producer groups, the provinces and the Federal government, and the grain handling and transportation system, coupled with the institutional rigidities of regulatory and other bodies, have made any change highly politicized and difficult to achieve. Further, potential gains to be made from a strategic change in the direction of public intervention in

the grains industry are significantly greater than the sum of partial or piece-meal changes.

A grains industry secretariat, composed of informed and influential individuals reflecting the various interests in the grains industry, is suggested as the body to objectively evaluate, generate political support for and implement needed changes to fully develop the industry's potential.

I INTRODUCTION

The objective of this study is to delineate and quantify the costs and benefits of economic intervention and regulation in the Canadian grains industry, with particular reference to marketing boards. The means available for the achievement of this rather ambitious objective are, however, strictly limited and the study must therefore be somewhat selective and restricted in its scope.

The history of the modern Canadian grains industry is very much a history of Western Canada, particularly the history of the settlement and development of the Canadian prairies. As such it is dominated by the construction and subsequent development of the rail system. This development has two major aspects: the provision of adequate rail service to aid the settlement and growth of the region as a part of a unified Canadian nation; and the control of the monopoly power of the railway companies, particularly the C.P.R.. Allied with the very real distrust of the railways' monopoly power was a similar fear about the power of private grain companies to pursue their own interests at the expense of the grain farmer.

The development of policies and institutions associated with this industry is thus primarily concerned with the transport system and with grain marketing institutions, including the Canadian Wheat Board. Thus it is natural for a study of this kind to concentrate on these issues. Furthermore such selectivity, at the expense of, for instance, the growth and development of the Ontario wheat and soybean industries, is warranted by the predominant position of grain production in prairie agriculture and by the importance of western grain exports in the agricultural trade of Canada. Outside the prairie region, the grains industry assumes a generally secondary role and is largely complimentary to other sectors of the agricultural industry, particularly animal agriculture. Separate discussion and analysis of the grains sector outside the prairies is thus both more difficult and of less use in its own right, as opposed to an adjunct to the analysis of animal agriculture.

Even within the prairie grains industry, concentration on the C.W.B. and the transportation issues mean that many other elements of the whole policy amalgam will be treated only incidentally, if at all. Policies and programs which are treated as ancillary to the major thrust of this study include crop research and development, grain grading regulation and supervision, consumer protection and subsidisation (the Two Price Wheat Act) and crop insurance.

Methodology

Rather than attempt a complete, or even partial, taxonomy of the forms of regulation and intervention in the Canadian grains industry, the approach adopted here is to concentrate on the economic consequences of the intervention and regulation activities, restricting attention primarily to those associated with the C.W.B. and with the grain handling and transportation system (the GHTS). The consequences of these activities are examined in terms of both the objectives implicitly or explicitly associated with the intervention and regulation mechanisms, and in terms of the transfers of income, risk and decision making cost between the different groups and institutions involved, and thus to the costs and benefits associated with some specific changes in the mechanisms.

To do this, the regulatory/intervention mechanisms are examined piece by piece as follows. The C.W.B. regulation complex is broken down into three parts; the marketing strategy, involving pricing and supply decisions and consequently decisions on accumulation or disposal of grain stocks; the marketing tactics, involving scheduling grain through the GHTS to meet export commitments and related activities; and the achievement of equity and stabilisation objectives through quotas and price pooling, and including, as a related element, the Western Grain Stabilisation Act. The G.H.T.S. complex is divided into essentially two parts; the regulation of rail rates via the Crows Nest Pass Rates; and the regulation of levels of service and the responsibility for the provision of appropriate capacity.

Examination of these elements on a piecemeal basis means that the conclusions that can be drawn on the transfers, costs and benefits involved in each element, compared with some specified alternative, are not necessarily additive. It seems likely that, because of the considerable interrelationships both between elements and with the underlying structure of the industry, the combined effects of several changes would be more far reaching and potentially important than the sum of the parts. As a result, it has not been possible to isolate the effect of a radical shift in regulation/intervention policy though some feel for such effects may be gleaned from the partial conclusions.

The isolation of the transfers involved in the elements of the regulation/intervention system examined in this report highlights the vested interests and consequent adjustment costs associated with any change. The costs and benefits, albeit not always quantifiable, are not restricted to those associated with comparative static analysis of economic resource allocation but attempt to include distributional and dynamical aspects. The conclusions from this exercise allow some systematic choices to be made concerning the net benefits of change and the associated political, social and economic adjustment costs or barriers to such change.

Caveats

Over and above its selectivity, it is important to note further caveats on the scope and nature of this study. The importance of these points will be amplified in the text of the report but they are sufficiently fundamental to require emphasis at the outset.

i) Identification, and still more quantification, of the costs and benefits of a particular policy requires that a specific alternative be chosen against which to compare the current policy. The most obvious alternative, the U.S. grain marketing system, needs to be treated with some caution, or at least properly specified. It will be seen that, although the marketing system south of the 49th parallel is often characterised as 'free enterprise', the U.S. grains industry has

benefitted from substantial and almost continuous taxpayer support to a significantly greater extent than has been the case until now in Canada. The geography and the climate of the U.S. versus the Canadian prairies means, too, that the variety, complexity, and resulting flexibility of the U.S. grains industry (both production and marketing systems) is likely to be considerably greater than in Canada whatever policy strategy is adopted. Put the other way round, the Canadian grains industry is constrained by a short growing season, a dry climate and its physical location relative to domestic markets and export routes, and, at least for wheat, a small domestic market relative to total production. These constraints are neither so rigid and inflexible in the States as a whole (though similarities can be found in particular regions), nor are they amenable to change through policy instruments. This means that comparisons of performance of the grains industry between Canada and the U.S. are of strictly limited value in determining what the Canadian industry might do in response to a change in policy direction. While such comparisons are practically inevitable and are referred to in this study, their major value lies in raising questions and providing evidence about the Canadian performance within the Canadian context. Even where such comparisons appear unfavourable to Canada, it is not necessarily correct to infer that Canada would or could be better off under the American system¹.

ii) The political and social acceptability of an alternative policy strategy is clearly of paramount importance when considering the likelihood of changing policies and even when recommending policy change. Its importance in the analysis of current policy, however, is of a different order. Specifically in the grains industry some concept of 'equity' or 'equality' has been a major influence on current policies and institutions. To attempt to point out the economic costs of this emphasis is not to suggest that the emphasis is misplaced - that is a matter of judgement about which economists, qua economists, have little to say. Rather, the enumeration of these costs should be used by policy

1. For a recent treatment of this issue, see McCalla and Schmitz, 1979.

makers and pressure groups in making the judgements about the desirable degree of equity to aim for. The commonly expressed view that 'equity' (as it currently exists in the grains industry) is of paramount importance as evidenced by the continued existence and strength of institutions supporting the concept may demonstrate little more than a lack of wide discussion or understanding of its effects. Any argument that a less egalitarian policy alternative is a political non-starter and therefore not worthy of further discussion seems, at least to this author, to be a contradiction in terms within an open democratic environment. Alternatives will always be politically unacceptable if they are never discussed.

The rest of the report reflects, at least implicitly, these underlying premises and is organised as follows. Section Two deals with the structural background of the industry in two parts: i) description of the major production patterns and characteristics; ii) the disposition of grain and export environment facing the grains industry. Section Three deals with the policy background including a brief history of the development of current policies and institutions, the major policy actors and the policy-making mechanism, and a discussion of possible alternative policy directions against which the current position might be judged. Section Four deals with the C.W.B., its performance and the effects its policies have on the industry, and its relationship to other government policies and programs. Section Five deals with the transportation issues and policies. The concluding section offers some recommendations and suggestions for future policy direction and strategy.

II STRUCTURAL CHARACTERISTICS OF THE CANADIAN GRAINS INDUSTRY

II.1 Introduction

This section is intended only to highlight the more important features of the Canadian grains industry as far as current policy problems and policy responses are concerned. In so doing it provides some background to current producer and marketing problems, but it does not attempt a full description and analysis of the development of the present structure and performance of the industry¹.

The section is organised as follows. II.2 deals with the salient characteristics of the broad structure of farms and of grain production, farm cash receipts and the importance of grain as a source of cash receipts, variability of receipts and the sources of variability, and the nature of costs of grain production. II.3 deals with the disposition of grain beyond the farm gate and the nature of Canada's grain export trade, including the variability of the world grain trade. II.4 briefly discusses some projections of the future development of production and trade while II.5 draws together the implications of this short survey for the formulation of policy. An appendix to the section contains the majority of the statistical tables referred to in the text.

II.2 Structural Characteristics of Grain Production

i) Distribution of Production

Grain production is concentrated in the three prairie provinces, which currently account for about 90 per cent of total Canadian grain and oilseed farm receipts (see Table II.1). With the exception of corn and

1. Such an exhaustive study is beyond the scope of this report. Valuable references are: C.F. Wilson (1978) on the historical development of the industry and C.F. Wilson (1979) on the institutional and operational detail of Canadian grain marketing.

soybeans, the predominance of the prairies in total grain and oilseed production is repeated for the individual crops. Associated with this distribution of production is the fact that grain generates a substantially higher proportion of total farm cash receipts within the prairies than elsewhere. Within the prairies, Saskatchewan farms or more exactly those in the Palliser triangle are very heavily dependent on grain receipts for their gross income (see Table II.2). Concentration on the prairies in consideration of the Canadian grains industry (reflected, too, in policy development and application) is thus entirely understandable given the regional concentration of grain production.

ii) Prairie Farm Structure

In terms of gross receipts, at least recently, prairie farms are not of a significantly different size than elsewhere in Canada. Within the prairies, as elsewhere, the range of farm size (measured by gross receipts) around the average shows a skewed distribution with the total population dominated by smaller (family?) farms. More than half the total number of census farms in 1976 grossed less than \$25,000, while substantially more than half the prairie farms derive at least 51 per cent of their gross receipts from grain (Table II.3). Owner occupation, at least to some extent, is the dominant form of land tenure, though approximately half the "commercial" farms in the prairies are involved in some form of tenancy arrangements often within families. The popular appeal of preservation of the family farm as a major farm policy objective is clear from this brief snapshot of farm structure.

Over the recent past there has been a tendency for the acreage of farms to increase in the prairies and for the number to fall (as elsewhere in Canada), though the decline in farm numbers has been offset by a significant growth in total improved acreage in the prairies which has not been typical elsewhere in Canada. As a result the proportion of all Canadian census farms located in the prairies has grown over the last two decades (Table II.4). The growth in average acreage per farm, however, does not necessarily imply any tendency for the family farm to become less important. To a large extent this change reflects an increasing substitution of capital for labour over the recent past.

iii) Variability of Gross Receipts

While grain receipts per farm have increased over the last two decades, the rate of increase has been far from constant and, especially when the effects of inflation are taken into account, grain receipts in real terms are subject to significant inter-year fluctuations. These variations may be offset to some extent by counter-balancing variations in the livestock industries, but for the prairies, and especially for specialist grain farms in the Palliser triangle, the grain receipt fluctuations are reflected directly in changes in gross farm income (see Table II.5).

Grain receipts per farm are an amalgam of price per unit, yield of grain per acre, and quantity sold (which, as will be seen, does not necessarily reflect acreage grown). Both prices and yields show significant inter-year variation, and low prices are not typically offset by high yields. In real terms (deflated by the C.P.I.), revenues per acre have shown some improvement in the 1970s over the 1960s, but the peak returns of 1973 and 1974 have not been maintained in the more recent years (see Tables II.6, II.7 and II.8). Some measures of the variability of both yields and real returns per acre are given in Table II.9, over the period since 1966/67. The standard deviations around the mean of real revenues per acre are large, some 40 per cent or so of average revenues, and the trend over the period in real revenues has not been strongly significant, though may be better for barley and rapeseed than for wheat, especially in Manitoba and Alberta. Not surprisingly, then, the variability and consequent uncertainty about returns per acre in grain production continue to attract considerable policy attention and concern from the marketing and producer organisations and institutions.

The tendency for rapeseed and barley revenues to become more competitive with wheat over the recent past (shown in Tables II.7, II.8, II.9) is reflected in the growth in rapeseed and barley averages in Western Canada, compared with a relatively static wheat acreage (Table II.10).

While there are, of course, many factors other than gross real revenues per acre which are likely to influence acreages sown and harvested, the historic trends in these have some important implications for the grain marketing system, and the performance of the latter may well in turn influence producer grain acreage decisions. Nevertheless, wheat continues to be the single most important crop, in acreage terms, with some 50-60 per cent of the total seeded acreage in most years, while summer fallow acreage is also a major crop-land use, though tending to become less important relatively as the area of improved land increases and the cropping pattern changes in favour of feed grains and oilseeds.

Apart from the effect of specific government programs, especially the Lower Inventories for Tomorrow (LIFT) program of 1970, and the apparent trends in coarse grain and oilseed acreages, there is little inter-year variation in acreages (though rapeseed acreages recently have shown considerable instability). Marketings, or sales of grain, have however shown significant variation independent of

production (acreage times yield) over the recent past. Again the relationship between sales and production obviously both has implications for and is affected by the marketing and distribution system. Apart from grains fed direct to livestock in Western Canada, which accounts for a significant part of barley production, the discrepancy between production and marketing of grain is taken up by changes in farm held stocks of grain. As shown in Table II.11, farm stocks of all major grains were rising in the 1960s and then largely liquidated in the early 1970s, preceeding the price boom of 1972/74. Following that liquidation, farm held stocks and the ratio of marketings to production have been fairly volatile for all of the grains, and furthermore show evidence of some conflict between the grains within the marketing/distribution system, with wheat marketings up when barley and rapeseed are down and vice versa implying greater emphasis and constraints on throughput through the GHTS rather than on storage. The level of farm stocks can be expected to affect production and acreage decisions, and any liquidation of stocks on the local, domestic market, will have significant impacts on local prices and thus on overall returns to grain sales.

iv) Grain Production Costs

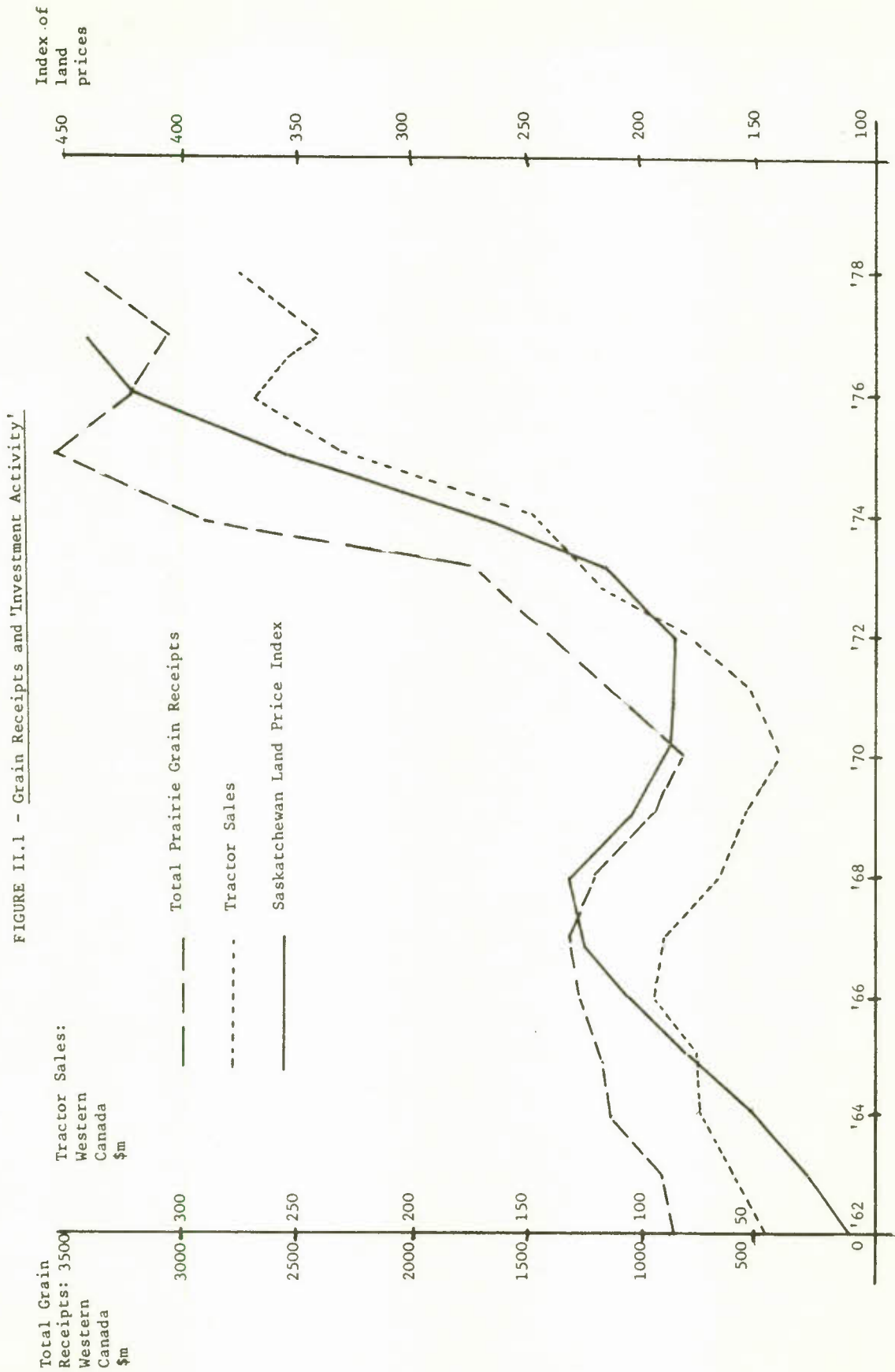
Cash expenses have been increasing through the 1970s, and when combined with gross receipts (grain proceeds) show a variability in margins per acre which are not dissimilar to the variations in real gross receipts per acre discussed above (see Table II.12). While the derivation of these figures on an aggregate average basis may give a somewhat misleading impression between years (compare these costs, for example, with those in Sorboe) more important is the fact that they conceal a good deal of variation between farms of different sizes, types, and locations, as is shown up by Sorboe and by Johnson (1978). In general, as one might expect, the small, the mixed and the highly productive farms tend to show the highest cash expenses per acre (Sorboe) with the net income consequences that the smaller farms have lower net receipts per acre and lower returns to equity capital and own labour (Johnson (1977)). In fact, given the variation shown in gross real receipts since 1971 for all grains (coefficient of variation; 0.275), small and medium farms can expect a zero return to management at least one year in seven, which explains a major part of the agitation by producers both for increased stability to income streams and some income support.

Viewed from a different perspective, even with no change in gross receipts (which vary as a result of price and yield variation) the small farmer (600 acres) can find his return to management driven to zero by relatively modest changes in interest rates, especially applicable to those in high debt/equity positions, or by modest increases in equity capital (charged an opportunity cost interest rate) through re-investing "profits" (see below). Concern over maintaining the family farm and over preserving the financial integrity and attractiveness of the business for new entrants can be understood in the light of these observations (see Table II.13).

Two further potentially important consequences follow from the variability of gross receipts and the cost structure of grain farms. The first concerns the interaction of gross receipts and the capital costs of grain production. Periods of high revenues (high prices and/or large sales) encourage the purchase of capital assets and equipment, especially land and machinery. Since this investment will increase the opportunity and cash costs associated with the capital base, this periods' high profits will tend to result in an increase in the total cost base, which is sustainable only given maintenance of the revenue stream. While future periods of low prosperity can be weathered by acceptance of low or negative rates of return on equity capital and management, such periods will be associated with pressures on the existing farm population, especially small farms, and on the prospects for new entrants. The historical relationships between gross receipts, machinery investment and land prices are adequately demonstrated in Figure II.1 and the associated Table IV.14 (see also Johnson (1978(a))).

The second point concerns the mix of grain production and the intensity of grain production. Johnson (1978(b) and 1979) has examined the relative profitability of crop rotations under various historical price relatives and reaches the conclusion that under recent and current price relatives, oilseeds (rape and flax) offer higher returns than cereal grain rotations and that the feed grains (barley) become attractive relative to wheat only when combined with oilseed crops. The "traditional" wheat summer fallow rotation continues to be relatively attractive compared with cereal rotations excluding oilseeds. The net returns to land, labour and management under a cereals only rotation, however, are currently sufficiently low to be financially unattractive for new entrants, highly capitalised farms, or farmers with alternatives to grain production open to them¹. On the other hand, Zentner et al (1978, 1979) have shown that the variability of net returns under oilseed rotations is higher than for cereal grains and that seasonal labour requirements (important for the self-contained family farm) are

1. In addition, soil and climatic differences are sufficient to change the relative attractiveness of rotation practices quite considerably between regions.



more disadvantageous under rotations other than the traditional crop-fallow rotation (for the brown soil zone at least). In general, the results of this study seem to confirm the opinion that income variability, and the consequent exposure to financial risk, encourage low intensity and relatively high summer fallow acreages. While changes in the variability of gross receipts and of net margins could alter the attractiveness of cropping program options, and thus the grain output of the prairies, so, too, can changes in agricultural policies and programs (e.g. quota allocation mechanisms, marketing strategies and tactics and so on) as Zentner et al point out. In addition, the effects of future, policy induced, changes on the level of net margins in grain production on the value of and returns to the capital asset base are likely to be important, especially when it is remembered that this asset base constitutes, in many cases, a major source of pension funds for existing farmers.

II.3 Grain Disposition, Exports and World Trade

i) Supply and Disposition

While the Canadian grains industry is predominantly export oriented, domestic utilization of grains, particularly feed grains, within Canada is nevertheless significant. In fact, some 40-50 per cent of total wheat, oats and barley supplies typically disappear domestically, and some 25 per cent of total wheat production goes to domestic uses (see Table II.15). While this report will concentrate on the performance of and constraints on the grains industry from the points of view of the producer returns and of export performance, the effects of grain supplies, and more particularly grain prices, on the domestic economy and on animal agriculture in Canada should not be forgotten¹.

At least since 1970, export levels of the major grains have reflected changes in production levels within Canada, with accumulated stocks especially of wheat being run-down rapidly in the early 1970s (see Figures II.2 and II.3). Although historically there have been occasions when Canadian grain has been deliberately withheld from the world market and stockpiled, increasing grain stocks currently reflect transportation and distribution constraints rather than deliberate marketing strategy or policy. In effect, Canadian exports are currently determined to a large extent by the excess of available supplies over domestic requirements and by the ability of the GHTS to deliver the grain to export position. Differences between the former and the latter largely account for changing stock levels within Canada, so that in this sense grain stock accumulation is currently largely "involuntary" (not deliberate).

1. The pricing mechanism for Canadian grains will be dealt with below. It can be pointed out here that, as estimated by Ellison, inclusion of the effect of grain prices on livestock and livestock product prices within Canada means that a doubling of grain prices will raise food prices by 9.3 per cent and the CPI as a whole by 2.7 per cent compared with 2.7 per cent and 0.3 per cent respectively if the grain-livestock link is ignored.

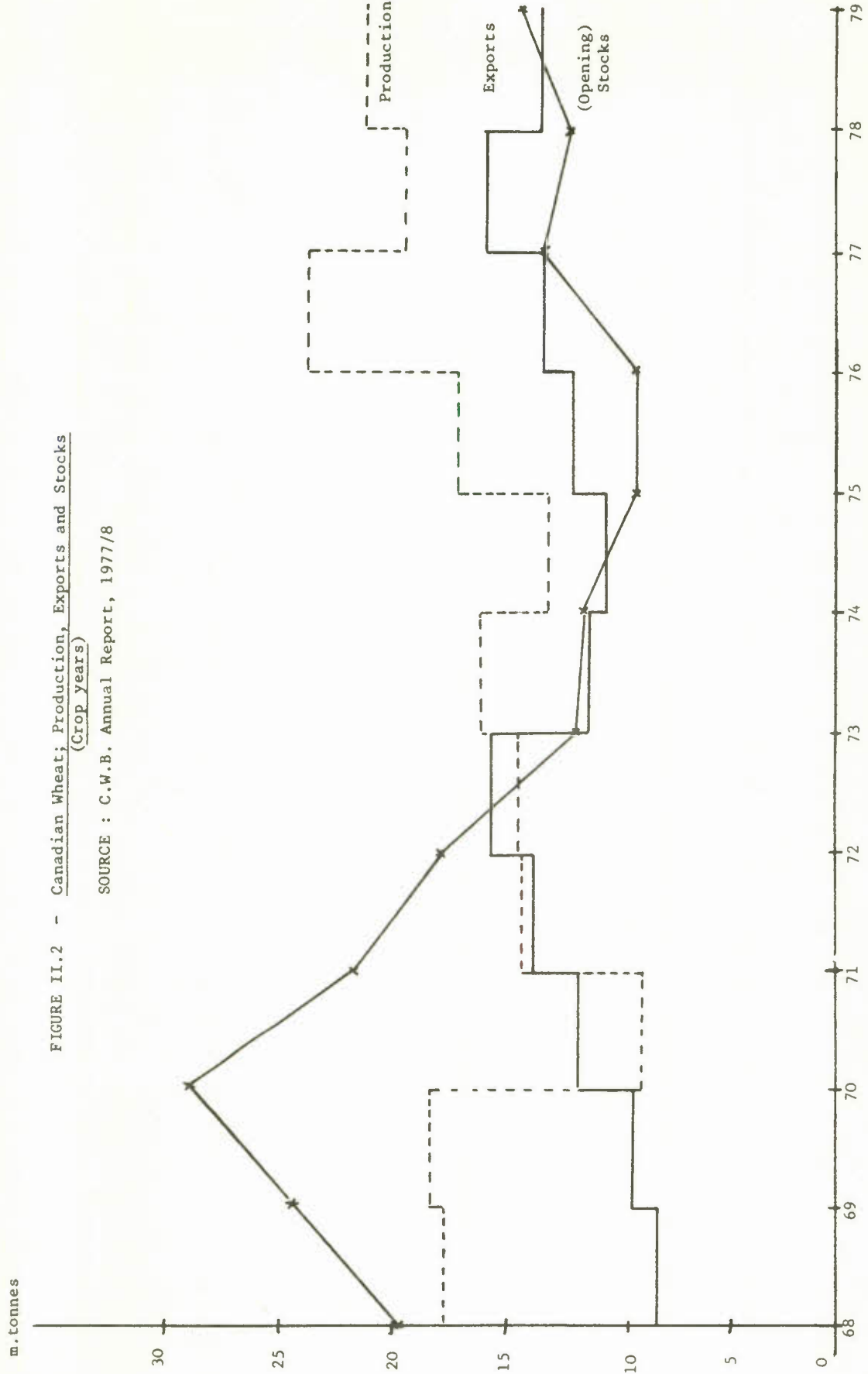
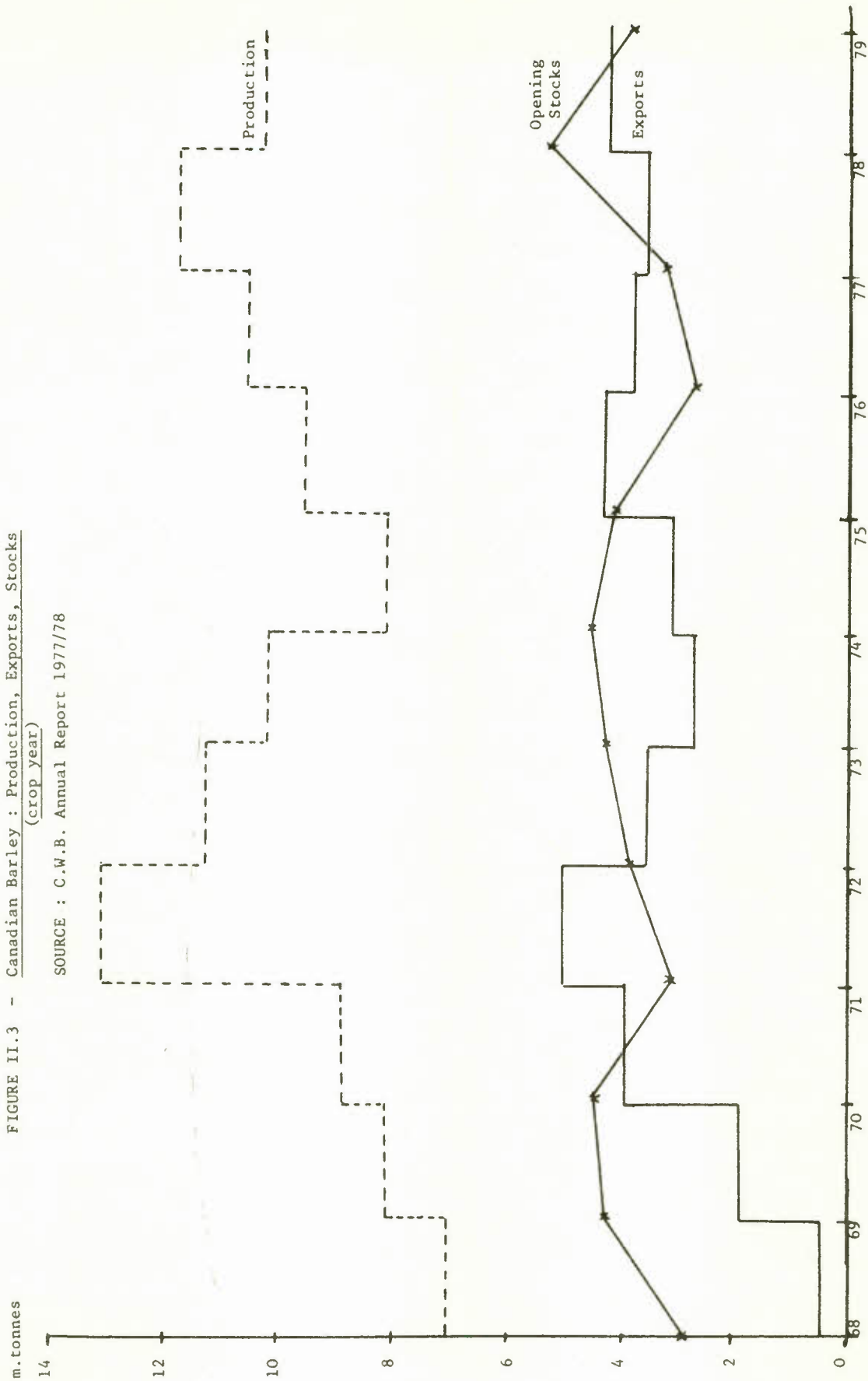


FIGURE II.3 - Canadian Barley : Production, Exports, Stocks
(crop year)

SOURCE : C.W.B. Annual Report 1977/78



ii) Canadian export shares and international disposition

Canada's share of world wheat and coarse grain trade has shown considerable fluctuation in the past (see Tables II.16 and II.17). During the 1960s, the share of the world wheat market showed signs of a serious deterioration as stocks were built up in Canada, largely to support the International Wheat Agreement of that time and because of an inability to compete with the degree of public support to the wheat industry provided by the U.S.. Coarse grain shares have tended to increase in line with a growth in the exportable surplus in Canada, albeit subject to temporary reverses imposed, more recently, by a lack of capacity in the GHTS. During the food crisis of 1973/1975 the value of grain and oilseed exports increased significantly, because of both higher prices and larger volumes. Between 1968 and 1972 grain and oilseed exports accounted for 64 per cent of agricultural exports by value and some 6.5 per cent of all exports. In 1975 these proportions had grown to 74 per cent and 9 per cent respectively but had fallen again to 70 per cent and 6.9 per cent respectively by 1977¹.

The somewhat disappointing performance in maintaining and expanding world market shares, especially for wheat, has generated some comment and criticism in the past on Canadian export marketing strategy (see, e.g. Konandreas and Hurtado, and Rigaux). The criticism typically has centred on the undue concentration of exports on traditional, highly developed and slow growing markets at the expense of the faster growing markets of the world, usually associated with lower quality wheats and feed grains. However, currently this criticism seems misplaced. Rather the share of world markets would seem to depend on the relative growth in Canada's exportable surplus compared with our major export competitors

1. Although a net exporter of grains and oilseeds, Canada also imports these products, particularly corn, oilseeds and oilseed products, into Eastern Canada. Grain and oilseed imports accounted for 13 per cent of agricultural imports between 1968 and 1972, and again in 1977, and for 18 per cent in 1975 on a total value basis.

(the U.S., Australia, Argentina and, for wheat at least, France) and compared with the growth in domestic production in traditional importing countries, and also on the ability to move this exportable surplus from the point of production into the world market. The extent to which intervention and regulation of the industry in Canada helps or hinders this performance is the main subject of this report.

iii) World grain price determination and the relationship between world prices and Canadian prices

A complete and rigorous analysis of this mechanism is beyond the scope of this report, if indeed it is possible at all. However the major elements are reasonably widely accepted¹. In elementary comparative static forms, the world price of a particular grain, say wheat, will be determined by the relationship between the excess supply of that grain from the world's exporting countries and the excess demand from the world's importers. In addition, the substitution possibilities between grains, both within human and animal feed demands and between these two major sources of demand, will tend to ensure that particular grain prices retain a reasonably stable relationship on world markets, aside from identifiable changes in tastes and utilization technology (e.g. the introduction of the Chorley Wood baking process and the relative decline in demand and price premium for hard high quality wheats, (see e.g. Wilson (1978)), or changes in utilizable quality of the product (e.g. Rapeseed, see e.g. Furtan and Nagy).

Given that the demand for Canadian grain will essentially be the difference between the excess demand and the excess supply in the rest of the world, the simple algebraic consequence is that the elasticity of this demand with respect to the world price is given as:

1. Interested readers are referred, for example, to Greenes, Johnson and Thursby; Hassan and Huff (Vol. 2); MacLaren; McCalla; Shei and Thompson (1977 and 1978), Zwart and Meilke.

$$\epsilon_{D_c} = \frac{\delta D_c}{\delta P} \cdot \frac{P}{D_c} = \frac{D_w}{D_c} \times \epsilon_{RD} - \frac{S_w}{D_c} \times \epsilon_{RS} \quad \dots\dots(1)$$

- where D_c is the level of Canadian exports, P is the world price, D_w is total consumption in the rest of the world, S_w is total supply in the rest of the world, and ϵ_{RD} and ϵ_{RS} are, respectively, the elasticities of total world demand and total world supply with respect to world price.

The size of this elasticity, or more importantly its inverse as the degree to which world prices will be influenced by any change in the level of Canadian exports, has been the subject of considerable debate (see, e.g., MacLaren, Shei and Thompson (1977 and 1978), Rigaux). Most empirical studies, centred on estimated supply and demand relationships for individual countries and country groups, tend to find that the export demand facing Canada for wheat is highly inelastic, implying that changes in Canadian export levels would have significant effects on world prices and thus that the international grains market is not competitive. The further implication is that Canada can potentially gain in revenue terms by limiting grain exports.

In evaluating this work two points are of key importance: the time period over which the responses are expected or allowed to occur; and the degree to which national or domestic prices round the world reflect world prices (the degree of insulation). In the short run, with no supply response possible, the elasticity will depend purely on demand response to world price in the rest of the world. In general, because of the existence of close substitutes in most uses, one would expect demand to be quite elastic for any particular grain, though in specific instances and in the short run conservative tastes, consumer loyalty and lack of processing/utilization flexibility may prevent these substitution effects from showing through. Even so, basing estimates on ten year average production, consumption and export levels for wheat, and setting ϵ_{RS} to zero in the above expression (1), the elasticity of export demand facing Canada is almost 30 times as great as the elasticity of total demand in the rest of the world, so that one needs very low

elasticities of demand indeed to generate an inelastic export demand for Canada. In the longer run with supply varying, and demand likely to be more elastic, export demand for Canadian wheat must surely be very elastic (elasticities of -20.0 or greater).

However, national protectionist policies effectively mean that supply and demand response to world prices are driven to zero. In the limiting case where the whole of the rest of the world insulates both producers and consumers from the world price, Canadian export demand would be perfectly inelastic with respect to the world (or selling) price. The key here is not simply the divergence between national and world prices (the degree of protectionism) but rather the extent to which changes in world prices are reflected in changes in domestic or national prices, (the price transmission mechanism or the degree of insulation). Bredahl, and Shei and Thompson explore this question in some detail and conclude that export demands for wheat and feed grains are likely to be rather inelastic for the U.S. (between 0 and -1.5 approximately). Canadian elasticities would be approximately twice as large as those for the U.S. It is argued, apparently realistically, that, for instance, the EEC, the USSR and China are all perfectly insulated from world prices by domestic policies, and this is sufficient to achieve very inelastic export demand schedules. However, Josling (1978) finds that, over the period 1968/9 to 1975/6, at least EEC and Japanese domestic price levels did show significant correlation with world (or U.S.) prices. To the extent that insulation from world prices is going to cost money or resources at home, and these costs will tend to increase the greater the degree of insulation, it is not surprising to find that, over time, even the most apparently protectionist countries do adjust domestic prices to reflect world price changes¹. In the longer run, then it seems likely

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1. Concern over the cost of the Common Agricultural Policy within the EEC will be likely to prevent common prices rising forever above world price levels, and some explicit link to world price levels may even be developed. Was the Russian change in policy in 1972 to boost livestock production taken independently of the state of world grain markets at that time? What would be the policy response of importers to deliberate trade price manipulation by a grain exporting cartel?

that the export demand facing Canada is pretty elastic, and that changes in Canadian export volumes (independently of the rest of the world's exporters) will not have very much effect on world prices in the longer run. In other words, Canada can be treated as a price-taker in the longer run. Although there remains some scope, through stock adjustments, to manipulate world prices in the short-run, this will be limited to those occasions when export competitors do not retaliate or take advantage of this manipulation.

Domestic prices within Canada will essentially be set by world prices, so long as exports and imports are unimpeded, and so long as there is no price discrimination between the domestic and export markets. As far as feed grains are concerned, this question has been comprehensively examined recently by the Canada Grains Council (1979(b)). Currently, the existence of a tariff on imports of U.S. corn, a rigid pricing formula for CWB sales of grains into the domestic market, some constraints on the movement of grain off the prairies and the fact that arbitrage between the domestic and export markets is prevented except at the primary producer level, all mean that from time to time domestic prices for particular grains (and grades) can become divorced from world price levels. However, the discrepancies are not typically large, and moreover do not disguise variations in the world price.

iv) World Trade and Price Variability

One, if not the major, consequence of national insulation policies is that the variability of world prices is substantially increased. Year to year fluctuations in supplies and demands generate changing export and import requirements which in turn affect the determination of world prices. Since the rationing effect of changing world prices is thwarted, in the short run, by many national insulation policies so the changes in world prices will be larger than otherwise.

As shown in Table II.18, grain production tends to be more variable than grain consumption or utilization at the world level. World trade in grains (measured as total exports), as the safety valve

in matching domestic supplies to domestic demands, obviously shows even more variability. Over the period 1960 to 1978 the volume of world trade diverged from its upward trend by more than 85 per cent one year in three, or by about half of Canada's average total grain exports one year in three. On a country by country basis, production is very much more variable in Canada (and Australia) than elsewhere (see Table II.19), with wheat production (over the period 1960 to 1973) diverging from trend by more than 25 per cent one year in three (compared with a world coefficient of variation of about 5 per cent, and for all exporters combined of about 9 per cent).

The coefficient of variation around trend for world wheat prices (1960-78) is 30 per cent, and is almost 20 per cent for U.S. corn prices (as a proxy for world coarse grain prices). The instability in world grain prices is clearly much more severe than the variations in quantities traded (as would be expected in a protectionist /insulationist world) and the major source of the instability in Canadian grain incomes is obviously this variable world price associated with variable yield and production in Canada. The question of the most appropriate response to this variation is postponed until Section IV of this report.

II.4 Projections of Production and Trade

The production of wheat and other grains and oilseeds over the period 1966/7 to 1976/7 has shown a significant tendency to increase, with wheat production expanding at about 1.3 per cent per year, due to increased yields from a more or less constant acreage. Coarse grain and oilseed production has increased by an average of 3.9 per cent per year, made up of average annual increases in yields per acre of 2.2 per cent and in acreage sown of 1.8 per cent (see Table II.20). Combined with linear trends in domestic disappearance (1956/7 to 1975/6), these trends would yield an exportable surplus of grain of between 26 and 30 m.tonnes by 1985.

The Canada Grains Council (1979), estimated that trends in production and domestic disappearance (over a slightly different historical period than those used above) would generate an exportable grain surplus for Canada of between 25 and 27 m.tonnes/year. (cf 1974/5 to 1978/9 average exports of 18.8 m.tonnes, and a record export movement of 21.7 m.tonnes in 1977/78).

The Canadian Wheat Board, basing projections on the maintenance of current shares of a growing world feed and food grain trade, estimate that Canadian exports could be as high as 30m.tonnes by 1985.

Thus the projections of historical trends in both domestic production and disappearance and of trends in world grain trade are broadly consistent. Both suggest a considerable growth in grain exports over the next 5 years. Moreover, both trends suggest a change in emphasis in both production and trade away from wheat and towards coarse grains and oilseeds (a fall in wheats share of total export volume from its current level of 65 to 70 per cent to a level of perhaps 50 per cent by 1985).

Obviously such linear extrapolation of recent history is a naive if not foolhardy method of forecasting the future. Nevertheless present tendencies do suggest that if anything, achievement of Canadian

export potential will depend as suggested earlier, on continued growth of domestic production (and ability to deliver increased quantities to the world market) rather than on aggressive marketing in order to win an increased share of the world market.

II.5 Policy Implications

The nature of the grains industry in Canada places two major constraints on the development of farm policy which are not present, or present to a much more limited degree, in other agricultural commodity sectors. Firstly, the major market for the industry's output is the world market. Ability to influence to manipulate prices to the advantage of the producer is thus limited. If attempts are made to support producer prices over and above market determined prices, the major burden of such support must inevitably fall on taxpayers rather than consumers. Secondly, the major domestic market is the market for feed grains and thus involves other agricultural producers. The political power of farm lobby has been effective in other commodities in obtaining economic intervention in their favour at the expense of consumers. Within the grain sector, however, the farm lobby is necessarily divided against itself since it contains both producers and users. For these reasons, the protective and supportive elements of farm policies are likely to be limited, or appear in different guise, compared with commodities (e.g. Dairy) with major markets within national boundaries and where the division of interests between producers and users is mirrored by the interests of farmers and consumers.

The major issues arising from the structure of the industry may be grouped within five broad categories: The Farm sector policy; Marketing policy; regional and rural development policy; national economic and social policy; and international obligations and policy.

Farm policy implications The predominance of grain income is gross farm income in Western Canada, and especially of wheat income in Saskatchewan, means that attainment of fair levels of and stable returns for farmers is very heavily dependent on the grains industry. Intervention in the industry to achieve these goals, however, run the twin risks of exacerbating the income problems for livestock farmers and of changing the cost structure facing the grain farmer to eliminate initial income advantages. The variability of gross grain income depends on yield, price and sales variability and poses policy problems

at both the aggregate and the micro or individual farm level. It seems likely that the problems of low returns and of the adverse consequences of variable returns are more acute for the smaller farm than the larger ones. But improvement of small farm incomes will, unless limited, be of more benefit to the larger farms, while encouragement of farm size increases may conflict with objectives of maintaining family farms and leaves unanswered the question of what happens to those leaving the industry.

Marketing policy The prairie region, as the major producing area, has two characteristics which are important to marketing policy. First it is largely a dry-land short growing season region with limited crop alternatives which means that the grain produced is limited to a few species with very similar production cycles. The harvest is concentrated, leading to problems of storage and scheduling flows through the marketing channels, and the potential for diversification and thus price and yield risk spreading within crops is limited, which places an additional burden on the marketing system to provide this risk diversification. Secondly, the major (export) markets and a large part of the domestic market are located at considerable distance from the producing regions, the routes to these markets are characterised by a lack of economically competitive alternate modes of transport, and by a natural concentration of nodal points (potential bottlenecks) at the east/west of the region. Opportunities for the satisfactory performance of competitive forces are thus likely to be limited by the economies of size and scale in providing efficient transport and handling facilities and by the limited alternatives available to producers in diversifying production patterns. These problems are likely to be exacerbated by the variability in production and thus by the variability in demands on the marketing system.

National policy Over and above national policy goals of rising real income for all (including farmers), equitable income distribution (i.e. 'fair' returns to farmers), and balanced economic development and harmonious provincial relations, grains industry policies can have important contributions to the stability of prices and the balance of international trade. The grain contribution to the balance of trade is not insignificant and policies to improve the balance may include policies to encourage grain production. Again, however, the encouragement of grain exports, if it is at the expense of secondary processing and livestock production, may not lead to improvement since there is a livestock product component to the balance of trade as well. The importance of the interaction between grains and livestock is repeated for price stability goals.

International policy The importance of the world grain trade to Canada, particularly western Canada and conversely the importance of Canadian supplies to the rest of the world, particularly to the centrally planned economies and to less developed countries, means that grains policy and international policy are to some extent interdependent. For instance, Canada's food aid policy is bound to have a sizeable grain component and the size of this program will have implications for the grain industry. Canada's stance in negotiations for world food reserves, on international grains agreements and on grain and grain product tariffs and non-tariff barriers, is likely to influence reaction to Canada's position on other international issues. Canada's willingness to extend credit to and trade with foreign powers is largely a matter of foreign policy but can be of significant importance to the export grain business.

The range of policy implications for government intervention and regulation of the grains industry is thus very broad. Not only does this complicate the design and implication of grains policies, but, perhaps to a greater extent, it makes objective evaluation of such policies very difficult.

Before tackling this, however, the next section deals with the development of the major grain policies and their possible future direction and describes the policy formation mechanism.

III Current Policies, The Policy Mechanism, and Possible Future Direction

III.1 Introduction

The history of government intervention and regulation in the Canadian Grains industry, at least in Western Canada, is as long as that of the industry itself¹. The building of the Canadian Pacific railway, with the help of \$25m and 25m acres granted by the Dominion government, enabled the development of the Canadian North West and the settlement of what was to become the bread basket of the world. There followed the introduction of the Manitoba Grain Act (1900) and the Canada Grain Act (1921) to ensure equality of access, protection of producers rights and the quality of the product. There also followed central selling agencies (1919 and 1925) and eventually the establishment of the Canadian Wheat Board (1935).

At the risk of oversimplification, the history of policy development shows two distinct, though interrelated, branches. Firstly, associated with marketing the Canadian Grain crop, policy intervention has been concerned to establish grading standards and trading rules (through the Canada Grain Act and the resulting Canadian Grain Commission), to ensure equality of access to the grain handling and transport system (the GHTS) and equality of returns, to ensure "orderly marketing", the control or elimination of speculation and uncertainty at the expense of producers, and central control over sales, grain movement from farms to port and stock levels, (through the CWB). Secondly, policy intervention has been concerned to ensure that rates charged on the movement of grain from the country to port do not exploit the captive users (the producers) and that there is an adequate provision of these transport and handling facilities (through regulation of and assistance to primarily the railways but also to the elevator system both in the country and at dockside).

1. The history is well documented in, for example, Wilson (1978) and the Hall Commission report, Volume 1. It will not be dealt with at length here.

Before turning to a more detailed discussion of current policies, it is worthwhile speculating briefly on the strong pressures from the western grain producers for orderly marketing, for control over private monopoly grain trading and handling businesses and for equality of access and returns from the sale of grain. These pressures have a long and strong history, and are still very evident in the grains industry of the 1980s.

Early experience with the open market for grain in western Canada was not very pleasant for the then new settlers. Lack of effective communication between farm and elevator, the concentration of cash cropping on few varieties and the resulting concentration of harvest times, severe cash flow problems and high debt structures, and the lack of developed farm storage certainly led to rapid price movements in the country at harvest time. Good prices would be highly prized. High prices one day, only to be destroyed as farmers hurried to deliver grain, would naturally destroy one's faith in the ability of the open market to perform reliably and advantageously. Production itself is hazardous enough in the prairie grain belt without having to put up with the vagaries of a market which must have seemed intent on driving the last nail in the coffin of financial collapse. Small wonder that there arose an intense feeling that the private trade (multinational grain companies and monopolistic railway conglomerates alike) is not to be trusted to serve the farming community adequately¹. That feeling, however well or badly founded, is still strong and still provides the basis for political action and hence the adoption of policy in western Canada.

The rest of this section briefly outlines the major policy instruments currently being used in the grains industry (III.2), notes

1. Why a similar scenario does not seem to have developed, at least so strongly, south of the border is an interesting question. One suspects that the political and social system in the US, with more State autonomy, less sudden settlement over a more hospitable region, closer to market outlets, with scope for diversification, competition between rail and water routes and so forth were more amenable to the development and satisfactory performance of an integrated open market system.

the extent of government expenditure on grains in comparison with other agricultural products and by region, and superficially, with U.S. expenditure (III.3), and attempts to reduce the complex policy making machinery to understandable dimensions (III.4). In conclusion, some general observations are offered on the strategic options available for future grains policy development (III.5).

III.2 Current Policy Instruments

Constrained as it is by lack of space and resources, this report cannot provide a compendium of all policy instruments currently in use in the grains industry. Instead it will concentrate on the CWB and associated marketing instruments, the Western Grain Stabilization Act and those policies associated with the G.H.T.S.¹.

i) The Canadian Wheat Board

The Board is a Crown Corporation and its operations are entirely self-financing, although it does administer some government programs and is reimbursed from the federal exchequer for these². The Board has the sole authority for the international marketing of wheat, oats, and barley from the "designated area" (the three prairie provinces and the Peace river area of British Columbia). Prior to 1974, the Board also had sole control over the inter-provincial marketing of these grains, but the introduction of the New Feed Grains policy removed these monopoly rights over feed grains sold into the domestic market.

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1. A list of omitted instruments would include: Prairie Grain Advance Payments, Temporary Wheat Reserves, Two Price Wheat, Crop Insurance, the Agricultural Stabilization Act, Feedgrains Policy and Feed Freight Assistance. These omissions are not to deny their potential importance in specific instances. Rather it is felt that they are sufficiently peripheral to the central issues isolated here that they can be ignored without detracting from the analysis.
 2. The major ones are the guarantee of initial payments (see below), the prairie grain advance payments program, and two price wheat (see CWB annual reports).

The objectives of the C.W.B. are¹:

- 1) to market as much grain as possible at the best price that can be obtained;
- 2) to provide prairie grain producers with price stability;
- 3) to ensure that each grain producer gets his fair share of the available markets each year.

The major instruments used by the Board to achieve these objectives are as follows²:

- a) establishment of export selling prices, negotiation of export contracts and export market development;
- b) control of deliveries of grain from farms to the CWB through the quota system, which places quantitative limits on individual producers' deliveries based on farm acreages. This instrument serves three distinct ends:
 - i) ensures equity of access to the grain forwarding system;
 - ii) controls intra-year inventories and the scheduling of grain through the forwarding system, using terminating quotas and special quotas restricted to particular areas and particular grades of grain;
 - iii) controls inter-year carryover stock levels, and can be applied to off-board grains as well as board grains³.

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1. Taken from "About the Canadian Wheat Board" C.W.B. Winnipeg.
 2. Full operational details of these instruments can be found in Wilson (1979).
 3. The terminology is as follows: Board grains: all wheat, oats and barley, except Off Board, which are wheat, oats and barley marketed privately in the open, domestic market. Non-Board grains: rye, flax, rapeseed not under the jurisdiction of the CWB, except for rail movement car allocation purposes.

- c) administration of grain forwarding through the allocation of rail cars to specific regions (blocks) of the prairies (the block shipping system), which is applied to all grains, board, off-board and non-board;
- d) operation of the pool accounts. The receipts from CWB sales are pooled for each grain¹. Returns on each grain are then equalised for all producers. Payments to producers are made in two, occasionally three, parts. An initial payment is made on delivery of the grain² and a final payment is made, less handling, transport and administrative costs, when the final pool receipts are known at the end of the crop year. Interim or adjustment payments are made if it becomes evident that the final realised price is going to be substantially above the initial price. Total final realised prices are differentiated by grade, though not necessarily precisely according to the premia and discounts achieved by different grades on the world market. Prices are also differentiated by region, to the extent that transport rates show some, though very small, regional differences. There is no price differentiation for timing of delivery;
- e) Negotiation of shipping and lake freight charges and elevator handling charges (subject to maximum rates established by the Canadian Grain Commission);

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1. Wheat, Oats and Barley. There is a separate pool account for "designated barley (malting barley) as opposed to feeding barley.
 2. This initial payment(price) is announced prior to the sowing of the crop for which it is to apply (i.e. 6 to 18 months before the grain is exported). It is guaranteed by the government and is thus agreed with the federal Cabinet and announced by the Minister. Every attempt is made to set initial prices as close to eventual final realised prices as possible without necessitating the operation of the guarantee.

- f) authority controlling imports of wheat, oats and barley into Canada;
- g) lobbyist with the federal government on behalf of grain producers, though typically used, if at all, covertly and discreetly, some recent actions (e.g. the purchase of hopper cars, and off-board quotas in 1979/80) could be interpreted as having at least some political content.

ii) The Western Grain Stabilization Act (WGSA)

The WGSA was introduced in 1976 and is arguably the most significant piece of legislation for the western grain producer since the Crow agreement, the 1935 CWB Act and the Canada Grain Act. In essence, the WGSA guarantees that the aggregate prairie wide gross margin (cash receipts minus cash expenses) for the six major grains (wheat, oats, barley, rye, flax, and rapeseed) in any one year will not be below the previous five year average of this margin. The guarantee is limited. In the first place, the program is voluntary and the participating producer must contribute two per cent of his gross grain receipts to the stabilization fund. The federal government contributes an additional four per cent of total grain receipts to the fund and pays for the administration. Payouts, when made, are allocated to producers on the basis of their contributions to the fund over the previous three years. On present expectations, the program is actuarially sound in that total payments will not exceed total contributions (and earned interest) over the longer term (typically unspecified), though there is provision within the Act to change the levels of contributions should the stabilization fund move outside certain upper (credit) or lower (debt) limits. In the second place, producer benefits from the plan (and contributions) are limited to the first \$25,000 gross grain receipts, though this limit is to be increased for the 1980 calendar year (the plan operates on a calendar (tax) year) to \$40,000 to account for inflation in average gross receipts since 1976. The actual mechanics

of the program are somewhat complicated but the brief account here (amplified by Table III.1 which shows some of the detail on the plan's operation) suffice as a basis for discussion of its salient features.

The major feature of the WGSa is that it covers not only yields (which it does on a prairie wide average basis in establishing total payout levels, and thence to individual participant average production levels (including yields) when the total is distributed among participants)¹, but also fluctuations in real grain prices (relative to cash costs of production) and in the ability to market grain. Apart from the limitation on eligibility to ensure that large farmers (best able to look after themselves) do not benefit disproportionately, the major principles evident in the design of the program are:

- i) while year to year fluctuations in gross margins should be ironed out, producers should not be shielded from longer term trends, since the latter are the appropriate signals to producers for resource allocation, production and output decisions;
- ii) that costs of production are important but that the appropriate costs to consider are cash costs and not total costs since the level of 'fixed' costs (rents, management and family labour returns, returns on capital, including depreciation) are not unconnected with the level of gross returns in the industry, and to support incomes on the basis of these costs would run the real risk of building in cost (and support) escalation;
- iii) that since the primary beneficiary of the plan is the farmer, he should be required to foot at least part of the bill, but that there is a requirement (although the reasons are either unspecified or incomplete) for some public support;

1. Yield variation is also covered under the Crop Insurance Act which provides all risk insurance at subsidized premiums to producers of field crops.

- iv) stabilization of incomes (gross margins) should generally not take account of individual or regional variation since these variations are the stuff of which resource allocation decisions and fixed asset rent determination are made . Thus to build in these factors at current levels is to freeze them in their current configuration regardless of changing circumstances. Thus the intent of the plan is to cover an area within which resources are reasonably mobile and not necessarily one which is to any extent homogeneous in its production possibilities. The same reasoning applies to the treatment of the six grains combined rather than to each separately, it being practically impossible to design identical plans for each grain (including eligibility criteria) separately when they are produced jointly on many farms.

TABLE III.1 - The Western Grain Stabilization Plan⁽¹⁾
1976, 1977 and Provisional 1978
 (approximate figures)

	1976	1977	1978 ⁴
1. Gross Grain Proceeds : (\$m)	2945	2870	3050
2. Gross Grain Expenses : (\$m)	1345	1455	1700
3. Marketing to Production Ratio:	0.71	0.74	0.80
4. Net Grain Expenses : (\$m) (2*3)	955	1075	1360
5. Net Grain Proceeds : (\$m) (1-4)	1990	1795	1690
6. Eligibility Ratio ⁽²⁾ :	0.686	0.675	0.66
7. Net Cash Flow : (\$m) (5*6)	1365	1210	1115
8. Five Year Average Net Cash Flow : (\$m)	1225	1370	1438
9. Potential Payout : (\$m) (8-7)	-	160	323
10. Weighted Participation Ratio ⁽³⁾ :	0.74	0.74	0.74
11. Actual Payout ⁽⁴⁾ : (\$m) (9*10)	-	118	239
12. Total Levy Payments by Producers : (\$m)	24.3	28.0	28.4
13. Government Levy Contributions: (12*2.0) (\$m)	48.6	56.0	56.8
14. No. of participating producers	131,473	126,555	(n.a.)

Notes for Table III.1

- (1) Sources : W.G.S.A. Annual Reports 1976 and 1977 and W.G.S.A. Handbook, Agriculture Canada, and personal contact with administration advisors. Figures used are rounded approximations.
- (2) The eligibility ratio is made up of two parts: i) only sales of up to \$25,000 per producer have been eligible under the plan (currently this ratio is about 0.72); ii) only 'actual producers' (as opposed to landlords, creditors etc.) are eligible (the current level of this ratio is about 0.92). As of 1979, the first criterion (max. sales) is to be raised to \$45,000 and this is expected to increase the eligibility ratio back up to about 0.90 (which it would have been in 1971 and 1972 had the plan been operating then).
- (3) The weighted participation ratio is calculated as the three year average of the ratio of contributory receipts, (i.e. those receipts on which levies were actually paid), to total eligible receipts, weighted by the net cash flow.
- (4) The actual payout made for 1977, based on calculations done in October 1978, was \$115m, and average payment of \$908 per participating producer (\$748 per permit holder). The maximum payout for an individual producer (with full three year contributions) was \$2,196).

The 'actual payout' for 1978 should be viewed as no more than an exploratory calculation and does not have any forecast value or official sanction. In particular the marketing to production ratios, the cash expenses, and the eligibility ratios are guesses, while the gross grain receipts are subject to revision. Nevertheless, a payout of some sort seems likely.

iii) Grain Handling and Transportation System

There are essentially two main thrusts to the current policy towards the GHTS: the regulation of the potential monopoly power of the railways and, to a lesser extent, the grain companies, in setting rates and tariffs for handling and transportation services; and to ensure the adequate provision of service from and capacity in the GHTS.

The regulation of railway rates on grain in Western Canada is absolutely cast-iron, and takes the form of the statutory Crows Nest Pass rates, still fixed at levels first established in 1897. Regulation of elevator handling tariffs takes the form of maxima laid down by the Canadian Grain Commission, in consultation with the grain companies and in the light of the costs incurred. Companies are free to, and do, charge less than these annually established maxima, but are not free to vary rates between the same type of elevator at different locations within the same company.

Adequate provision of service is ensured, in part, through the establishment of specific rules of conduct, through the Canada Grain Act and the Grain Commission for elevator and grain trading operations, and through the Railway Act for the minimum provisions for movement of grain from the country to port. More important, however, is the considerable public provision of facilities and equipment (rail construction and rehabilitation subsidies, assistance with construction of elevators (Weyburn, Ridley Island development), ownership of elevators at port and, until recently, inland terminals, the purchase of grain hopper cars and repair of box cars and so forth) and the subsidisation of services, particularly rail services on branch lines.

The Crow, or Statutory rate, has long been a bone of contention as far as the railways are concerned. In 1976 the Snavely Commission reported that the railways costs incurred in the movement of grain were not being covered by the Statutory rate revenues, nor was the total branch line subsidy from the federal Government sufficient to make good

the revenue shortfall. The current position, because of cost escalation, is probably worse than the Snavely determined revenue shortfall, but as yet the policy question of where the additional money needed by the railways to cover their costs is to come from is undecided. De facto, the railways themselves and their shareholders, are making good the loss through foregone maintenance and replacement of track and equipment and/or from revenue on other traffic and from other enterprises.

The question of the appropriate configuration of rail lines (and thus to some extent of elevators) in Western Canada has most recently been examined by the Hall Commission. This is related to the Crow in that the over-extension of the branch line system means higher capital costs and lower net revenues than would be the case with a more concentrated system, but also has implications for the provision of service and off-rail handling and transport costs for those served by the branch lines. The latter considerations have been paramount in the Government policy of protecting certain rail lines from abandonment and of paying the railways a subsidy, the branch line subsidy, to cover the costs specific to the continued use of these lines. The Hall Commission made recommendations on the disposition of these lines, a task continued by the Prairie Rail Action Committee (established after the Hall Commission under the chairmanship of Dr. F. Anderson to deal with the balance of the lines not recommended by Hall). As a result, prairie branch lines (as defined for the Hall Commission) have now been classified into two categories; those that can be abandoned; and those whose continued existence is guaranteed until 2000 AD (and on which the branch line subsidy is still payable).

Partly as a result of the Crow rate and as a result of uncertainty about branch line status, (and perhaps, too, as a result of the more profitable demands from other traffic) maintenance and replacement of track and equipment by the railways has been less than adequate

to meet all of the demands made by grain traffic. In recognition of the railways financial position (and resulting lack of enthusiasm) the federal government has committed substantial capital grants for the rehabilitation of the retained prairie branch lines, in addition to several purchases of hopper cars on behalf of the CWB¹.

In an effort to improve the efficiency with which the current rail and elevator system moves the prairie grain crop, the government commissioned a report (Booz-Allen, Hamilton) to discover where economies and improvements could be made. As a result of this report a Grain Co-ordinator has now been established with responsibilities to oversee the organisation and operation of the grain movement independently from the main interested parties (the CWB, the railway companies and the elevator companies). The grain co-ordinator reports directly to the Minister responsible for the CWB (see below).

1. The CWB recently (1979) ordered more grain hopper cars on its own account. For more details, see Harvey (1980).

III.3 Federal Government Expenditure on Grains

Government spending in the grains sector, and particularly the prairie grains sector, can be put into perspective relative to other areas of government spending in agriculture and in total, relative to gross output of the economy and relative to farm cash receipts as follows (see Table III.2).

Apart from 1937/38, total government expenditure on agriculture as a percentage of GNP and of total government expenditure are very stable. As a percentage of farm cash receipts, however, they show more variation and there may have been a tendency for the public sector expenditure to increase over time when compared with farm cash receipts (i.e. the latter have been tending to fall relative to growth in GNP and total government expenditure).

Expenditure on grains, especially on grains by region in Canada, presents a difficult allocation problem and it has not been possible in this study to do this on an historical comparative basis. In 1977/8, however, some \$305m was spent on the major grain and oilseed related programs, that is about 29 per cent of the total agricultural expenditure. Of the total grain expenditure about \$245m (or 80 per cent) was directed to the Prairie Provinces (of which rail subsidies and assistance accounted for about \$145m and the WGSA a further \$55m).

This may be compared with an expenditure on Dairy related programs of about \$325m (31 per cent) and a total livestock expenditure of about \$480m (46 per cent). A rough estimate of the provincial distribution of total expenditure on agriculture and the relationship of this expenditure with farm cash receipts and the number of census farmers is shown in Table III.3.

Thus, in the Prairie provinces, about 57 per cent of allocatable government expenditure is devoted to grain related programs. This is almost exactly the same percentage as grain of total cash

receipts in 1978¹. This may be contrasted with the dairy expenditure (31 per cent of the total) and the dairy products farm cash receipts as a percentage of the total (over Canada as a whole) of 12.5 per cent in 1978.

It seems, then, that total federal government expenditure in Agriculture is not at present demonstrating any significant tendencies to increase or decline relative to economic growth or total government expenditure and that within this stable relationship, the portion of expenditure allocated to grains is consistent both with the proportion of total farm cash receipts generated by grain production, and with the regional distribution of the industry within Canada. There does not seem to be any immediately obvious expenditure distortion implicit in these figures, at least with respect to grain, though the question of whether there should be greater distortion must await further analysis and discussion, of which this study is a part.

Over the recent past, however, there has been a significant change in the emphasis of federal grains related expenditures. While a complete analysis has not been possible, Table III.4 shows expenditures under some major programs since 1966/67. The changing emphasis from grain storage and restricted production (Temporary Wheat Reserves and LIFT) towards stabilisation of prices and exports of grain (W.G.S.A. and Transport) is demonstrated in this table. Also the concern over world grain prices and their effects on the Canadian consumer is shown in the Two Price wheat program expenditures. The grain price escalation of 1973/75 had an immediate impact on the cost of the aid program, but there is evidence of some subsequent restraint on the total value of this aid with a consequent fall in the volume of aid shipments of grain.

1. The comparable figures for the whole of Canada are: grain expenditure 29 per cent of total; grain receipts, 31 per cent. of total farm receipts.

In comparison with the United States, federal government expenditure on the grains industry does not seem extravagant. Although it is difficult to make rigorous comparisons, Table III.5 shows that the U.S. wheat support programs have been worth, and are currently worth, some \$20 per tonne of wheat produced¹. In contrast, the Canadian expenditure on grains in the Prairie provinces (1977/78) amounted to just over \$7 per tonne (average production of 6 major grains, 1974-1978).

Certainly during the late 1960s when grain stocks were building and farm incomes, particularly grain incomes, were low, the U.S. support programs were significantly richer than the corresponding Canadian support programs. The strength of government support in the U.S. compared with Canada, as well as the differences in methods of support, certainly colours the comparative developments of the grains industry on either side of the border, and should not be forgotten when considering the apparent differences between the two countries.

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1. U.S. grain support programs typically have four possible elements:
 - a) Publicly owned and financed grain reserves;
 - b) Farmer owned reserve stocks, financed through government loans at a pre-determined crop value (the loan rate) and through storage cost subsidies;
 - c) Deficiency payment schemes to make up the difference between average market prices and target prices;
 - d) Voluntary acreage reduction/diversion schemes (the set-aside programs), for which participation is linked to eligibility for diversion or deficiency payments.

Thus the U.S. policy towards grain production involves publicly funded programs to reduce supplies (stock building and acreage diversion) and supplementary support prices over and above price increases resulting from restricted supplies. In order to reduce resulting stock accumulations it has also been necessary to pay export subsidies at times.

TABLE III.2 - Total Federal Expenditure - Agriculture

Year	TOTAL EXPENDITURE		PERCENTAGE DISTRIBUTION				TOTAL AS A PERCENTAGE OF			
	\$m Nominal	\$m ¹ (1977)	Production and Marketing	Price & Income Support	Education, Extension Research	Admin.	GNP	Total Fed. Govt. Expendi- ture	Farm Cash Receipts	
1933/34	21.6	100	60.3	15.8	19.1	4.8	0.5	6.1	5.1	
37/38	62.0	270	33.3	54.5	10.4	1.8	1.2	13.8	9.5	
43/44	66.3	246	37.4	51.9	8.5	2.2	0.6	1.5	3.6	- 45 -
65/66	387.3	745	35.3	41.8	19.7	3.2	0.6	4.7	9.1	
66/67	442.0	822	35.4	40.8	20.2	3.6	0.7	4.7	10.1	
71/72	395.0	635	40	30	20	10	0.4	2.3	8.8	
77/78	1050	1050	35	45	12	8	0.5	2.4	10.5	

1. Deflator = C.P.I.

SOURCES : Task Force Report (1969) from Garland and Hudson, Government Intervention in Agriculture. (Canadian Agriculture in the 1970s) for figures from 1933/34 to 1966/67.

Later figures estimated by the author and not strictly comparable, from Public Accounts of Canada. The same source was used to generate the numbers quoted in the text. Given the juggling that is necessary to allocate budgetary classifications of expenditure to commodities and to regions, these figures must be treated as ball park estimates only. It might be hoped that more definitive numbers will be forthcoming from the work currently under way in the government on topics such as the Agricultural Development Strategy.

TABLE III.3 - Provincial Distribution of Federal Expenditure (1977/78)

	Maritimes	Quebec	Ontario	Prairies	BC	Canada	Not allocated	Total
Total Govt. Expenditure (\$m)	50	180	160	425	35	850	200	1050
As % Farm Cash Receipts from Market Place	15	15	6	9	9	9		11*
Expenditure								
\$ per census farm (1976)	5,000	4,200	2,000	2,800	2,800	2,900		3,600
1978 Total Farm Cash Receipts per census farm (1976)	35,275	38,750	43,775	37,680	42,585	39,650**		

* Differs from the previous percentage because of adjustments to farm cash receipts.

** Differs from statistics presented in Section II because of different definition of census farm.

TABLE III.4 - Some Major Grain and Grain-related Programs; Government Expenditure \$m

	Temporary Wheat Reserves Act ¹	LIFT ²	Guarantees ² on Initial Prices	Two Price ³ Wheat	W.G.S.A. ⁴ (Government share of levy)	Western Rail expendi- tures ⁵	Bilateral aid ⁶ grains purchases
1966/67	36.8	-	-	-	-	N.A.	55.2
67/68	46.8	-	-	-	-	N.A.	52.2
69/70	79.8	-	-	-	-	N.A.	73.5
70/71	53.9	57.6	18.3	-	-	N.A.	52.2
71/72	33.2	5.7	11.2	-	-	32.7	53.4
72/73	25.8	-	3.9	-	-	37.8	50.3
73/74	12.8	-	-	84.1	-	45.6	49.8
74/75	-	-	-	126.6	-	75.5	69.0
75/76	-	-	-	95.2	-	82.5	105.3
76/77	-	-	-	39.5	48.7	N.A.	82.5
77/78	-	-	-	35.9	56.0	63.7(19.7)	86.3
78/79	-	-	-	-	56.8	N.A.	75.7
							57.9

NOTES for Table III.4

1. From Wheat Board Annual Report, 1971/2, on a crop year basis. Prior to 1966/67 a total of \$428.8m was spent under this program, or an average of \$35.7 per year since its inception in 1954.
2. Figures from Orientation of Canadian Agriculture, Task Force Report, Agriculture Canada 1977, p.44-45 fiscal year basis.
3. Figures from draft press release, fiscal year basis. Notice that this expenditure is really a consumer subsidy (discussed below) and is not attributable to the agriculture industry or the Prairies directly.
4. Figures calculated as twice producer levies, exclude interest earned on W.G.S.A. account and exclude administration. The Government share of the levy is twice that of the producers.
5. Figures from Hall Commission Report and report by Snively to Grain Group (1977), refer only to branch line subsidies and do not include car purchase or other expenses. The figure in parenthesis in 1977/78 is the money spent on branch line rehabilitation.
6. Agriculture Canada, Trade Division, P.P.E. Branch figures. (These aid expenditures have not been included in the earlier figures on government grains related expenditures.)

TABLE III.5 - U.S. Wheat Support Programs

	Government payments (\$m)	¢/bushel produced (¢/b)	\$/tonne produced
1966	681.3	52	19.1
67	727.1	48	17.6
68	746.0	48	17.6
69	855.9	59	21.7
70	871.0	64	23.5
71	885.7	55	20.2
72	858.7	55	20.2
73	478.2	28	10.3
74	-	-	-
75	51.0	2.4	0.88
76	145.0	6.7	2.5
77	996.0	55	20.2
78*	615.0	52	19.1

* Preliminary

SOURCE : ESCS, USDA Commodity Fact Sheet, 1978 Wheat Program and Wheat Situation, ESCS, USDA, No. 248, May 1979, Table 1.

III.4 The Policy Making Process

The policy making machinery for federal grains policy is fairly complicated. An attempt to reduce it to a schematic diagram is made in Figure III.1¹.

The major feature of the diagram, (apart from the freudian slip of having all arrows into the federal cabinet and none out), is the division of responsibility for grains policy between four major Ministers; Agriculture, I.T. and C., Transport and the Minister responsible for the CWB. At least since the formation of Grains Group, a special interdepartmental advisory group reporting to the Minister, in 1970, the Minister responsible for the CWB has tended to take a lead role in grains policy, by drawing on expertise within and through the Grains Group (as well as the CWB itself). The complexity has also been reduced during those not infrequent periods when the CWB and transport portfolios have been shared by the same person. While Agriculture and the CWB must seem to be logically connected, the split of Ministerial responsibility does allow for an East-West (livestock-grain) balance of agricultural interests within the Federal Cabinet, the advantage of which has been sufficient to outweigh the disadvantages of separation.

By and large, the 'operational arms' of the federal government, the Commissions and Boards, including the Wheat Board, are left to get on with their jobs. Only on occasions such as the development and implementation of the Feed Grains Policy, do these organisations become

1. Excluded from this diagram are 'secondary' government departments such as DREE, CCA, and CIDA which have some part to play. The major pressure and interest group channels are shown but are not intended to be an exhaustive description of this.

actively involved in the policy process. Nevertheless, their ongoing actions by themselves are likely to shape policy to some extent, for example, the CWB's decision to buy hopper cars and its 1977/78 export program, which highlighted the capacity constraints of the GHTS, are likely to influence and affect policy decisions.

Given the complexity of the machinery, one might expect that grains policy strategy, perhaps more than most, is determined by the ability of a few individuals in the machine to take de facto control over policy development and attract the necessary argument and expertise to support that development. There is some evidence for this in the recent history of grains policy in that the Liberal Minister responsible for the CWB, The Hon. O. Lang, was able to develop and implement policy changes such as the feed grains policy, and to at least initiate discussion of the Crow rate issue, in spite of some fairly significant political opposition from within the machinery itself, to say nothing of the opposition from the industry and interested parties.

In general, however, the grains policy machinery is essentially a re-active rather than an active mechanism, reacting to pressures and interests from both within and outside the formal policy machinery. Although in principle, and from time to time in practice, it is possible for a policy strategy to be developed within the mechanism (e.g. within Grains Group) and proposed and promulgated by one Minister, in practice this happens infrequently, if at all.

III.5 Policy Direction

Whether by accident or design, this report has been commissioned almost exactly ten years after the Task Force Report, 'Canadian Agriculture in the Seventies'. It is interesting to note the recommendations made in that report and the progress that has been made since then.

The Task Force made a total of 16 recommendations concerning wheat, feed grains and oilseeds. The Task Force recommended changes which favoured a more open market, and suggested that the job of marketing grain should be separated from the tasks of stabilizing income and ensuring equity. Made against a background of burgeoning grain stocks, of low prices and of limited export movement, and of an apparently secular decline in Canada's share of the world market since the mid 1960s, the preoccupation was with removing the excessive grain stocks. Perhaps not surprisingly, in view of the limited exports and in those days before rapid cost escalation, the Task Force did not find it necessary to recommend any changes in either rail rates or physical capacity of the GHTS.

In many instances, public policy towards the grains industry has moved at least as far as the recommendations of the Task Force, and in significant instances (feed grains policy) further than those recommendations suggested, although it has taken almost ten years for some to come to fruition.

Feed grains policy has clearly moved firmly in the direction of the open market mechanism, to a greater extent than envisaged by the Task Force, while the CWB, apart from transport and handling problems, has disposed of large stocks and has resisted building new ones, and has been attempting to market what is produced. The stabilization plan recommended by the Task Force (consistent with the Agricultural Stabilization Act of the time) has been superceded by a more sophisticated

c) Adopt a fully fledged free-enterprise strategy and emphasise market pricing as an allocative device, which would involve user-payment of rail rates, limitation or elimination of price pools and quotas by the CWB, elimination of the CWB's monopoly over export grains, encouragement of competition between farmers, traders and their organisations, and a tendency to develop a structure not unlike the American system. Perhaps, from the American experience, such a strategy would also involve a significant expansion in the level of public financial support of the industry. At least in its initial stages it would be likely to require considerable public fund sweeteners to make it politically acceptable.

d) Follow a compromise course of attempting to meld the best of the free enterprise system (flexibility, freedom of choice, adequate reflection of market signals and proper compensation for jobs performed and risks taken) with the best of the controlled (centrally planned) system (equity, ability to respond to major international conditions, protection from or alleviation of economic hardship or unduly burdensome adjustment). This strategy can often be claimed, while the 'don't rock the boat' strategy under (b) above is actually followed. However, to obtain accurate information on such questions as 'the best features of each system', 'proper compensation', 'unduly burdensome adjustment' and so on, requires that this strategic choice be made clear at the outset and that the choices and judgements involved be actively discussed by the interested parties. This open discussion of the strengths and weaknesses of each part of the system is not a feature of strategy (b) above.

Of these strategies, option (d) is the most analytically tractable as a yardstick against which to measure the effectiveness of the current policies, since it allows different aspects of the current system to be differentiated and treated separately. However, therein lies a danger. It seems eminently possible, not to say likely, that the combined effects of several relatively modest changes in the current system could well be more significant than the sum of the effects of these changes considered separately.

IV.1 Introduction

The 1969 Task Force made some telling and relevant comments in their report which are worth quoting. "After 35 years (now 45 years) the Wheat Board has become an integral, if not a dominant, part of the prairie grain economy. Its operations and activities pervade every aspect of farm and grain marketing business in Western Canada. At times, indeed, it has been difficult to distinguish between the basic responsibilities of the Wheat Board and the more general aspects of government policy as it relates to the agricultural industry in the Prairie Provinces. Unless such a distinction is made clear, however, the proper role and performance of the CWB is difficult to evaluate." (p. 79) The Task Force might also have added that evaluation of the performance of the grains industry without the CWB is to all intent and purpose impossible from an analytical point of view, since to remove the Board would alter the whole character and climate of the industry, and quantitative, or even unambiguous qualitative evidence on the direction and magnitude of such changes is simply not available.

The Task Force went on to say that it cannot be denied that grain producers have price and income problems. However "to permit these problems to dominate the policies of the Wheat Board cannot but interfere seriously with its primary role as a marketing agency. It is the view of the Task Force that the farm income problem must be separated deliberately from Canadian Wheat Board operations. The Board should not be expected to provide any magic solution to the income problems on prairie farms.

The primary role of the Wheat Board must continue to be the sale of wheat and feed grains at the best possible competitive prices" (p. 80, author's emphasis).

Although circumstances have changed since those conclusions were reached, the conclusions themselves remain valid. To enable the

marketing functions to be considered separately from those concerned with equality of access, income distribution and income and price stabilization, the objectives of the CWB can be re-stated as follows:

- a) to maximise producers revenue from the sale of grain;
- b) to ensure that the physical marketing of grain through the grain handling and transportation system (GHTS) proceeds in an orderly and expeditious manner;
- c) to maintain equality of access to the grain forwarding system, and equality of intra-year revenues earned per tonne of CWB marketed grain for producers.

In this way the three major functions of the Board can be isolated as :

- i) selling grain, pricing it, negotiation of contracts, and the timing of sales to maximise the inter-temporal stream of revenues from the sales of wheat, oats and barley; (termed in shorthand - marketing strategy);
- ii) organisation and scheduling of grain deliveries, and onward movement through the forwarding system to meet shipment dates given any constraints within the GHTS; (termed in shorthand - marketing tactics);
- iii) maintaining equity (equality) of access to the forwarding system and in the distribution of Board generated receipts through the quota and price pooling mechanisms.

This section will examine each of these three functions in turn. The instruments used will be analysed with respect to the transfers involved and their possible effects on the performance of the industry.

It will be seen that the second, marketing tactics, function is the key element of the Board's activities since it is this which provides the all-important link between strategic marketing policy and the end result in terms of equity, income generation and distribution, and stabilization. Particularly with regard to the tactical function, the current regulatory instruments involve a substantial dependence on quantity controls (the quota, car allocation and so forth). For analytical purposes, then, the obvious comparison is with an alternative system which makes more use of the price mechanism, although it should be clear that this mechanism can be used by a statutory marketing board as well as introduced through an open, free enterprise market.

Before turning to these functions in detail, however, several points should be emphasised and clarified.

1. Stabilisation of prices, or revenues, appears in the 'official' listing of the CWB objectives as a separate and major element (see Section III above) and yet has been demoted significantly for the purposes of this analysis. For the purposes of this study it is taken as axiomatic that the CWB, by itself, can do very little to provide inter-year price or revenue stability, that even if it could it would not be in the producers interests, and that in any event both current CWB policy to attempt to market all that is produced and the existence of the WGSa show that this objective is not now viewed within the policy machinery as appropriate for the Board.¹ The WGSa is examined in this section in conjunction with the third (equity/distribution) function of the CWB.

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1. Under a relatively elastic demand facing Canadian exports, stock building and depletion in response to low and high prices respectively would tend to destabilise rather than stabilise revenues. Under an inelastic demand some stabilisation might be possible at the cost of storing and carrying stocks but a growing literature strongly suggests that this stability is very likely to benefit buyers (or competing exporters) rather than domestic producers (see Konandreas, and Schmitz and associated bibliography). Furthermore, a full analysis of the potential gains and losses from an international stabilisation policy would constitute a large and unwarranted extension as far as this report is concerned (see, e.g. Ellinson).

2. The grain trade in Canada, as part of a complex and interrelated world trade, is in many respects extremely well documented and abundant in information. However, in the all important respects of prices actually achieved on the world market and of margins between farm and export prices, volume and timing discounts, contract penalties etc. there is very little detailed information other than aggregate averages such as unit values of grain trade (from import/export statistics), or unweighted average market prices, or quoted asking prices. As with bikinis, what these data show is interesting, but what they conceal is vital. It is a fact, however, that this information is regarded as being all important in the ability to strike advantageous bargains at the right time and that its general release (for use in a study such as this for example) might jeopardize this advantage. As a result only tentative conclusions can be reached about the pricing and export volume performance of the CWB.¹

3. The distinction, in this report, between the marketing activities of the CWB and the performance of the GHTS while analytically convenient, is a gross over-simplification. Since 1973/4 it seems likely that the GHTS, has imposed considerable constraints on the ability of the CWB to follow all of its desired marketing strategy or tactics. In 1977/78, for example, it seems likely that between three and five million tonnes of wheat alone were stockpiled on farms because of capacity or movement constraints within the GHTS. This undoubtedly affects the Board's performance but it is beyond the immediate ability of the CWB to do anything about the constraint. However, even if the current disincentives to expansion of capacity and to enthusiastic and efficient use of existing capacity are removed, a 'perfectly adequate' GHTS, i.e. one with considerable slack or idle capacity in some periods and even some years, will be too expensive for either producers or,

1. Whether such secrecy is really vital may, perhaps, be questioned on the grounds that it seems to be relatively common, albeit circumstantial and qualitative, knowledge within the trade itself under most circumstances.

It can also be noted that the Board itself does not apparently have any ongoing evaluation mechanism, even internally.

arguably, taxpayers to contemplate. The expense involved in providing grain forwarding capacity necessitates that this capacity be fully used and thus that, at times, it will prove a binding constraint, as indeed it has so proved in the 'free enterprise' system south of the border, where the grain forwarding system has also constrained export volumes in the recent past.

4. While it is tempting to compare the performance of the Canadian grain marketing system with either a similar system elsewhere (e.g. the Australian system) or a different system operating for an industry with similar underlying characteristics (e.g. the free enterprise marketing system of the U.S.) this is not attempted here. The reason is twofold. Firstly, the interactions within and between objectives and the structural characteristics of the Canadian grain industry make it (as other grain industries in other countries) sufficiently unique that global comparisons between different systems become meaningless¹. Secondly, to attempt to make any such comparison more meaningful would essentially involve a systematic examination of not just the Canadian marketing system but also of its chosen comparator. This is clearly beyond the scope of this report and its marginal additional value in terms of purely Canadian context is outweighed by the extra cost involved.

As a corollary of these observations it can be noted that any one of the three objectives isolated for the CWB in this report could, in principle at least, provide ample justification for the existence of some form of regulatory marketing authority. In other words, less than fully satisfactory performance in one or a number of areas does not necessarily constitute an indictment of the principle of a marketing board for Canadian grain.

1. McCalla and Schmitz reach this conclusion after examining the U.S. and Canadian systems.

IV.2 CWB Marketing Strategy

The marketing strategy of the CWB can be considered from essentially two angles: the theoretical advantages and potential costs associated with a central selling agency with monopoly trading rights over export grain; and the historical performance of the CWB in terms of revenue generation for the prairie grain producer.

i) Theoretical and institutional benefits of a Central Selling Agency (C.S.A.)

There are significant potential or theoretical advantages to a Central Selling Agency for prairie grains (especially wheat). The major ones may be summarised as follows:

a) The physical and climatic constraints on production, plus the geography of the grain forwarding system mean that marketing of the prairie wheat crop is at once a straight-forward and a highly concentrated business. Dryland farming and the short growing season restrict production to a few naturally suited crops and varieties, of which hard red spring wheat is the most obvious and major example. Harvest is concentrated and the sudden growth in new crop supplies is allied with a transportation system which is single mode (rail) and runs in only two directions, one of which (the East) is effectively closed for three winter months each year. These characteristics provide an economic and technical advantage to a centralised marketing agency versus a free-enterprise system, particularly the rather concentrated free enterprise system of the multinational grain companies.

b) The characteristics of the world market for grains, with many national buying agencies, (particularly in the centrally planned and less-developed countries, but also in Japan), with many protectionist domestic policies in importing countries, and with central selling agencies in export competitors, means that there is a counter-veiling power argument for a monopolistic seller of Canadian grain. Though the counterveiling power of the major private grain companies

is as, if not more, significant in volume terms than the C.W.B., in the latter case it is exercised on behalf of the producers rather than the shareholders.

c) Since the major market for prairie grain is the world market (to a greater extent for wheat and to a greater extent than the U.S.), and given the opportunities for a less than perfectly competitive system to develop in the prairies, an open system (which moreover has other sources of supply than the Canadian crop), may well not be in the best interests of prairie grain producers. A producer's board can guard against the possible exploitation of these opportunities, and as a producers board (with somewhat socialist overtones) may be more appealing to the major centrally planned national purchasers.

d) Central control over export flows and the scheduling of these flows out of the country regions allows considerable negotiating flexibility in making sales, and the associated control over grain stock levels assists in longer-term sales strategy. This power can be exercised in the interests of producers without seriously damaging the interests of other Canadian nationals because of the predominance of the export market.¹

e) In principle, a central selling agency is able to exploit the characteristics of world demand by controlling the quantity supplied to the world market, and thus altering prices and total revenues in favour of the agency and producers. However the scope for this seems limited in the Canadian situation (see Section II above). Because a

1. The CWB's effect on the domestic consumer has been examined by Forbes, who concluded that the Board "has not operated against the consumer interest in.....the bread grains area" and that the opening up of the domestic feed grain market "seems to have the potential of removing restraint" on feed grains pricing and thus the potential damage to the consumer interest. (continued)

CSA has the assurance of the total Canadian supplies, it could speculate between this years and future years prices on world markets, and can enter longer term contracts, without the risk of adverse price margins developing between the farm gate and final selling price. Such margin squeezes are always a possibility within the private trade, a risk which will be built into the planned margin between farm price and selling prices. The risk does not, of course, disappear for the C.S.A. It is simply transformed and internalised.

f) In negotiating national Canadian positions in international grain trade agreements, a central selling agency is of considerable advantage in both providing the necessary information and negotiation input in the first place and in subsequently implementing the agreements. By the same token, a selling agency responsible to producers is also of some potential advantage in arguing producers interests within the national policy context, though there is little evidence of this having been exploited to any significant extent by the C.W.B.

In principle, then, there are some reasonably persuasive and powerful arguments in favour of a Central Selling Agency. Although these are often couched in terms of marketing or bargaining power, in fact the key distinction between a C.S.A. and a free enterprise system is that the C.S.A. is concerned to market the Canadian crop at the best possible advantage to Canadian producers. A free enterprise system,

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1. Prior to the introduction of the New Feed Grains policy, the (continued) CWB had monopoly control over interprovincial as well as international grain sales. Since it also controls imports of wheat, oats and barley, it was then in a position to price discriminate between the domestic and international markets. Its scope for this was limited by the availability of U.S. corn but a tariff of 8¢ per bushel (reduced in the latest (Tokyo) GATT round to 5¢) augmented by transport difficulties during the late autumn and winter did provide some scope for such discrimination. See e.g. Harvey (1977).

on the other hand, would be concerned about marketing company supplies, from whatever source is cheapest and most readily available, at the best possible price. If the free enterprise system were perfectly competitive, with the multinational grain companies treating their grain supply and demand conditions as perfectly elastic, this distinction would be unimportant. It does, however, become important to the extent that this free enterprise system is not perfectly competitive.¹

On the other hand, the lack of competition for a C.S.A. within Canada and the possibility, not to say probability, that negotiations and C.S.A. salesmen will not be rewarded according to results, may mean that incentives to achieve maximum sales at the highest possible price are not as strong as they would be within a free enterprise system. A sense of duty and dedication to producers interests may or may not be sufficient to outweigh the lack of performance related financial incentives with the C.S.A.

It should be noted, however, that there is no reason, in principle, why financial incentives should be absent from a C.S.A., though present in a large multinational company. Nor is there any reason why a C.S.A. should necessarily eschew the use of the price mechanism to control the supply of grain to the export market and the flow of grain through the forwarding system. The fact that the CWB does not generally employ performance related financial rewards within the organisation and uses quantity controls rather than the price mechanism is not a direct and unavoidable consequence of its monopoly position over grain exports, but is rather a consequence of the development of the organisation itself and of other objectives.

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1. While there is certainly competition between the multinational grain companies, it is generally competition to achieve larger market shares and greater margins between buying and selling prices. Larger market shares mean less elastic demand facing companies and more possibility of achieving greater margins between buying and selling prices. It seems likely that within any country as well as world-wide these companies recognise that greater purchases mean higher prices and thus will take account of a marginal cost of acquiring grain that is higher than the average price paid to producers.

ii) Measures and evidence of strategic marketing performance

"Any group of men endeavouring with the best intentions in the world to make a success of selling wheat would be exposed to a great deal of criticism"¹. This applies with greater force to a legalised monopoly board.

As has already been noted, the ability of the analyst to make any penetrating study of performance is restricted by the data available. In this case, the data available is crude and inexact and the resulting evidence is tenuous at best, and at worst no more than redefines the question. More disturbing, however, is the fact that Board officials have not felt able to admit to any internal ex post evaluation of performance, which implies that none is made².

In examining the recent history of export performance of the CWB there are basically three areas worth considering: the volume of grain exported, the prices received for that grain and the mix of grains exported. As far as the volumes and the mix are concerned, their levels and changes relative to production and domestic utilization are the important aspects. Evaluation of pricing performance is more difficult, but essentially involves comparisons between Canadian prices and other international prices and the relationship between CWB asking prices, realised prices and the prices paid to producers.

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1. Turgeon, Royal Commission of Enquiry, 1938, quoted by the Task Force.
 2. The alternative that the results of the internal evaluation are not very flattering and so are not released or discussed seems altogether too cynical to be given much credence. Certainly no evidence of this has come to the attention of this author.

a) Export Volumes

As already pointed out earlier in this report (Section II), the recent history (since 1970) strongly suggests that the CWB has been constrained in its export volumes by the volume of surplus production in Canada and by the ability and performance of the GHTS to move export grain from the country to port¹. In other words there is no evidence that the CWB has been deliberately withholding grain from the world market in anticipation of higher prices in the future or in order to obtain higher prices for current sales. Again, as already noted, the scope for this appears to be strictly limited.

Indeed, because the Board does not hedge grain stocks held against future sales on world grain exchanges, the deliberate stockpiling against anticipated future world prices would amount to pure speculation. There is no evidence that the Board has the specialised expertise, luck or privileged access to restricted information about future events in the world grain market to make such an activity profitable and thus one would not expect such stockholding to be part of the CWB strategy. As a corollary, one would expect the Board to hedge delayed sales as when it decides to retain grain rather than sell it. In fact, through the extensive use of forward and long term contracts (see Wilson (1979)) the Board is able to do this without resort to trading on world grain exchanges.

In addition to being constrained by domestic production and transportation circumstances, Canadian export shares are also heavily influenced by the U.S. policy stance and marketing pattern. This is amply demonstrated in Figures IV.1 and IV.2 which show, respectively, Canadian and American shares of world production, exports and stocks of wheat. Canadian export shares can and do increase to some extent when U.S. shares fall, and vice versa.

L. As will be seen below, there is some reason to question the efficiency with which the GHTS is being used and that, in part, this may reflect on the marketing tactics employed by the CWB, but this is a different question.

FIGURE IV.1 CANADA'S SHARE OF FOUR EXPORTER TOTAL PRODUCTION, EXPORTS AND STOCKS. (WHEAT)

four exporters : Canada, U.S., Argentina, Australia

Source: CWB annual reports
and IWC World Wheat Statistics.

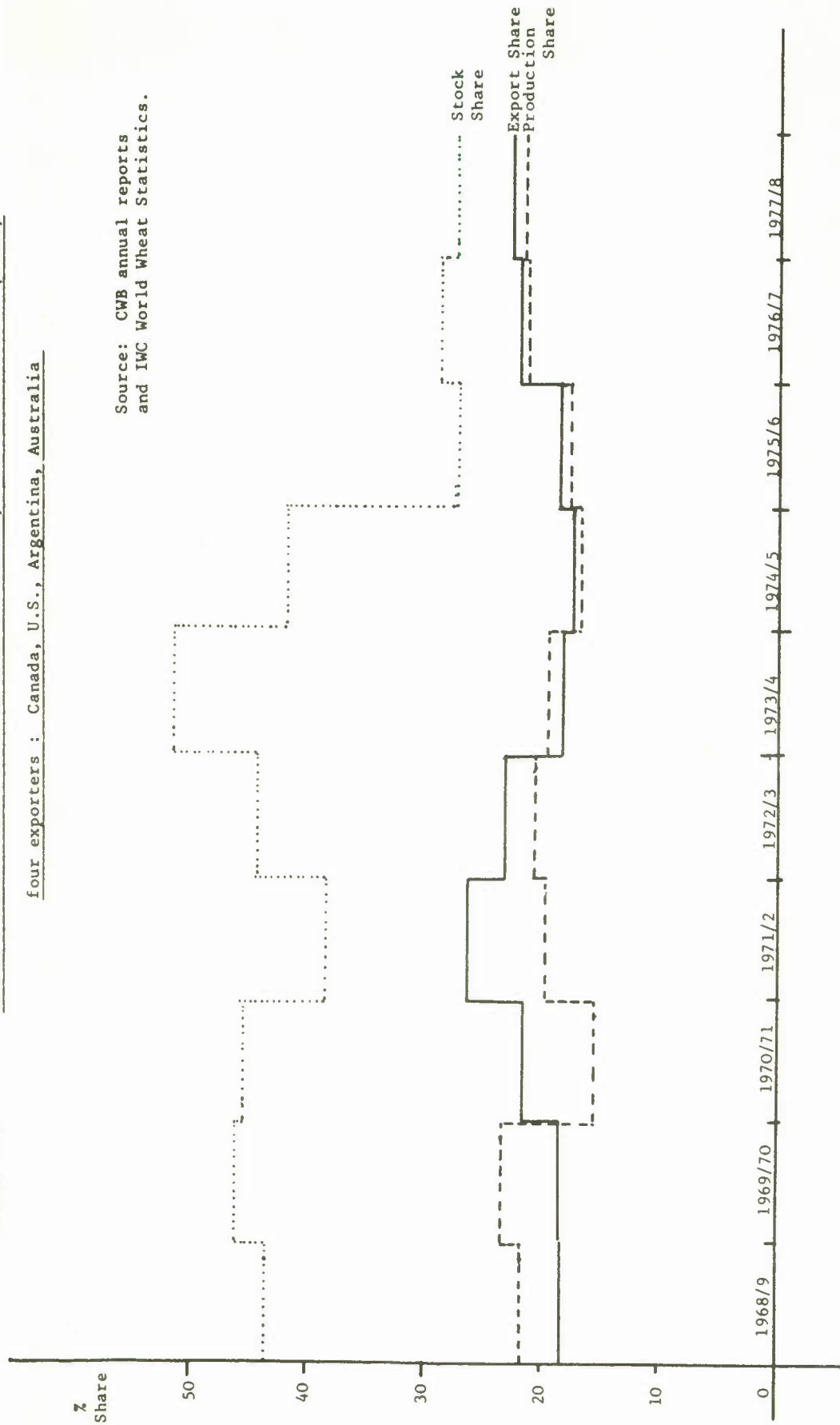
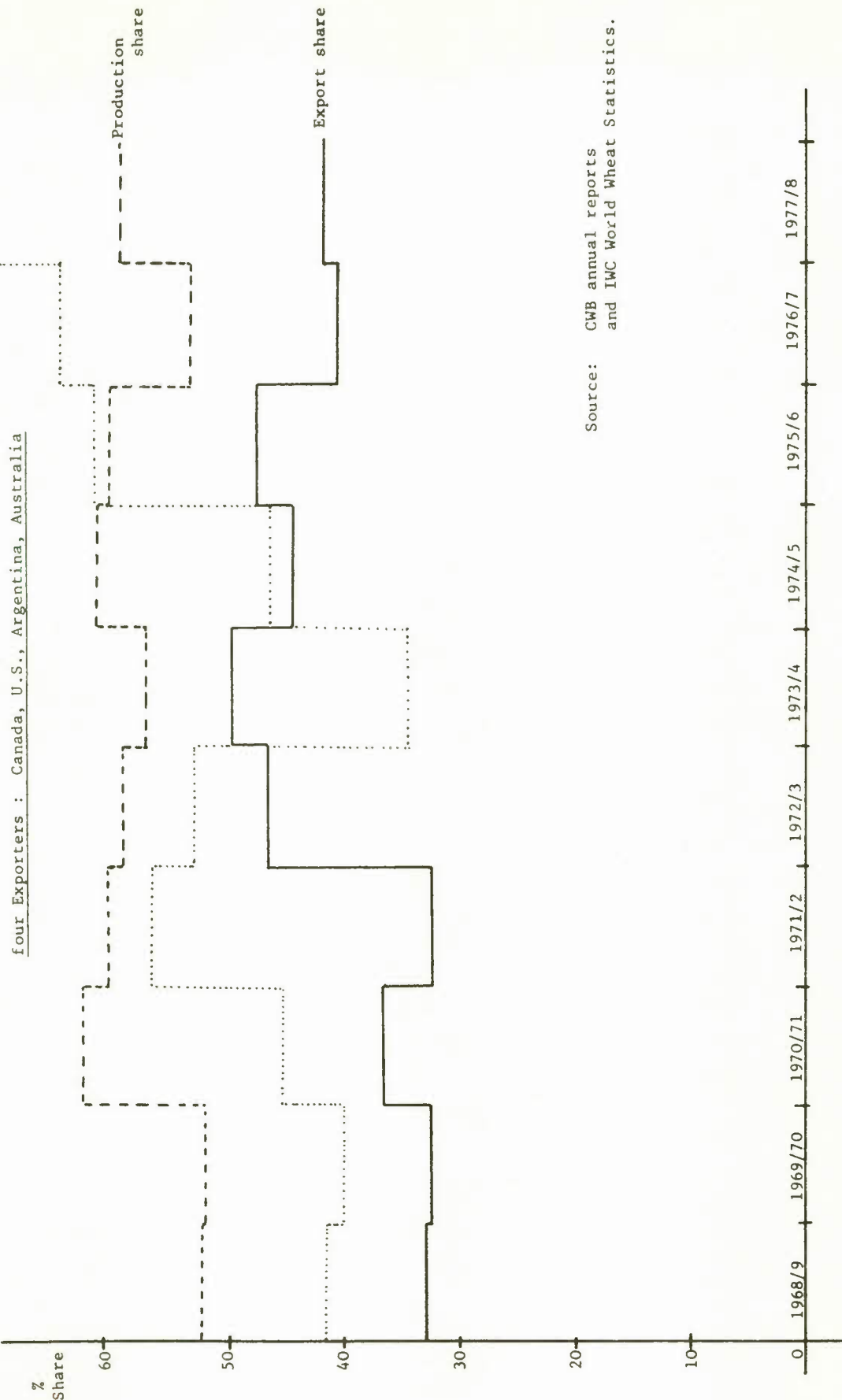


Figure IV.2


U.S. SHARE OF FOUR EXPORTER TOTAL PRODUCTION, EXPORTS AND STOCKS. (WHEAT)



Source: CWB annual reports
and IWC World Wheat Statistics.

The U.S. has provided export subsidies, significant support for storing grain, and domestic price supports, which means that the U.S. export performance is very far removed from being simply an unregulated free enterprise market. If the U.S. policy is to build stocks, as it has been from 1974 to 1978, then export volumes will be reduced and Canada can gain export share up to the limit of production and/or the capacity of the GHTS. If U.S. policy includes, as it presently does, significant deficiency payment provisions, then the competition offered by American wheat supplies to Canadian exports is likely to be strong. Although the W.G.S.A. should help the Board in this respect, it is not a rich program by American standards.

In a very real sense, then, any attempt by the CWB to actively intervene in an attempt to manipulate grain stocks and world prices in an opposite direction to U.S. trends and policy runs the real risk of competing with the apparently long purse of the U.S. Treasury. This is especially the case when the latter is employing export subsidies or deficiency payments.¹



The conclusion must be that Canada's export share has not recently depended, nor currently depends, on the CWB's ability to market the grain but rather on the levels of production in Western Canada, the ability of the GHTS to deliver the grain and on the publicly supported competition offered by the major competitor, the U.S. The extent to which CWB activities influence production and GHTS performance will be returned to below.

1. Government Credit and Aid sales on both sides of the border complicate the above picture but changes in these proportions do not invalidate the conclusions drawn here over the 1970-1978 period. See CWB annual reports and U.S.D.A. Wheat Situation reports for the relevant data. The proportion that Credit and Aid sales form of total exports tends to be higher in Canada than the U.S., because of the extensive use made of credit sales by the CWB itself. Food aid, under PL 480, is higher as a proportion in the U.S. than in Canada.

b) Export Prices and Farm Revenues

b.1) CWB asking prices

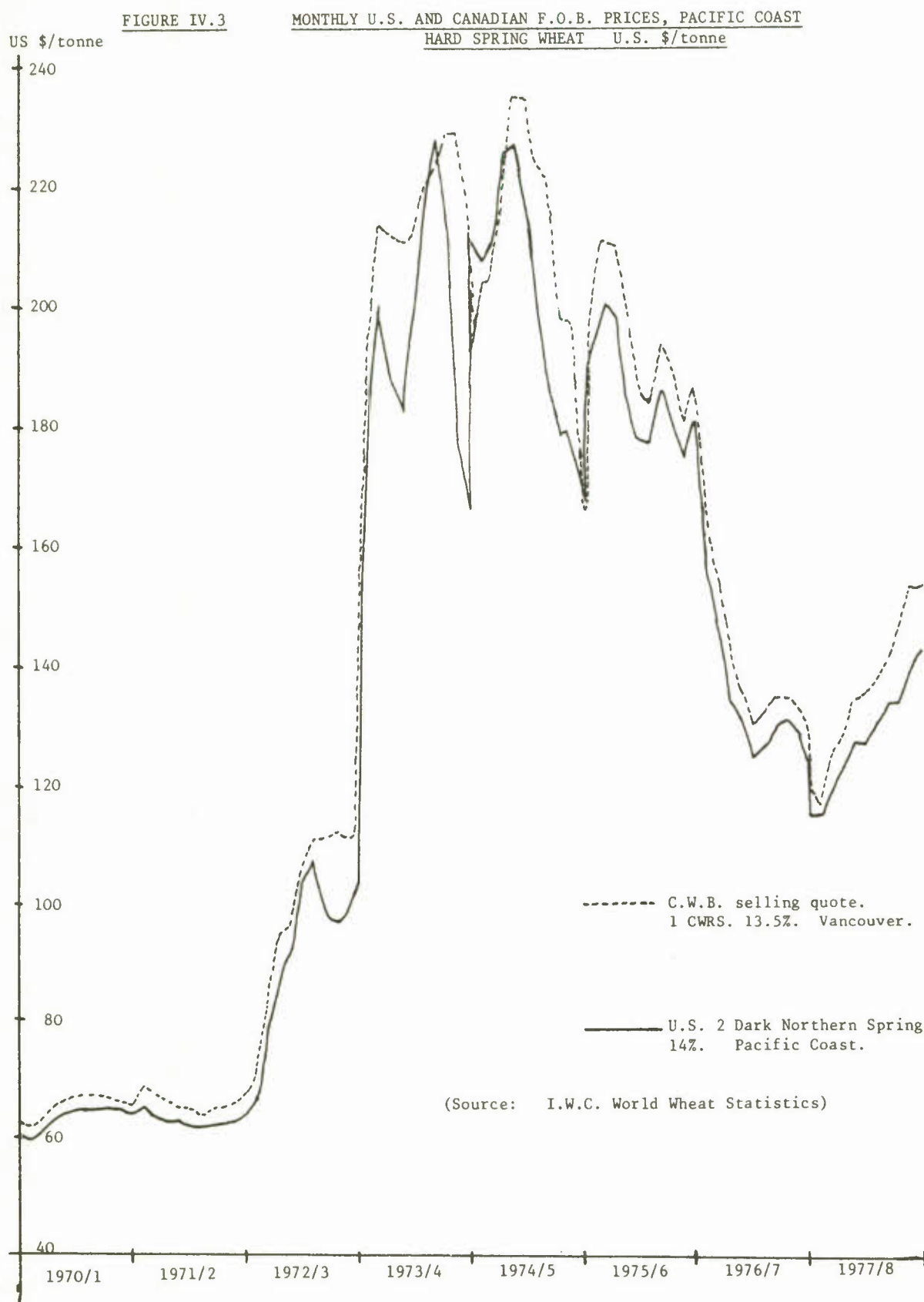
Aside from those periods when the CWB is deliberately out of the market reassessing available supplies, commitments, and transport and handling capabilities, the Board is generally pricing grain competitively and is selling at prices not significantly different from the competition (while making allowance for the relative quality of Canadian export grain, particularly on grading standards). Figure IV.3 shows the most directly comparable wheat prices from the CWB and the U.S. competition, (the CWB quoted price for NO. 1 C.W.R.S. 13.5%, fob Vancouver, and the fob price, Pacific Coast, for U.S. number 2 Dark Northern Spring Wheat, 14.0% protein¹).

CWB asking prices do not necessarily reflect actual sales or contract prices. In fact, however, the former do predict final realised prices as paid out from the pool accounts very well (see Agriculture Canada (1979)).

b.2) Export unit values

Unit values derived from trade statistics² give some indication of the broadly competitive nature of the world wheat market over the recent past. One would expect that an increased share of world markets

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1. Those periods when the Canadian prices diverge significantly from the U.S. prices correspond to those times when the Board was deliberately out of the market. For instance, in the last few months of 1972/3, the Board effectively withdrew from the market because of low stocks and supplies and extensive selling in the early part of the year. In 1973/4, low stocks, a restricted range of qualities available and transport dislocations resulted in the CWB withdrawing from the market between November 1973 and May 1974. In 1974/5 large sales at the beginning of the season (to Japan and the U.K.) and a subsequent poor and low quality crop, aggravated by slow deliveries from farms obliged the Board to withdraw from the market until May 1975. Further details of this sort of activity can be found in the IWC World Wheat Situation.
 2. e.g. FAO Yearbook of Trade Statistics. Unit values derived as total export value per tonne of total exports, all in U.S. \$.



Given the quality of the U.S. crop, for which data has not been obtainable for this study, the lower the quality of the Canadian crop, the worse one might expect the Canadian price performance to be. Over the last eight years this expectation is borne out in the above table. Given a generally higher protein content of northern plains wheat compared with prairie wheat, one would expect a higher protein premium to be reflected in relatively poor Canadian price performance. This does not seem to show through very clearly, though in occasional years (1970/71 and 1975/76) it may have been an important factor. On the argument that high export volumes can only be achieved at the expense of cuts in selling prices per tonne, one would expect adverse price performance to coincide with large export volumes. There is little evidence of this in the table on a single year basis. Alternatively, to the extent that a decline in stock levels results from aggressive selling tactics by the Board, one might expect decreasing stocks to be associated with relatively poor price performance during the same year. Again this is not borne out by the data in the above table.

Effective evaluation of the CWB's pricing performance is a complex and specialist task, and the surface has hardly been scratched here. In essence, the above data do not demonstrate any obvious lack of competitive pricing, or conversely overly competitive pricing on the Board's part, and yet the end result at the farm gate is disappointing. Furthermore, the more obvious reasons for this discrepancy do not seem very satisfactory as convincing explanations (with the possible exception of quality differences)¹.

There are, of course, many factors influencing this relationship, not all of which are under the control of the marketing board, or the private trade in the U.S. The U.S. provides a larger domestic

1. Though it is hard to believe that the variations in quality experienced in Canada were not also experienced to more or less the same degree by the States (North Dakota) immediately to the south.

market for wheat than exists in Canada, which may be to the advantage of American farmers, through providing a stable and relatively strong demand close at hand. The U.S. government, with the exception of the years 1974/5 to 1976/7, has been active in supporting prices, through direct support payments, linked to acreage set-asides, and through the building of C.C.C. wheat stocks, and although these programs are not included in the farm price series as recorded above, they do influence production and marketing decisions and add to the American farmer's flexibility and ability to market grain at favourable prices rather than be obliged, for cash-flow or quota reasons, to market grain at unfavourable prices on local markets immediately after harvest.

Another explanation would be that timing of sales by the CWB has adversely affected the average realised price¹. However, one would expect that bad and good timing decisions as far as sales are concerned would tend to cancel each other out, and one would certainly not expect the CWB to be systematically poorer at timing of sales than the Northern Plains farmer. Long term contracts could affect price performance which would be expected to be poorer on a rising market than a falling one. This is not borne out by the data over the recent past.

Transport and handling problems, and timing of deliveries from farms, do constrain the Boards selling strategy from time to time, and these constraints could well be reflected in poorer average price performance. Apart from a question mark about the Board's ability to negotiate and time sales as effectively as possible in the interests of producers, the constraints imposed by the handling system and by the marketing tactics and equity considerations seem, on the basis of this casual evidence, strong candidates for the explanation of the adverse farm price performance.

1. It should be remembered that the Northern Plains average price is unweighted by sales distribution over time, and thus implicitly assumes uniform marketings throughout the year.

c) The mix of export grains

A third area of export performance, over and above the prices and quantities of grain (wheat) exported, is the mix of grains exported. The CWB has been and is predominantly a wheat board, and over and above this has concentrated on the quality, high protein bread wheats. The question can be raised as to whether it should encourage and develop lower quality, utility or feed wheat exports and barley (and perhaps oats) exports.

Two substantial factors have already been pointed out in this report which would substantiate this argument. Firstly, the growth in world feed grains markets and trade has been and is projected to continue to be stronger than for the food grains (high quality wheat). Secondly, the yield and production trends for these feed grains within Canada have been stronger than those for the high quality wheats. Briggs and Klaffke have recently suggested that the yield advantages of the modern utility wheats (Glanlea and Pitic) more than offset the price discount for these wheats under most of the recently experienced price levels of the C.W. and C.U. wheats. Similarly, barley gross revenues per acre have recently shown some advantage over those of the hard red spring wheats.

It can be argued that the Board has exported these grains as and when they have been grown and marketed through the Board, and to that extent the Board has not penalised the growth and export of grains other than wheat. However, the Board does concentrate on moving the quality wheats and has in the past been inclined to defer or delay barley movements in favour of wheat when transport and handling facilities have been strained. To the extent that the Board's overall operations (particularly the quota and its ramifications) have led to conservative production practices in the prairies, the lack of the growth in production of these grains can, to some extent, be attributed to the CWB, though not to its activities as a central selling agency.

IV.3 Marketing Tactics

Quantitative evaluation of the marketing tactics (the scheduling of grain through the grain forwarding system using the block shipping and quota mechanisms) followed by the CWB is extremely difficult. It is immediately apparent that the Board uses a 'quantity control' system rather than the price mechanism to order this scheduling of grain through the G.H.T.S.. This affects the grain marketing system in three major ways. Firstly, there is little active encouragement to the participants (handling companies and railways) to use the physical plant and equipment efficiently, and hence a lack of innovation and adjustment to changing conditions (particularly from a market emphasising storage as was the case in the late '60s to one concentrating on throughput as is the case now). Secondly, it leads to problems for the interface between the Board marketing system and the marketing system for off-board and non-board grains, since the latter operate largely through the price mechanism with the exception of their command over services from the G.H.T.S.. Thirdly, penalties for mis-shipments and other misdemeanours usually take the form of further restrictions on car allocation (contrary to producers interests) rather than financial penalties with which producers could be reimbursed.

The Booz-Allen report¹ provides substantial evidence of inefficiencies in the use of the current grain handling and transportation system (notwithstanding the lack of physical capacity in this system). The report also suggests that more emphasis on the price mechanism, through providing incentives for efficient use and penalties (i.e. producer recompense) for inefficient use could only improve the efficiency with which the current system is used. It would also follow from an emphasis on the price rather than quantity mechanism that the harmonious co-existence of Board and open markets would be much easier to achieve.

1. This section draws heavily on this report and unless otherwise specified all data are drawn from it.

Specific examples of these rigidities and inefficiencies can be grouped under two major headings: Control of farm delivery patterns; and control of the grain forwarding system.

i) Farm Delivery Patterns and Control

Although a pronounced seasonal pattern to deliveries from farms may be inevitable the price pooling system operated by the Board offers no incentive to producers to delay delivery of grain to the forwarding system, or to encourage delivery during periods when immediate sales opportunities and prices are favourable. The quota system has become increasingly complex and sophisticated to cope with this task. Terminating quotas, which apply only for limited periods, specific delivery quotas for particular grains and grades, and quotas restricted to particular regions (shipping blocks) of the prairies, are becoming increasingly common devices used to bring forth the appropriate grain and grade at the appropriate time. However, insufficient information on the size, grain mix and quality of farm inventories makes this system of scheduling deliveries inexact and somewhat cumbersome. There is, within the present system, no real incentive for producers to either ascertain the exact quality of their stocks prior to delivery or to divulge the information to the marketing system or agencies. This lack of control over deliveries shows up further down the forwarding pipeline in the fact that to obtain, say, 60 cars of high protein wheat at port some 100 cars have to be allocated to (and then moved from) high protein wheat areas. Improvement would need more information about farm (and country elevator) grain inventories. And a more rigorous and detailed car-allocation and quota system would be needed to properly schedule grain deliveries and forwarding. Such a system would inevitably involve substantially higher administration costs, but would not offer the individual producer (or handling company) any specific incentives to co-operate. The benefit would only show up in the final average price received (to the extent that current delivery patterns constrain the Board's ability to take advantage of immediate sales opportunities) and in an easing of the G.H.T.S. capacity constraint on overall movement.

Both of these effects are currently externalities as far as individual producers or handling companies are concerned.

An alternative is to use the price mechanism to internalise these externalities. The use of premia and discounts to reflect both market opportunities and commitments, and the capacity utilization of specific parts of the G.H.T.S., would provide both the incentives and the financial penalties to encourage all participants to use an inevitably limited resource effectively and efficiently. Examples include premia for delivery of certain grains and grades at specific times, farm storage payments and forward contracts between producers and the Board, differentials with respect to drying and cleaning of grain on farm, or at country points, to encourage delivery according to market requirements and ease port and terminal bottlenecks and so forth.

ii) Control over the grain forwarding system

The CWB controls the movement of grain from country elevators to export position through the car allocation, block shipping mechanism. This mechanism applies to all grains, Board, off-board and non-board. Since the private trade's ability to function effectively in the off-board (domestic feed grain) and non-board markets depends to a large extent on its ability to move grain from country positions, the use of the car-allocation system has repercussions beyond the CWB's primary concern: the export of Board grains. In addition, elevator companies are prevented, through the regulation of tariffs by the Canadian Grain Commission, from differentiating rates between elevators and delivery points to reflect cost efficiencies and bottlenecks.

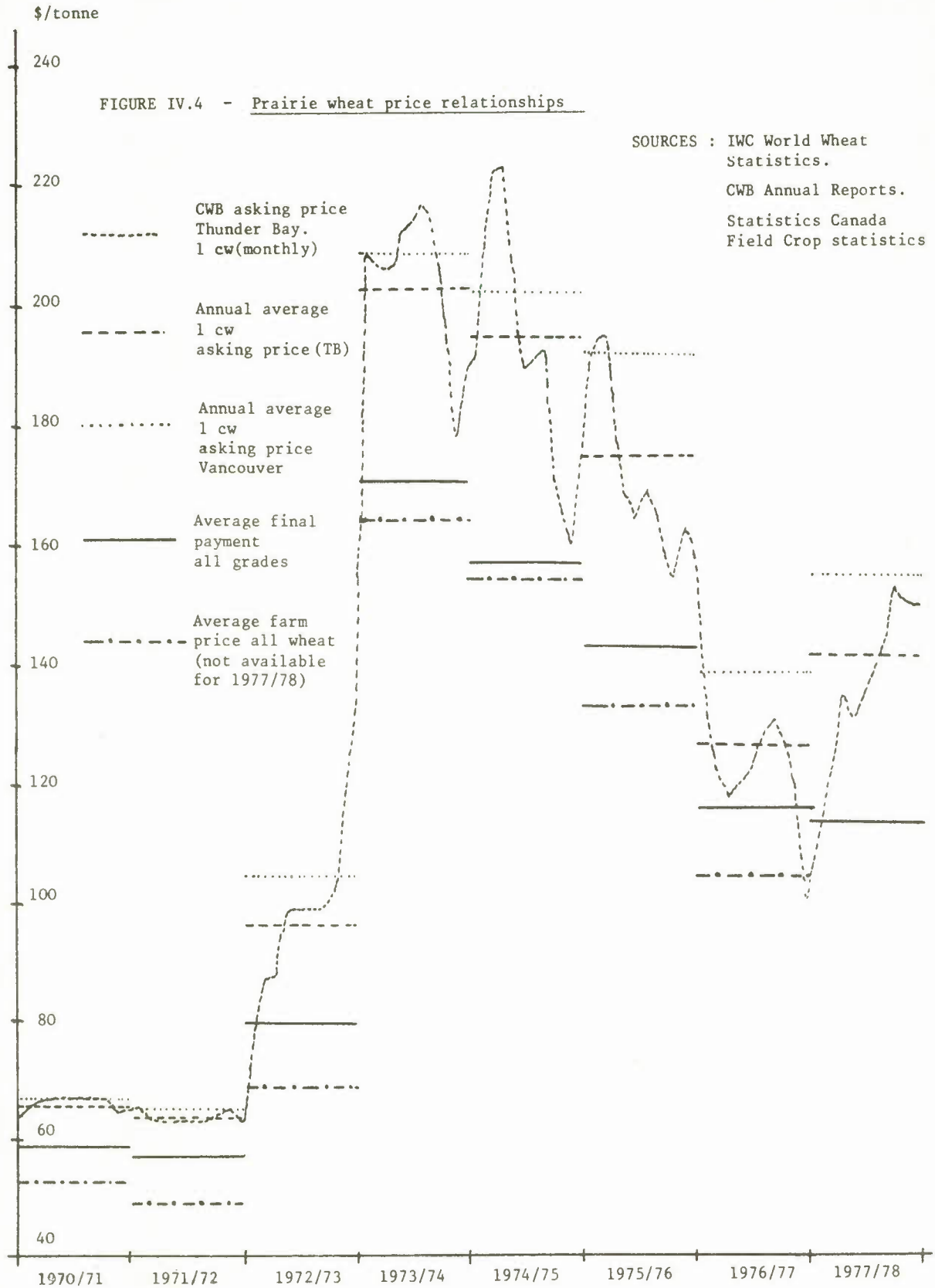
a) Control over scheduling. In principle, quantitative control over scheduling of grain car movements could be more exact than control or influence exercised through the price mechanism, albeit at substantial administrative cost and rigidity. But current practice does not achieve this potential. A survey of movements in 1978 (Booz-Allen) shows that 35 per cent of all cars were unloaded 2 or more weeks

can only be gained at the expense of lower prices compared with the competition. Over the last ten years (1969 to 1978) Canada's unit values have been lower than their average relationship with both the United States and with total world exports at approximately those times when Canada's export share was increased (1970 to 1973 and 1976 to 1978). Because of difficulties with reconciling timing of sales and recording of export statistics, and of quality differences concealed in those aggregates, more specific and detailed analysis of this data is not possible here.

b.3) Prairie wheat price relationships

Figure IV.4 shows, over the last eight crop years, the relationships between the CWB asking prices for 1 c.w. wheat, the final payment average for all wheat grades realised from the pool accounts and the average farm gate price in the prairies. The last price, estimated by Statistics Canada and weighted by sales, includes feed wheat sales into the domestic market as well as sales to the CWB for export. There has been a clear tendency for the West coast asking price premium over Thunder Bay to increase over the period. This reflects a growing demand from Pacific Rim countries, and possibly the additional costs of servicing the West coast. This relationship has raised questions about the equity of the price pooling system (see below).

The differences between average asking prices and final realised prices which show considerable fluctuation, are almost completely explained by periods of 'nominal' asking prices and lack of



sales (already noted) and by the significant variation in the quality of the crop delivered (see CWB Annual Reports)¹.

The prairie average farm price for all wheat sales generally lies below the CWB realised prices for two major reasons; firstly rail freight and country elevator handling charges have to be paid on CWB realised prices; secondly, the farm prices include sales of feed wheat not made through the Board but sold on the off-board market. Depending on the level of farm stocks (the 'openness' of the wheat quota) the discount in prices received in this market, over and above the quality differential, can be quite substantial. The quality differential itself (between Board and non-Board sales) will be smaller, the lower is the quality of wheat delivered to the Board, so that, other things being equal one might expect less difference between the farm price and average realised price from the Board in those years of poor quality crops. Broadly speaking, these hypotheses are borne out in the relationship between final realised prices and average farm prices.

TABLE IV.1 - Marketing margins and marketing costs: Wheat: Prairies
(\$/tonne)

Crop Year	1970/71	71/2	72/3	73/4	74/5	75/6	76/7	77/8
Marketing Margin ¹	6.6	7.4	11.2	7.0	2.5	10.1	11.2	n.a.
Marketing Costs ²	6.6	6.9	6.9	7.1	8.0	8.3	9.0	9.8

NOTES : 1. CWB average realised final price minus Stat. Can. average farm price.

2. Marketing costs comprised only of constant rail freight average Crow revenues to railways per tonne from Snavely Commission report (see below of \$4.78/tonne) plus country elevation charges (without any storage component), as reported by the CWB (Annual Reports).

1. For example, large volumes sold early in 1977/78 and a generally low quality crop, a very low quality harvest in 1974/5 and large volumes sold early in the 1973/4 year with prices in mid-year being largely nominal explain the divergences in these years. Similar explanations apply in other cases.

While the above analysis has been anything but sophisticated, there does not seem any immediately obvious indication that the Board is failing to match world market prices in its selling strategy. To an extent some opportunities may be missed (e.g. through early sales on a rising market). However factors such as the necessity to move grain through the system as early as possible to achieve maximum throughput; long-term contracts which, while lower prices may result, does guarantee volumes, and the recent constraint of the handling system itself all constrain the Board's ability to exploit these opportunities. Nor does the above indicate that farm prices in the prairies, for wheat, are not directly related to the CWB realised prices. However, the all important question of how well prairie grain farmers are doing compared with their counterparts south of the border remains to be examined.

b.4) U.S. Canadian farm price comparisons

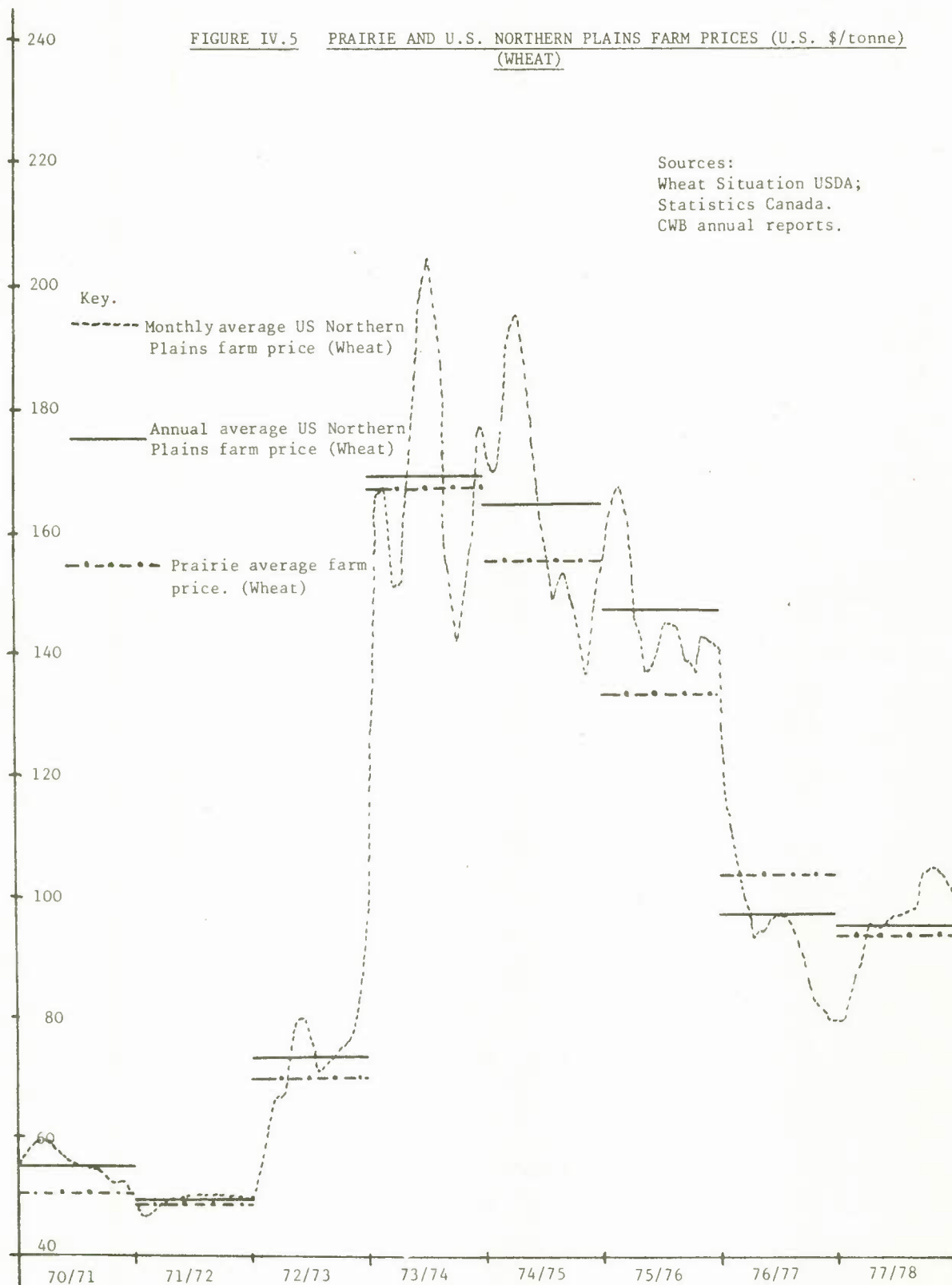
Figure IV.5 shows the monthly and annual average farm prices received in the Northern Plains of the U.S. for wheat, as recorded by the USDA, compared with the annual average farm prices received in the prairies. Prices are all in U.S.\$ to account for the effect of exchange rate fluctuations¹.

To the extent that U.S. prices are determined predominantly by domestic U.S. supply and delivery conditions rather than by world market conditions, one might expect that much of the traded volume would coincide with the lower rather than higher prices during the crop year.

1. Farm prices on each side of the border purport to measure the same thing, but they are not necessarily entirely comparable. The U.S. farm price series has been weighted by State sales, but the individual State average farm prices are often (e.g. North Dakota) not weighted by sales but are simple averages of elevator price quotations. Recently (1977), North Dakota has used sales to weight the monthly average prices but the annual average farm price is still unweighted. The U.S. price does not include any government support payments.

US \$/tonne

FIGURE IV.5 PRAIRIE AND U.S. NORTHERN PLAINS FARM PRICES (U.S. \$/tonne)
(WHEAT)



If so, then a simple average price will overestimate the sale volume weighted average price. However, accounts of U.S. farmer delivery behaviour do not suggest that domestic supply has been a dominant influence recently (see, e.g., I.W.C. World Wheat Reviews). Nor does this hypothesis accord very well with the characteristics of the U.S. market as a relatively open market, well serviced with grain exchanges and price discovery mechanisms.

Taken at face value the figure shows that the Northern Plains average farm price has generally been above that of the prairies, being above the prairies average for all of the last eight years except one, 1976/77, and averaging \$3.78/tonne above the prairies price.

Recent analysis of these same relationships between North Dakota and Manitoba specifically by Peltier and Anderson find similar patterns. Over the 1973/1975 period, Peltier and Anderson found that the U.S. 'premium' averaged \$12.00 per tonne. This period was characterised in the U.S. by little government interference and no direct support payments, though the U.S. farm prices used are net of direct subsidy payments. The Peltier and Anderson analysis also tries to take account of the slight protein content advantage enjoyed by North Dakota over Canada and concludes that between 1970 and 1976 this protein advantage was worth an average of \$5.1/tonne. This would, on average, place the recorded farm prices on either side of the border more or less on a par with each other. In fact, applying this average advantage to the prairie wide, northern U.S. plains comparison since 1970/71, only 1974/5 and 1975/6 show an adverse price relationship for prairie average farm prices.

The CWB realised prices at farm gate tend to be somewhat above the Statistics Canada average farm prices and these do show an average advantage over the Northern plains average farm price over the last eight years of \$4.34/tonne, only in 1974/5 and 1975/6 was the CWB 'farm price' lower than the comparable U.S. price.

Of particular significance in the comparison between the prices received at the farm is the fact that rail transportation is effectively subsidized in Canada under the fixed Crow rates. Based on prairie grain-rail cost estimates (Snively 1974 and 1977), the Crow subsidy amounted to \$13.1 and \$16.8/tonne for 1974 and 1977 respectively. One might expect that a major part of this subsidy should show up in a farm price advantage to the prairie farmers. The apparent fact that it does not (even when CWB 'farm prices' are compared with the U.S.) is worrying. Over the period 1970/1 to 1977/8 an average increase in realised CWB wheat pool revenues of 15 per cent would have been necessary to eliminate the adverse farm price differential when the Crow subsidy is included.

Table IV.2 shows the U.S. Canadian farm price difference per tonne and compares this difference with four of the major influences on the average price performance, the quality of the crop, the premiums for high protein, the level of Canadian exports and the level (or changes in the level) of wheat stocks.

TABLE IV.2 - U.S. versus Canadian farm prices (wheat) and factors influencing price performance

	1970/71	71/2	72/3	73/4	74/5	75/6	76/7	77/8
Canadian farm price minus U.S. (Northern Plains) farm price: \$/tonne	-5.13	-0.1	-4.5	-2.2	-9.6	-13.6	+7.0	-2.1
Quality of Canadian wheat crop, % of total grading 3 or poorer	23.2	7.0	25.0	18.0	61.7	35.0	9.0	55.0
Protein premium as % of Pacific Fob. Darn Northern spring price (14%) 15% over 14% protein	2.2	2.1	0.5	2.0	2.8	5.1	4.2	2.5
Canadian wheat exports as % of 1968/77 average	96	112	128	92	87	100	109	130
% Change in Closing Wheat Stock levels over previous year (Canada)	-27	-20	-38	+2	-21	0	+66	-9

SOURCES : CWB Annual Reports; USDA Wheat Situation Reports; I.W.C. World Wheat Statistics and author's calculations.

after their planned or scheduled arrival at port. No recompense to offset resulting demurrage costs etc. is provided within the current system.

b) Grain car turn round times and system capacity. Average grain car turn round times give an indication of the efficiency with which the current system is used. Current turn round times vary from an annual average of 22-23 days (Snaveley (1977)) to 16-18 days during peak movements (Booz-Allen). The latter report suggests that a practical objective, achievable on a regular basis, would be 13-15 days. Based on Snaveley (1977) data, the additional volume which could be moved through achieving a 14 day car cycle rather than a 17 day cycle is 5.1 m tonnes, (or an additional 11.4 m tonnes if the annual average car cycle time could be reduced from 22.5 to 14 days). The lower estimate of additional tonnage possible from reductions in turn round times exceeds the 'shortfall' in export volumes apparently experienced in 1977/78, while the upper estimate corresponds to the additional export potential projected for the mid 1980s, though new cars, among other capital investments, will be needed by the mid 1980s if the continued availability of rail cars is to be assured.

c) Mis-shipments. During three months at the end of 1978, 21 per cent of all shipments failed to meet prior specifications on grain, grade etc. (Booz-Allen). While most of these were relatively minor (a single grade out), these mis-shipments delay ship loading, reduce effective port terminal capacity, and cost money in terms of ship demurrage, sales contract penalties, or filling export orders in excess of requirements, and in the end damage to the reputation of Canada as a reliable exporter with consequent loss of future sales. Again, mis-shipments do not currently incur any financial penalty to recompense the primary exporter (the producer).

d) Elevator working hours. The lack of multishift working of terminal elevators and of weekend operation of country elevators, at least during peak times has often been criticised. The throughput capacity of the system could, no doubt, be improved if elevators were

used more intensively. However, there is currently little incentive or scope for recovering additional costs for elevator companies because of the regulation of tariffs, which denies the possibilities for differentiating tariffs between facilities or between different times.

e) Elevator tariffs and cost structure. Since the functions of marketing export grain are divorced from those of handling that grain, the private companies are forced to justify the costs and capital investment in plant and equipment purely from handling and storage charges with no opportunity, on Board export grains at least, to spread these costs over marketing margins. While this would not be of importance in the proper allocation of resources if the Board were to reflect changing market margins through premia and discounts to the handling system, the fact that the Board does not do this may mean that handling costs are higher¹ and investment lower than it otherwise would be. Certainly there is an apparent lack of willingness to invest in particularly terminal facilities by the trade without assistance from outside sources. Indeed the Board has recognised this problem through its incentive scheme to the trade (during the mid 1970s) to encourage expansion of West Coast (Vancouver) terminal facilities. (See CWB Annual Reports).

f) Conflict between Board and off-board/non-board markets. The interface between the CWB control over the grain forwarding system and the operation of the off-board and non-board markets generates considerable, though not easily documented, conflict because of the former's reliance on quantity control rather than the price mechanism. Car allocation, for instance, is carried out largely according to volumes to be moved rather than the value of the grain (or the difference between

1. North Dakota elevation charges averaged \$4.40/tonne in 1975 while Canadian companies charged between \$7.00 and \$8.00/tonne in 1974/5 and 1975/6. Again, however, such comparisons must be treated with caution. The two elevator configurations and cost structures are rather different, the Canadian system typically being one of smaller elevators dealing with more grades and more rigorous grading standards than its counterpart in North Dakota (see Candlish). This would explain part of the disappointing price performance referred to above.

the local prairie and port value). While wheat is often both a high value and high volume movement, this allocation procedure does sometimes penalise the movement of oilseeds, especially rapeseed to Vancouver, resulting in large premiums for spot rapeseed in Vancouver, costly trucking of rapeseed to Vancouver, and resulting in large margins between port and farm prices. Similar characteristics appear from time to time in the off-board barley market, where inverse price spreads on the Winnipeg futures markets and cash or spot premiums at Thunder Bay generate large margins and corresponding increased risk and uncertainty in the feed grain market both in the Prairies and in the feed using areas of Eastern Canada¹. An increased use of the price mechanism in the Board's operation of the forwarding system would allow these premia to be more accurately reflected back to the handling system and to the farm gate thus encouraging more appropriate delivery patterns and more economically efficient use of the scarce handling and transportation resource. The announcement of implementation of quotas for off-board grains for the 1979/80 crop year by the CWB was accompanied by the explanation that quotas would ensure equity of access to the, at times, very lucrative off-board market. But it is also consistent with the concern of the CWB to preserve the integrity of its export movement which can be, potentially, impaired if large parts of the forwarding system become committed to domestic feed grain movements.

iii) Conclusions

It would be churlish to suggest that all of the current problems in the G.H.T.S. and the problem of achieving satisfactory farm gate returns from the export market can be solved simply by introducing more price incentives and penalties into CWB marketing tactics. This course of action would clearly involve devolution of decision making from the Board to individual producers (itself not a costless exercise)

1. See Canada Grains Council (1979(b)).

and would also be contrary to established equity objectives (see below). The GHTS will always be subject to sporadic if not chronic shortage of capacity and the CWB will continually find its export sales strategy constrained by both the THTS and other external factors¹. In major part, too, an increased emphasis on the price mechanism has substantial implications for the Crow rate issue.

Nevertheless, the absence of incentives and the lack of monetary recompense for inefficient use of the system must be of some significance. "I see rigidity, controls inflexibility and a complete lack of incentive to those who are trying to do the job."²

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1. In 1977/78, when the GHTS severely constrained export movements according to the CWB (see Annual Report 1977/78), demurrage charges alone amounted to \$21.9m. Substantial additional costs in terms of contract penalties, lost sales, additional transport costs and so forth must also have been incurred. All of these costs will eventually be borne in producer prices received, or volumes moved to export. 1978/9 export volumes were also limited by transportation problems, though strikes and bad weather were the main causes (see CWB Annual Report 1978/79).
 2. R. Dawson, in discussion of "Marketing Strategies for Canadian Wheats". F. Hetland, Canada Grains Council (1978).

IV.4 Equity, Distribution and Stabilization Objectives of the CWB

These objectives have been stated as:

- To provide prairie grain producers with price stability, and;
- To ensure that each grain producer gets his fair share of the available markets each year.

(C.W.B., Information Department).

Broadly speaking, the price stability objective is achieved through the pooling of export receipts (price pooling) while the assurance of market shares is achieved through the quota system.

i) Stabilization

There are two major types of stabilization that the Board may attempt to achieve: intra-year stability and inter-year stability. While the objective explicitly concerns price stability, the CWB's primary concern with revenue maximization leads one to suppose that the Board may also be concerned with revenue stability.

a) Intra-year stability and price pooling¹

The price pooling system ensures perfect price stability within the crop year for grain sold through the CWB. However, since Board grains (wheat oats and barley) can also be sold for domestic, primarily feed, use on the off-board or open market, average farm prices are not completely stabilised through the year.

Maintenance of the financial integrity of the price pools means that the initial price must be insured, either directly through the insurance market, or internally through inter-year transfers in the CWB accounts or bank loans, or through a government guarantee. The last option is in fact used though has not been necessary in very many years (see Table III.4 above).

1. For a description of the price pooling mechanism see Section III above and Wilson (1978).

The major potential effects of price pooling can be identified as follows.

1. The lack of differentiation of prices received by delivery or sale date means that there is an incentive to deliver all export grain to the GHTS as soon as possible after harvest, thus avoiding storage and carrying costs on the farm. Although these costs will be incurred within the GHTS and will eventually be borne, pro rata, by all producers through the eventual final payment, these costs become external to the farm delivery decision.

2. The resulting pressure from immediate delivery to the GHTS (at least during periods of high export movements and rapid turn-over of stocks) gives rise to the need for a quantity (quota) restriction on deliveries. (Although quotas were not introduced at the same time as price pooling, the need clearly arose as a result of the pooling system, (see Wilson (1978) p.231 f and p.243-249)). Once established, this restriction on deliveries to the export market will have repercussions on sales to the off-board or open market. Ceteris paribus, the lower the opening quota levels, the more grain will be delivered to the off-board market and the lower will be the off-board price¹. The full ramifications of this relationship are beyond the scope of this report. However, it does seem clear that the establishment of the CWB initial prices and intra-year quota restrictions can have significant effects on the availability and price of off-board supplies. By the same token, conditions in the off-board market can determine the response of producers deliveries to changes in the CWB quota levels. This is likely

1. Other determinants of off-board deliveries will include total production levels, expected total annual deliveries to the Board, farm storage availability, cash flow constraints and the level of prices (spot and future) in the off-board market. One would suspect that the inverse price spreads and the lack of volume on the futures market for off-board grains is affected by these considerations and that the problems of the off-board pricing mechanism stem, at least in part, from the price pooling/quota arrangements for Board grains (see Canada Grains Council (1979b)).

to be more important for oats and barley than for wheat and would lead to less control over delivery patterns for these grains¹.

3. The lack of opportunities to exploit intra-year price variations and the associated regulation of sales of board grains have surely played a part in the increased production of non-board grains, particularly oilseeds and speciality crops, and to that extent these restrictions have affected the output mix of the prairie grains industry.

4. The pooling of all export receipts for a particular grain means that the premium currently achieved by the Board on West Coast exports is not reflected back to producers supplying the West Coast (Alberta and Western Saskatchewan), which has caused some to question the equity of the system. However, price pooling and the regulation of rail and elevator rates means that differential costs of servicing the West Coast movement are also not fully reflected at the farm gate. In other instances (e.g. designated or malting barley and the protein content of wheat) the original lack of price differentiation has been overcome by instituting separate price pools (barley) and by providing specific quality related premia in the final realised price (wheat). Differentiation is also provided between grades within each price pool (see Wilson (1978) p.279).

5. While price pooling does avoid relatively low prices for deliveries immediately after harvest, it does not avoid any resulting cash flow problems for producers since sale volumes have to be restricted (by the quota system)².

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1. This may act as a further incentive for the CWB to concentrate on the hard wheats where the effects of the off-board market are minimal and the predictability of farm deliveries in response to quota changes is likely to be higher.
 2. The Prairie Grain Advance Payments program was introduced in 1957 to overcome this problem. It advances money to producers (on a limited basis) prior to delivery of the grain to the CWB. It is administered by the CWB (see CWB Annual Reports) but is financed by the Federal Government who pay interest and administrative charges costing about \$5m per year.

6) The pooling mechanism obviously reduces the decision making and information gathering burden on individual producers. This, coupled with an increased degree of price certainty, may encourage production of board grains (in contrast to the possible discouraging effects above, though the certainty is offset to some extent by the restrictions on delivery through the quota). The information/decision burden is transferred to the CWB, who may be able to exploit significant economies of scale in this activity but must also ignore variations in individual circumstances and preferences.

Estimation of the total costs and benefits of price pooling is difficult. Taxpayers are currently paying \$5m per year to offset unsolved cash flow problems and are liable for the guarantee of initial prices, though neither expenditure is an absolutely necessary consequence of price pooling. Producers gain some insulation from market price variation, which may or may not be a net benefit to all producers, though some price variation may be transferred from the export sales to the off-board and largely unregulated sales. In other words, the 'profits' made by the Board in its selling operation, where profits in this case are gross revenues less marketing and administration costs, are shared equitably between producers. The CWB loses some flexibility in its marketing tactics (or incurs additional administrative costs in instituting specialised quotas and restrictions) while also incurring, on behalf of producers, the decision making and administrative costs of the mechanism itself. While the Board may gain more control over deliveries, this control is limited by the existence of the off-board market. It seems likely that at least part of the disappointing price performance of the CWB¹ is a consequence of reduced flexibility and lack of control over marketing tactics, which in turn results in part from the price pooling system.

1. At a maximum (including the effects of the Crow subsidy) this was estimated at about \$15 per tonne for wheat on average over the last eight years (15 per cent of gross CWB receipts per tonne), see page 77 above.

The disadvantages of price pooling are exacerbated by the simultaneous existence of the off-board market, so a re-instatement of CWB control over the domestic feed grain market would reduce some of these effects.¹ However, two significant questions remain. Can reductions in price uncertainty and risk be reduced in other, less disadvantageous, ways? Is a compulsory price pool necessary?

Perfect stability may be intrinsically attractive to some producers but others may not be willing to forego marketing opportunities provided by some variation. Open markets provide considerable scope for insuring or hedging against future price movements and typically provide some storage incentive to producers which would overcome some of the problems mentioned above. Given a preference for some form of Central Selling Agency, risk and uncertainty can be transferred from producers to the Agency through extensive use of forward contracts which would also overcome some of the cash flow problems. The agency itself can again transfer this risk by either selling grain on long term contracts as the CWB currently does, or by hedging its own purchase contracts in world grain futures markets. Thus alternatives do exist to reduce the risk and uncertainty of price fluctuations facing producers. These alternatives do not involve the necessity of quantity restrictions on deliveries. They do allow producers the freedom to choose the timing of sales (and hence the extent of their storage and carrying costs, and the degree of risk they wish to accept) in the light of seasonal price variations and their individual circumstances and preferences.

Nevertheless, some producers may prefer the price pooling system to these alternatives. The usual argument against voluntary pools is that sales will only be made through the pool when alternative prices are low relative to the pool (initial) price. Thus the pool will always tend to provide lower average returns than the open market.

1. Though this would also re-introduce the problems of the domestic feed grain market experienced prior to the introduction of the New Feed Grains policy (see Harvey 1977) and Canada Grains Council (1979(b)).

Compulsory pools overcome this problem. However, there does not seem any reason in principle why membership of a price pool could not be made a legally enforceable contractual obligation. Producers who joined would be required to make all of their sales through the pool (or a given volume of sales through the pool), the timing of deliveries to be determined by the managers of the pool in the light of sales opportunities. Such a voluntary pool could be run by the CWB, as now, or in principle could be run by the Grain Co-operatives (the Wheat Pools etc.) or by independent organisations¹.

In principle, there does not seem to be any reason why voluntary but contractual pools should not co-exist with other purchasing systems, or why participants should not derive as much benefit from such a pool as they do from current compulsory pools. The only question is whether there would be enough takers². The answer has obvious implications for the continuation of the current pooling system and for the concept of equity embodied in that system.

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1. This might involve changes to the current CWB legislation which prevents the sale of export grain other than to or through the CWB. Although quasi independent pools could possibly be made CWB purchasing agents since eventual sale would be through the CWB if the Central Selling Agency regime is maintained.

In terms of ease of introduction, the option of increased use by the CWB of contract purchases from producers (already used for utility wheats) and spot purchases alongside voluntary pools would probably be preferable. While contract and spot purchases might place an increased decision making burden on the Board, the basic information on, e.g. farm storage and carrying charges, other sales opportunities and so forth must already be available to and used by the Board in setting quota levels. The additional discipline imposed on these decisions by active purchasing from producers might be seen by some as a useful spur to successful marketing by the CWB. It should be noted that the principle of equitable distribution of profits made by the CWB and be retained without price pooling simply by distributing surpluses according to deliveries to the Board. Deficits would have to be accumulated and transferred to future years accounts. Again this would impose some extra discipline on the Board in response to producer/shareholder interests.

2. There is now a legislative base for a rapeseed pool, should sufficient producers be interested. This has failed to generate any real support, even against an alternative of the free enterprise market rather than CWB forward contracts and spot purchases.

b) Inter year stabilization and the Western Grain Stabilization Act

The potential for the CWB to stabilize prices and, more importantly, revenues for export grains through its stock-building and sales strategy has already been dealt with, and it has been concluded that the scope is extremely limited¹.

The introduction of the W.G.S.A. in 1976 effectively removes any onus from the CWB in this respect in any event. The mechanics of this program have already been covered (pages 33-37), where it was seen that it contains a substantial taxpayer contribution (\$50m per year or \$330 per permit book holder). Examination of the potential benefits of this program is warranted by this order of current and sustained government intervention.

Appendix 1 to this section details, on an illustrative basis, the effects of the W.G.S.A. had it been in operation at a 100 per cent participation rate over the period 1971 to 1978. This is not, perhaps, a very representative period over which to examine the plan. It would, for instance, have generated a surplus on the stabilization account of almost \$7,000m². As expected, the plan produces significant payouts when net grain receipts fall (1977 and 1978). The combination of contributions (levies) and payouts does dampen fluctuations in net receipts from grain production. The overall reduction in variation is marginal in this example (the coefficient of variation is reduced from 0.33 to 0.32, an insignificant change), though it would be substantial were there to be a succession of years of falling net receipts and sufficient payouts to remove the surplus.

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1. See pages 20, 21 and page 57 above, and also the Task Force.
 2. In fact, the provision exists in the Act for altering producer and government contributions in the event of substantial surpluses or deficits accumulating. This provision has not been incorporated in this example.

The major potential benefits of the plan are:

- i) more economically efficient or increased output of grains due to reduction of risk of production;
- ii) elimination (or significant reduction in the possibility) of catastrophic losses due to prairie wide weather, disease or pest circumstances or world grain price collapse;
- iii) more stability to grain net incomes through net cash flows and hence more stable farmer purchasing and spending patterns influencing the stability of the rural, western, and possibly national economies.

Estimation of the production effects of a reduction in risk is notoriously difficult. In theory, (see e.g. Blandford and Currie) one would expect a reduction in risk to increase production. One might also expect that the reduction in risk would affect the supply of credit either through volume and/or through interest rates charged, hence reducing this cost. In fact the W.G.S.A. has not been in operation long enough, nor have its effects on the reduction of risk been substantial enough to allow any measurement of the possible output response. Since prairie grain production is a risky business in any event, one would expect the risk-aversion displayed by those engaged in grain production to be rather low and one can legitimately ask how their decisions might be affected by a reduction in risk. To the extent that there are less risky production alternatives to grain production available, one might expect some resource re-allocation towards grain production. This is true for only a relatively small part of the prairie agricultural area. For those committed to grain production because of a lack of alternatives, one could expect more intensive grain production (with higher cash expenditure on fertilizers, herbicides, pest and disease control measures and perhaps less summer fallow acreage). However, the reduction in risk would need to be substantial to observe any significant increase in production intensity, particularly since the production of grain has not, in the past, guaranteed the ability or opportunity to sell grain.

To obtain an increase in value added by grain production (gross receipts less cash expenses - roughly equivalent to the resource cost to the rest of the economy) sufficient to offset the taxpayers contribution (4 per cent of gross grain receipts), an increase in production of the order of 10 per cent would be necessary, assuming no final output price changes. Some production response is possible, but it is unlikely of itself to be sufficient to justify the taxpayer contribution.

Reductions in the possibilities of catastrophic losses, apart from providing a significant non-economic benefit to producers, may also ease the credit market and make credit cheaper and more readily available. This could augment the supply response somewhat, through increased capital intensity.

The most important benefit from the point of view of the economy as a whole is the potential of the plan to smooth the level of economic activity generated by grain production and thus improve the stability of the economy as a whole¹. Since grain production is a major part of the western agricultural economy, and the latter forms a significant part of the western economy as a whole, the potential macro-economic stabilizing effect of W.G.S.A. is likely to be significant. Since a direct drain on the public purse in support of the stabilisation plan will only occur when there is a payout from the fund, the plan works in much the same way as the general fiscal stabilising system of budget surpluses and deficits.

In conclusion the W.G.S.A. has been designed so as not to disturb the long run price signals for resource allocation within the agricultural industry (through its relation to the five-year average net grain receipts). It seems potentially capable of generating economic

1. It seems possible that increased stability of input demands from agriculture might encourage suppliers to respond to changes in those demands through increasing supply rather than, as can be the response of oligopolistic industries, increasing prices. This would improve the efficiency of resource allocation.

advantages within grain production and the agricultural supply industries, and of generating more stability in the western economy, which outweigh the cost of resources withdrawn from the economy through the taxpayer contributions. Since the programme also includes an element of re-distribution from the taxpayer to the grain farmer, it might also be justified on overall distributional grounds given that grain farmers are regarded as deserving recipients of public financial support.

ii) The quota and production practices

The effects of the quota system on the control and flexibility of the grain forwarding system, and the fact that it is a necessary part of a compulsory price pooling system, have already been covered (pages 82, 83 and 89). The effect of the quota on production practices remains to be examined and is potentially very important.

The major effects of the quota are restricted to those times when quota levels are binding throughout the crop year and remain 'closed' (i.e. limiting deliveries) at the end of the crop year. These circumstances arise through one of two major factors: a) the Board is actively restricting the sale of the total Canadian crop for some reason; or b) the grain handling and transportation system is not capable of moving all the grain that the CWB and open markets would wish to move. While the two causes of the quota limitation are in principle quite different, the general effects of the resulting tight quotas are the same.

The simple analytics of a tight annual quota level (which restricts total crop-year deliveries to less than the disposable production from farms) are examined in Appendix II to this section. This analysis demonstrates that effective quotas restrict production and result in the more extensive use of land. A significant part of the

total crop acreage of Western Canada is summer fallowed¹. The comparative-static analysis of the quota helps to illuminate the nature of this summer fallow acreage as being made up of three major elements:

- i) required by sound technological management to conserve moisture and nutrients;
- ii) evidence of extensive use of land through the substitution of summer fallow for fertilizer and weed control chemicals, etc., witnessed by the higher yields obtainable from summer fallow compared with stubble crops;
- iii) simply 'idle' land, used to generate the ability to deliver grain rather than to produce it. The land is not disposed of because it is valuable as a licence to deliver grain (in the same way that low quality perennial forage is also valuable under the current system).

To the extent that tight quotas are caused by an insufficient capability of the G.H.T.S. to store grain, reducing production levels is a sensible short-term response. If the quotas are tight because the Board feels it to be in producers interests to delay sales until future crop years, then to the extent that producers are in agreement with the Board (i.e. to the extent that producers storage and carrying costs have been taken into account by the Board), then the production disincentive will be minimised. If quotas are tight because of national adherence to an international grains agreement then it may well make sense to restrict production as well as build stocks. By itself, restricting production may not be a bad thing. The way in which production is restricted, however, does have some disturbing characteristics from a resource-allocation point of view.

1. Currently about 34 per cent of the total grain acreage (seeded acres plus summer fallow) is summer fallowed. Thus the 'average' rotation is 1/3 summer fallow, 2/3 crop. This can be compared with a 1/4; 3/4 rotation in North Dakota.

The use of summer fallow as a technologically sound management practice has been disputed by agricultural scientists for some years¹. There seems little doubt that, other things being different, summer fallow would not be required to anything like its current extent simply on the grounds of good management, rather it would be avoided in the interests of soil management and conservation. If this is the case, then it seems likely that a large proportion of potentially damaging summer fallowing is being done for economic and not technological reasons. While part of the economics of summer fallow has to do with producers own expectations about grain prices this year versus next², a substantial part of the economics of summer fallow is, at least in principle, tied up with the operation of the quota.

Furtan and Lee suggest that the quota leads to extensive use of land, low adoption rates for new, high yielding varieties (and perhaps less emphasis on the development of these varieties in the first place), low use of fertiliser and chemicals, and will in general lead to non-adoption of land-augmenting capital. There is no incentive to increase output per acre. (It is, then, not surprising that Canada's share of the world export market has not been increasing very fast)³.

The lack of distinction between varying productivities of land has often been criticised as a failure of the quota system to maintain equity. The most recent review of the quota mechanism apparently recommended⁴ that the acreage basis for the quota exclude perennial forage and summer fallow and be based exclusively on seeded acres to

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1. See Rennie in Canada Grains Council (1978) for a recent discussion.
 2. See Zentner et al.
 3. Furtan and Lee also suggest that the quota system, reinforced by labour/capital price relatives, have contributed to increasing farm size, increased land values and rural depopulation in Western Canada.
 4. Carried out by the Advisory Committee to the CWB, but not yet made public. The CWB Annual Report 1978/9, refers to this report (p.31) and details the changes made to the quota arrangements. Apart from including off-board deliveries in the quota system, no other significant changes have been made.

the six major grains. It also recommended that 'bonus' quota could be earned by producers who were consistently constrained by the average quota per seeded acre. Such a process would enable both more productive farms and more productive farmers to increase their delivery opportunities relative to the average, and thus reduce the existing 'equity' of the system. These recommendations (which would both have removed some of the disincentive to production) have not yet been accepted, largely because with the existing G.H.T.S. constraint, there seems little point in encouraging production, but also one might suspect because of the vested interest in the status quo (capitalised in land values).

Quantification of the production effects of the quota system is bound to be tentative. Based on MacLaren's analysis¹, an additional 5m tonnes of wheat would be produced if average quota levels were increased from 90 per cent to 100 per cent of total available supplies. Rennie, on the other hand, suggests that total production (using more fertilizer and less summer fallow) could be increased by more than 20m tonnes. Open quotas on an annual basis would eliminate the above effects providing that it became generally expected that quotas would remain open on a continuing basis. Nevertheless, continued use of the quota system to schedule deliveries through the crop year would always carry with it the possibility of closed quotas at the end of the year and it seems likely that the assurance or even guarantee of year end open quotas would not be sufficient (except in the very long run) to encourage production to its maximum potential.

It seems clear that not only does the quota effectively and directly restrict production and thus the Canadian exportable surplus significantly, but also helps to condition the production environment towards extensive (and possibly damaging) land use patterns, and away from intensive production practices which would be necessary to fully

1. MacLaren's model is based on past responses to changes in quota levels, which is not quite the same thing as elimination of the quota system.

exploit western Canada's grain growing potential. The existence of continued open quotas will not necessarily remove the indirect conditioning effect.

Any movement away from the current status quo will potentially damage the interests of those areas with relatively low productivity and few opportunities to grow high yielding feed grains or utility wheats. These areas can, therefore, be expected to resist change on the grounds that it is inequitable. The elimination of quotas and reliance on the price mechanism would, as would elimination of the price pooling mechanism, place more of a management and decision-making burden on farmers which they may not be immediately willing to shoulder (especially since the G.H.T.S. does not currently allow full exploitation of the potential benefits). On the other hand, those with the more highly productive land, or with the interest and willingness to innovate, adapt and manage the farm business efficiently and effectively under current or changed circumstances, have reason to believe the current quota system to be inequitable since it does not allow their farm's superior productivity to be reflected in their ability to deliver grain.

The guarantee of equity (or equality) in accessibility to the grain forwarding system is not, of course, an end in itself. It is the right to revenues from the sale of grain, traditionally only obtainable upon delivery of grain to the elevator system, which is the ultimate objective of equitable access. Even under the current system, 'equitable access' has evolved to such an extent that the quota deliberately discriminates between grains, grades and protein levels and even between regions (shipping blocks) during the crop year so that equity has long ceased to be equivalent to equality of access. By the same token, it has not resulted in equality of incomes.

For the Board to control deliveries to a full forwarding pipeline, without quotas, storage premia and forward contracts would need to be used, perhaps extensively. The use of such storage premia, which may on occasion need to be substantial, plus the use of forward

contracts perhaps including pre-payment to producers for at least part of the value of the contract, would involve the CWB in a much larger short-term debt to the farmers it represents than under the quota. To that extent it would make explicit the cost of the plugged system rather than leaving it implicit as it is at present (being borne by producers in unrewarded farm storage of undeliverable grain or discount sales to local (i.e. non GHTS using) uses). Such a mechanism would also allow the Board to make explicit decisions on the value of incentives and penalties to the GHTS itself to encourage more efficient use of the system and, as will be seen in the next section, provide the Board with some explicit guidelines on the extent to which producers should be contributing to new investment and extended capacity in the forwarding system, (which pre-supposes a distinct change from the current financing or non-financing of rail grain transport).

Nevertheless, while the prairie grains industry continues to suffer from an outdated and inadequate grain handling and transportation system, and while this system continues to be guided and used according to rules and mechanisms other than the price mechanism, abandonment of the quota and substitution of more price signals for delivery of grain would be to put the cart before the horse. The quota is needed because of the inadequacy and shortcomings of the rest of the grain marketing system. The quota mechanism could be beneficially altered so as to allow increased quota allocations to more productive farms but cannot usefully be eliminated until and unless the incentive mechanisms (through price) are built into the grain forwarding system and until and unless this system is given the financial freedom to respond to these incentives.

It is to this question that the next section turns.

V THE GRAIN HANDLING AND TRANSPORTATION SYSTEM

V.1 Introduction

The current status and performance of the grain handling and transportation system (GHTS) are dominated by the twin issues of rail rate regulation and system throughput-capacity. The examination of the CWB in the last section concluded that the lack of emphasis on the price mechanism may discourage the most efficient and flexible use of the GHTS, and thus the achievement of maximum revenue for export grain sales, and also may discourage the full exploitation of Western Canada's grain growing potential.

In the current situation, however, these considerations are of secondary importance compared with the constraints imposed by and through the GHTS. Furthermore, the regulation and intervention in the GHTS involves considerable public support and subsidization (see Section III.4 above) so that the taxpayer interest in the effective use of these public monies gives these issues wider importance¹.

The major elements of intervention and regulation in the GHTS can be isolated as : i) the Crow rate; ii) the regulation of branch line abandonment; iii) the public provision of capital grants and subsidies². The Crow rate is shorthand for the set of rail rates fixed by statute (The Railway Act) for the movement of grain and

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1. Taxpayer involvement in the CWB regulation complex is relatively minor. The issues mainly concern the grain producer and grain trade with only second round effects on other areas of agriculture and the rest of the economy.
 2. This classification ignores the regulation of the elevator and grain handling complex. While this is considerable in absolute terms, through the Canadian Grain Commission, its effects are of secondary importance relative to rail regulation.

grain products (excluding oilseed products) to export position. Regulation of rail rates through the Crow is absolute. At least recently, however, this regulation has also resulted in a significant element of implicit subsidization, because the Crow rate is not sufficient to cover rail costs¹. Control over the disposition of unprofitable branch lines (most recently through the Hall Commission and the Prairie Rail Action Committee) stems from the potential ability of the railway companies to dictate the rail configuration and levels of service in their own interests, and the need for some protection of the general public interest against this monopoly power, and explicit recognition of externalities involved in railway decisions. This protection also involves significant subsidization, explicit and from the public purse in this case. In part as a consequence of this regulation, coupled with insufficient levels of subsidization, capital replacement and investment needs are not being met from within the industry and there are significant and growing demands for public grants.

The resulting transfers of responsibility, authority and money between producers, railways (and grain handling companies) and taxpayers are the subject of this section². Section V.2 deals with the implications of the Crow subsidy (Crow gap) for producers and production decisions in Western Canada. Section V.3 turns to the effects of regulation both of rail rates and of rail configuration³. Capital considerations are dealt with in Section V.4 and finally some broad proposals for a possible future direction are offered (Section V.5).

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1. Since it has taken more than 40 years for this situation to develop it is hard to argue that subsidization of rail movement of grain was an initial intention of the statutory regulation of rail rates. Rather this element has appeared by default rather than conscious policy decision.
 2. The section draws heavily on previous work by the author (Harvey (1980)) and the interested reader is referred to this for the underlying analysis. This report will concentrate on the conclusions and implications.
 3. This part also includes some comment on the regulation and control of elevator configuration.

V.2 The Crow Subsidy

The Snavely Commission has established, with the broad concurrence of the railways and the provincial governments, that the statutory rate revenues are not sufficient to cover the costs of moving grain by rail from the country to export position. The original 1974 estimates of rail costs and revenues (Snavely (1976)) have been updated to 1977 (Snavely (1978)) and the results are shown in Table V.1.

TABLE V.1 - Costs and Revenues for the Transportation of Statutory Grain by Rail, 1974 and 1977
\$m and \$/tonne

	1974		1977	
	\$m	\$/tonne	\$m	\$/tonne
Total Cost	234.4	12.55	354.0	15.4
Statutory Rate Revenues	89.7	4.80	114.8	4.90
Gross Revenue Shortfall	144.7	7.75	239.2	10.23
Federal Government Payments (branch line subsidies)	55.4	2.97	63.7	2.72
Railway shortfall	89.3	4.78	175.5	7.50

SOURCES : Snavely Commission Report, Volume I (1976) and Report by Snavely, King and Associates to Transport Canada, September 1978.

By 1977, the gross revenue shortfall (or Crow gap) amounted to \$10.23 per tonne. Part of this gap is made up by federal government subsidies, but the balance is made up (implicitly) by the railways through foregone investment and depreciation and lower operating surpluses over all rail operations, and lower shareholder returns¹.

1. Including, in the case of C.N., lower operating surpluses accruing to government. There is also the possibility of some cross subsidisation of grain by other traffic within the rail operation.

This implicit subsidy: (i) affects resource allocation within western agriculture and related industries; (ii) has implications for future government financial involvement in the grain rail system; and (iii) has implications for the current wealth distribution within prairie agriculture¹.

i) The Crow gap and resource allocation

The Crow gap is essentially subsidizing the export of raw (unprocessed) grain off the prairies. This means that, given an export price for grain at export position, the price received by producers for exported grain is higher than it would be in the absence of the subsidy. Since the export market is the major market for prairie grain, local Western Canadian users of grain (oilseed processors and livestock producers) must compete with the price received for exported grain and hence must pay a higher price than they would in the absence of the subsidy². This higher price for grains discourages further processing and livestock feeding in Western Canada and erodes the competitive position of grain-fed animal agriculture in Western Canada vis a vis the U.S. and Eastern Canada. Furthermore, as rail costs escalate while Crow rates stay constant, this discouragement is increasing through time.

Against the costs of the Crow rates, there is the clear income benefit to grain producers in Western Canada derived from the subsidy. Sudden, or even gradual, removal of this subsidy (or closing of the Crow gap) will obviously damage the income position of these producers and, for that reason alone, cannot be expected to be especially attractive.

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1. The Crow rate has additional ramifications to do with regulation of rates and with capital investment in the grain rail system. These will be dealt with later in this section. It also has wider overtones to do with more general issues of economic development, regional income distribution and transport regulation which are beyond the scope of this report. (See e.g. Harvey (1980) and references there.)
 2. Complicating factors such as the slope of the export demand function for western grain and the existence or absence of limiting marketing quotas qualify this logic but do not deny its basic conclusion.

The consequences of the Crow gap (isolated by considering the effect of eliminating the gap through higher rail rates paid by producers) can be considered as income effects or as effects on output from the Canadian, primarily Western Canadian, economy.

a) Income effects

The impact¹ of an upward revision in grain-rail rates to rail cost covering levels would result in a net income loss to western agriculture of approximately the size of the gross revenue shortfall or Crow gap. The net income impact (grain income losses less income gains for existing western Canadian livestock production) will be greater for those regions heavily dependent on marketing raw grain (The Palliser triangle and Saskatchewan) and smaller for those regions with more mixed production patterns (the park belt; Alberta and Manitoba). As adjustment to the changed grain prices occurs, so grain gross income will be further reduced as production is reduced, while livestock gross income will increase as production expands in response to lower farm prices for grain. The gain in livestock income is unlikely to be sufficient to offset the decline in grain income in aggregate, nor in the straight grain producing areas (Saskatchewan), though it well might be in those areas with greater potential for livestock expansion and with a relatively larger current livestock base (Manitoba and Alberta).

Removal of the Crow gap would, of course, increase railway revenues and eliminate the current and future Federal Government (taxpayer) commitment. The impact of the change would result in a balancing of Western Canadian income losses with railway and taxpayer gains. When the adjustment effects are included, however, total income

1. A distinction is made between the impact of the hypothetical change, which simply accounts for the immediate consequences without any change in production patterns etc. and thus corresponds to Josling's Producer Subsidy Equivalent (Josling (1980)), and the effects of the change, which take account of adjustment of production etc. to the initial impact.

increases to the extent that livestock income increases resulting from expansion exceed grain income losses from production contraction. That this final income change will be positive is clearly established by received economic theory and is borne out by quantitative estimates and evidence. It also leads directly to the second consequence of the Crow gap.

b) Real final product (output) effects

Removal of the Crow gap would reduce the quantity of raw grain exported from Western Canada (through a fall in production and an increased use of grain for feeding livestock and for secondary processing). It would increase the quantity of red meat and processed grain and oilseed products produced. The real final product implication of the change is the difference between the value of the reduced grain exports and the value of the increased livestock output. The greater expansion of livestock production relative to the fall in grain production and the greater value of livestock versus raw grain means that the real final product increases. In other words, the current subsidy results in a loss of real output from Western Canadian agriculture¹.

c) Nevertheless the income consequences of a change in rail rates are obviously significant for Western Agriculture, particularly in Saskatchewan (as reflected in that Province's concern about the possibility of a change). The question is clearly raised as to whether there is a way of avoiding or minimizing these income consequences without incurring the real final product (i.e. economic growth and development) consequences outlined above. This question is returned to below (V.5).

Tables V.2 and V.3 summarise the results of quantitative estimation of these effects, though the reader is warned that those figures can only be regarded as ball park estimates. Full explanation and qualification is given in Harvey (1980).

1. Estimated in Harvey (1980 at between \$25m and \$100m per year in 1978 \$. When increased value added from the secondary industries is included, these figures increase to between \$65m and \$170m per year.

TABLE V.2 - Estimates of Income Changes Resulting from an Increase in Rail Rates on Grain from Crow rates to Cost Covering Rates (1978 \$m)

	Grain Production	Livestock Production	Total Agriculture	Secondary Industry*
Manitoba: Impact	-39	+18	-21	
Adjustment	-1	+23	+22	
Total	-40	+41	+1	
Saskatchewan: Impact	-168	+28	-140	
Adjustment	+2	+41	+43	
Total	-166	+69	-97	
Alberta : Impact	-116	+44	-72	
Adjustment	-12	+64	+52	
Total	-128	+108	-20	
Western Canada (including BC):				
Impact	-326	+100	-226	+226
Adjustment	-12	+135	+123	+48
Total	-338	+235	-103	+274

SOURCE : An analysis of the Crows Nest Pass Rate. D.R. Harvey, (1980).

* Secondary Industry includes grain handling and processing, meat and livestock processing and transport, railways and the Federal Government (assumed in the analysis to benefit through elimination of the implicit Crow subsidy).

TABLE V.3 - Estimated Real Final Product Changes Resulting from
an Increase in Rail Rates from Crow Rates to Cost
Covering Rates (1978 \$m)

	Western Canada (inc.B.C.)	Manitoba	Saskatchewan	Alberta
Grain Production	-102	-16	-24	-57
Livestock Production	+200	+34	+61	+95
Total Agriculture	+98	+18	+37	+37
Secondary Industry	+74			
Total	+172			

SOURCE : As Table V.2

- NOTES : 1) These estimates are significantly higher than other comparable estimates, see Harvey (1980). The total real final product change has been estimated at between \$65m and \$172m per year, while the balance in agriculture has been estimated at between \$25 and \$98m per year.
- 2) The potentially significant increase in livestock production means that the net effect of the hypothetical change on the Canadian balance of trade is likely to be positive. Reduced imports and increased exports of meats and livestock would be expected to outweigh, in value terms, the fall in raw grain exports following the change.
- 3) Because of the relatively open North American market in meats, the consequences of the change for consumer prices would be marginal and would be restricted to those instances when the direction of trade in meats is changed from the base position (see Harvey (1980)).

ii) Future trends in the Crow gap

Because the Crow rates are fixed in absolute terms, and because rail costs escalate as rail input costs rise, the Crow gap is tending to grow over time. Export volume changes, the efficiency with which the rail system is used, and the rate of cost escalation will all affect the size of the gap in the future. Based on a constant rate of cost escalation (6 per cent per year) and ignoring any cost savings resulting from improved efficiency, the implication is that the Crow gap (\$/tonne) and the gross revenue shortfall will increase substantially in the future (see Table V.4)¹.

Two important points about this gross revenue shortfall should be noted. Firstly, it represents according to Snively the break even amount necessary in order to maintain the 1977 rail system in an ongoing state at existing loading levels etc. Unless the railways receive this money from some source other than internal railway revenues, they will continue to run down the rail system, avoiding maintenance and capital investment. Thus one would not expect the pure status quo policy to result in a system capable of moving the projected growth in exportable surplus. The second point follows directly. Maintenance of the Crow rates at their current level, and maintenance of the existing (1977) rail system in a non-depreciating (albeit run down) state will require a federal government subsidy equal to the gross revenue shortfall².

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1. The exportable surplus projections are derived from linear production trends and constant feed, seed and industrial use (at 1972/1976 average levels). These estimates are very similar to other projections, see Section II.4, and ignore potential increases due to wider adoption of utility wheats or to possible changes in the application or principle of the quota system (see Section IV).
 2. Even given this, there is no guarantee that the system will be able to move projected exportable surpluses in the future because of the depreciated state of the current system. Some capital rehabilitation is also needed and the returns to justify this expense will be additional to the gross shortfall estimated here.

TABLE V.4 - The Crow Gap, Gross Revenue Shortfall, and Income Impacts, Past and Future (1978 constant \$)

	Exportable Surplus (m tonnes)	Crow Gap (\$/tonne)	Gross Revenue Shortfall (\$m)	Income Impact ² (Loss) (Agriculture) (\$m)	Grain Producers ³ Net Cash Income Loss (\$m)	Gross Grain Income Loss ⁴ (\$m)
1972/1976 ⁵	19.4	10.8	210	226	245	326
1976	25.8	9.0 ⁶	232	249	264	346
1977	23.8	9.9	236	254	271	361
1978	24.4	10.8	263	284	302	400
1980	24.4	11.4	278	300	320	423
1985	28.1	12.5	351	375	396	509
1987	30.3	12.8	388	411	433	549

NOTES : 1. Gross Revenue Shortfall is calculated as the Crow Gap 'Exportable Surplus'. To the extent that the latter does not correspond exactly to statutory rate movements this will overestimate or underestimate the actual Gross Revenue Shortfall experienced historically (assuming the accuracy of the 'Crow gap' estimates used here, based on minimum compensatory rates (Snaveley (1976)) and escalated through a 6 per cent cost escalation per year.

2. 'Income Impact' corresponds to the Western Canadian agricultural impact figure in Table V.2 (1972/76).

3. 'Grain Producers Net Cash Income Loss' is a crude approximation based on Gross grain income loss (see note 4 below) less seed use and home farm use of grain cost savings. The home farm use is approximated by total feed use less an assumed 1.7m tonnes (37.5m cwt) sold off farm for local feed use in Western Canada. Both seed and home farm feed use are held constant at average levels.

4. Gross Grain Income Loss equals Production * Crow gap.

5. This row corresponds to the Western Canada Impact row of Table V.2.

6. The Crow gap for 1976 is interpolated from the 1977 and 1974 (Snaveley Volume I) estimates.

iii) The Crow gap and grain producer incomes and wealth

Elimination of the Crow subsidy would clearly reduce prairie grain farmers incomes and income expectations. To the extent that these expectations have been built into past decisions, particularly the decision to buy land and be a grain farmer, this elimination would impose a real economic loss on existing producers. In this respect, elimination of the existing, albeit implicit, subsidy has consequences which are qualitatively different from a decision to introduce a new subsidy.

The current Crow subsidy, ignoring the possibility of its escalation in the future, if completely capitalised into land values, would amount to \$40 per acre on average¹. A more sophisticated estimate can be derived on the basis of previous research into land price formation in Western Canada (MacMillan et al), which suggests that if the (constant) 1978 Crow gap had been fully reflected in land purchase decisions, land prices would fall by about \$30 per acre after full adjustment in the land market if the subsidy were removed².

Since for many farmers their land holdings are their retirement or pension funds, such a potential capital loss (of 18-22 per cent on average) is clearly important.

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1. The present value of a future stream of Crow subsidies (at \$220m per year) over 20 years at 10 per cent is about \$2.0 billion. 24.4m tonnes of exportable surplus grain production at average yields, including summer fallow, would use 50m acres. The value of the subsidy under these assumptions is \$40 per acre.
 2. Setting the change in total cash receipts equal to the Crow gap of \$10.25 per tonne (1978) in MacMillan's land price equation (Appendix IV.1) gives a short run effect on land prices of \$4.2/acre, rising to \$30.0 per acre in the long run. (\$10.25/tonne is equivalent to \$6.6 per acre at current yields and summer fallow levels. About 25 per cent of this will be rent. The interest rate used in the equation is 9.5 per cent, the FCC loan rate in 1978).

These figures are averages across the whole Prairies. However, rail rates, if changed from the Crow levels, may well change more for longer than shorter hauls, since the schedule of rates with respect to distance is very flat, and may also differentiate between branch lines and main lines (probably should in the interests of economic efficiency). Alternatively, individual producers may be faced with substantial increases in trucking costs if nearby delivery points and lines are closed. While the average increase in cost following a change from Crow rates to minimum compensatory rates is about \$10.2 to \$10.7/tonne, a possible range around this average is from \$2.0 to \$20.0 per tonne¹. The redistribution of income (and wealth) among producers following such changes (which are or would be largely a result of public policy decisions), if there were to be no compensation, is obviously quite significant.

Nevertheless, it should be remembered that, unless the railways receive adequate revenues from some source, export volumes are likely to fall and so too will grain revenues. Particularly vulnerable to a lack of rail export capability are the branch lines which would continue to consume railway revenues greatly in excess of their ability to earn those revenues. In this sense, the default public policy (do nothing other than what is currently being done) will result in falling grain revenues and consequent declines in asset values and wealth of Prairie grain farms.

It should also be noted that the W.G.S.A. program, because it operates on farm gate receipts, will have the effect of phasing in any change in rail rates, at least on average, over a five year period and that this phasing will apply not only to an initial change from

1. The range results from consideration of possible cost related main line/branch line rate differentials, higher rates for longer rail hauls, and increased trucking costs associated with branch line abandonment. (See Harvey, 1980).

the current Crow rate but also to any subsequent change in rail rates, at least insofar as the plan is making payments. Any increase in the rates will increase the likelihood of W.G.S.A. payments.

Many factors will influence the extent to which the current Crow gap and its expected continuation have been capitalised into the wealth structure of individual grain farmers. The precise nature of any policy change will influence the degree of capital loss suffered by existing land owners. Exact quantification of these effects is not possible. Nevertheless, the effects must be explicitly recognised and compensated for in any future policy change. The case for compensation is an economic one as well as being politically and socially desirable.

V.3 Regulation of the GHTS

The arguments of V.2 above were concerned with the substantial element of subsidization implicit in the Crow rates. These rates, however, also regulate the railways. In addition, the railways freedom to abandon branch lines is closely regulated, as are the tariffs which can be charged by elevator companies for grain handling¹.

The issue of regulation raises the familiar conflict between the efficiency of the unregulated price mechanism and the control of externalities associated with local or regional monopolistic industries.

(a) Potential efficiencies

The greatest opportunity for cost saving within the GHTS system is to spread the fixed costs over a larger volume of grain. Elevator and rail capital costs, plus a significant proportion of labour and certain other current costs, are virtually invariant with volumes moved within certain unspecified overall capacity constraints, and thus are fixed costs. The spreading of these fixed costs over larger volumes can be achieved through encouraging greater throughput through the system as a whole (which undoubtedly accounted in part for the fact that rail costs between 1974 and 1977 did not increase in per tonne terms as much as general cost escalation would have led one to expect), and by reducing the level of fixed costs (elevator consolidation and higher throughput/capacity ratios, and branch line abandonment).

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1. In addition, the establishment of grades and grading standards also effectively acts as a regulation device. The question of whether the additional costs imposed on the handling system by the multiplicity of grades and categories of quality are more than offset by the marketing benefits is an interesting one but is deemed beyond the scope of this report. Lest anyone think that the Canadian system is over-regulated by international standards, the reader is reminded that the U.S. system of transport and inter-state commerce regulation is far more complex than in Canada. (See, for instance, the reports of the Interstate Commerce Commission (Washington)).

While both of these have been occurring, the consequent savings cannot be reflected in rates charged either by elevators (except on a company wide average basis) or by the rail rate. More efficient use of the rail rolling stock and less use of yard and port switching can be achieved through multiple car loadings, weekend or multi-shift loading and unloading of cars, single grain and grade unidirectional shipments of blocks of cars (up to the limit of unit trains), more regular shipping patterns, more nearly optimal train sizes for the way freights to and from country points, and so on. None of these operational efficiencies can be reflected in the current rate structure, either by railways or elevator companies. There are some offsetting costs, particularly increased trucking costs associated with elevator and rail line consolidation, and increased capital requirements for rail rolling stock etc. as volumes increase. But it seems likely that overall net savings can be made, (or alternatively greater volumes shipped with current capacity) if these efficiencies were exploited. Evidence for this is contained in the Booz-Allen report. Independent estimates have been made of the possible savings in total GHTS costs from consolidation of rail lines and elevators which take account of the trucking cost changes, by the author and by the Canadian Transport Commission¹.

Although these studies are based on obsolete data (1973/4 and 1974/5 respectively) they show that savings of between 9 per cent and 12 per cent were then possible if the GHTS system were consolidated to the basic network of rail lines² (saving between \$30 and \$50m per year).

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1. D.R. Harvey, "Analysis of the Grain Handling and Transportation System in Western Canada" Agriculture Canada working papers (2) (1977); and Internal C.T.C. working papers on the PHAER (producer haul and elevator receipts) model. See also F.L. Martin et al.
 2. The 'basic network' referred to here is that network of lines guaranteed until 2000AD prior to the Hall Commission enquiry. It thus excludes those lines which have since been added to this basic network by Hall and by the PRAC. The chairman of the PRAC, Dr. Anderson, has said that, with these additions to the basic network, "Canada retains the high cost transportation sector for the grain trade for at least another 25 years" (Canada Grains Council 1978).

b) Monopolistic Influences and Externalities

Abandonment of branch lines, consolidation of elevators and rate making freedom to the railways and handling companies raise the possibilities (within a less than perfectly competitive world) of the exploitation of monopoly power and of oligopolistic inefficiencies. While a reduction in the number of elevators would raise throughput to capacity ratios and hence lower elevator costs per tonne, it would also result in fewer delivery alternatives for producers and the possibility of elevator companies either retaining cost savings (of little importance when the major companies are farmer co-operatives) or reducing levels of service because of the lack of local competition.

The possibility of super-normal profits resulting from local monopolies may well give rise to the classic monopolistic or imperfect competition results¹: competition for market share ultimately reducing economic (excess) profits as throughput is lost to competitors, resulting in excess capacity and thus average cost levels in excess of least cost levels. Arguably this has occurred in the past and is one of the reasons for the over extension of both the rail branch line system and the associated elevator network².

The major condition for these results is that barriers to entry into the industry should be low. Escalation of the capital costs of new elevator construction compared with the low capital burden associated with existing facilities has tended to raise these barriers

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1. As first analysed by E.H. Chamberlin: Theory of Monopolistic Competition (Harvard U.P. Cambridge, Mass. 1963) See also any standard economics textbook, e.g. Wonnacott and Wonnacott, Economics. McGraw Hill, 1979, p.493-494.
 2. An important contribution to rail line over extension (evident ex post) was the level of support and encouragement given to the rail companies by the federal government in the early days (see Hall, Vol. 1).

and reduce the possibilities of new excess capacity¹. However, the abandonment of whole branch lines means that elevator company market shares are substantially altered and the resulting competition to retain and improve shares could cost the producer dearly.

The Canadian Grain Commission both regulates elevator handling rates and licences elevators. It thus has the ability to offset these tendencies, though it has not, to date, used the licencing authority to dissuade over-expansion of elevator capacity.

The railways, given absolute freedom in rate setting and no counterveiling power, would have the greatest opportunity to increase revenues and decrease costs through a severe concentration of delivery points on main lines. Perhaps the Grains Group scenario of 20 inland terminals² would be the most efficient and remunerative from the railway point of view. Such a concentration, however, would substantially increase truck costs and associated road costs and would be unlikely to be in the interests of minimum total GHTS costs (see Martin et al). Railway freedom, however, would allow non-cost related rate discrimination to significantly encourage centralization and would also allow exploitation of monopoly power against producers interests, (and, through production and farm income effects, against the regional economies interests).

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1. Recent examples, however, include the construction of high throughput elevators at Rosetown, Saskatchewan and at Moose Jaw, Saskatchewan and of an inland terminal (with significant public assistance through DREE) at Weyburn. At all of these points, and within their catchment areas, there is already substantial spare, albeit old, capacity in the elevator system. There is no guarantee that competing companies will allow even old elevators to fall into disuse to enable the new facilities to take full advantage of their throughput potential and thus of their cost advantages.
 2. Grains Group. Grain Transportation Studies 1970/71. Ottawa.

V.4 Capital Investment Issues

Projections of Canadian exportable surpluses of grain (Table V.4 above and Section II.4) strongly suggest a substantial growth over the next five years. The capacity of the GHTS to move this increased volume is, however, suspect, to say the least. Recent experience suggests that, under current arrangements and practices, the upper limit of this capacity is of the order of 22m tonnes per year, i.e. some 8m tonnes short of likely requirements¹. Although improvements in the utilization of the system can and will improve the effective throughput capacity of the GHTS, it is generally accepted that substantial capital investment will be necessary. Table V.5, taken from the Booz-Allen report, shows the major investments that are likely to be required.

TABLE V.5 - Potential Major Capital Investments
1979/80 - 1985/86 (million \$)

	Low Estimate	High Estimate
Grain Cars (in addition to cars already on order)	400	572
Locomotives	106	171
Prince Rupert Terminal Elevator	100	100
Branch Line Rehabilitation ¹	700	700
Railway Main Line Capacity ²	-	408
Total	1,306	1,951

SOURCE : Booz-Allen Report, p. XI-3

- NOTES :
1. Some of this has already been spent (see pages 46, 47 above)
 2. Not all of this is attributable to grain traffic.

1. See, for example, CWB annual report 1977/78, pages 14 and 22 where it is made clear that, in spite of record exports of 21.7 m tonnes, a further 6m tonnes of exports had to be deferred or delayed because of limitations in the handling and transportation system.

Although these figures seem staggeringly large, the potential exists for a reasonable return to be made on this level of investment, at least in aggregate. If it is supposed that without this investment some 5m tonnes of exports per year will be 'lost', then at an average of \$625m per year¹. The value added in producing this additional grain (estimated from WGS data at about \$56 per tonne) would be \$280m per year. In this light, then, the levels of capital investment do not seem so enormous.

The current environment, particularly for the railways, is not likely to attract this level of investment from private sources. In commenting of the results of the rail costing exercise, Snavelly (1978) says they "go a long way toward explaining why the railways have not invested in equipment for the transportation of grain and why they have deferred substantial maintenance and virtually all capital expenditures on grain dependent lines", (p.80-81). The Booz-Allen report notes that "the railways have indicated that they will make no significant investments to support grain movements including locomotive purchases to handle added grain traffic in the absence of compensatory rates", (p.X1-3). The implication is that, failing adequate compensation to the railways, this capital will have to be provided either by the producers themselves, through the CWB (who have already ordered 2,000 hopper cars for delivery in 1979/80 at an approximate cost of \$8.5m)², or by the Federal Government. Alternatively, grain exports will continue to be frustrated by the lack of effective rail capacity. It should also be noted that the Snavelly estimates of rail costs refer to the cost of running the current system

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1. It seems possible that bumper harvests combined with a deterioration of the GHTS capacity if no further investment is made may limit exports in some years by as much as 10m tonnes. Gross revenue lost for those years would then be \$1250m per year. The value added loss would be \$690m/year, assuming that export limit is immediately translated into a reduction in production.
 2. In fact, however, this decision by the Board was challenged in the courts as being outside the CWB's legal powers, see CWB annual report 1977/78. However, the Board has been able to go ahead, and more cars (at least 3,000) have recently been ordered by the Federal and Saskatchewan Governments (CWB Annual Report 1978/9 p.33)

in an ongoing state and not to the cost of running a substantially renovated and expanded system. Thus, to compensate the railways according to Snaveley's estimates will not, of itself, generate the capital improvement and expansion necessary to cope with larger volumes of grain.

It should be clear that, from a real final product or real income point of view, rather than from a grain income point of view, the real question under these circumstances would be concerned with the foregone exports of raw grain versus the increased output of livestock and livestock products which would occur as a two price system for grains developed¹. The \$625 is not related to this question and one could envisage a situation developing which, from the point of view of efficient resource allocation, over-emphasised rather than under-emphasised grain based animal agriculture in Western Canada. While this 'default' scenario may well in the end minimize the costs associated with the Crow rates, it would not be either a particularly beneficial outcome for grain producers or a rational and efficient outcome for the Western Canadian agricultural economy.

Much of the needed capital investment has so far been undertaken by the Federal government (and thus the taxpayer)². Should this

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1. Frustrated export movements, indeed frustration of any rail movement off the prairies, would result in growing farm stock levels and the depression of local grain prices as these stocks are disposed of locally. The local prairie price would fall relative to export prices, encouraging livestock use of the surplus grain, as happened for different reasons during the late 1960s.
 2. The exceptions are the Prince Rupert terminal (which relies on some government support) and the CWB's recent purchase of 2,000 hopper cars on the producers behalf.
The heavy involvement of the government in remedial and rehabilitation capital expenditure, particularly on the rail system, has apparently been justified by the failure of public policy (the Crow rate) in the past to provide adequate remuneration to the railways. Other important influences have been the increasingly constraining effect that the system is having on grain exports and, one cannot help feeling, the political palliative effect in the absence of any clear decision on the future of the Crow rate. In addition, in the case of previous hopper car purchases, the effect of the purchases on manufacturers (in central and eastern Canada) undoubtedly provided a significant part of the justification for the expenditures.

trend continue, however, the government of Canada will quickly become the major shareholder in the Prairie grain rail system. The taxpayers are entitled to ask what they are getting in return and whether this expenditure is an appropriate and efficient use of government funds.

Again, the data available for this evaluation are somewhat limited and the task is a complex one. There are, however, reasons to question the efficiency of some of the expenditure. As far as the railways are concerned, it would not be surprising if they adopted the view that, at least in the short term, the likelihood of obtaining full remuneration for the grain service has not been very great. The alternative is, therefore, to persuade the government to take over some of their costs and improve the capital structure of the rail system. Whether deliberately or not, the railways have had some success in this direction, particularly with hopper cars and with branch line rehabilitation. Within this scenario of both a large element of political justification for the expenditures and the fact that neither party (recipient or donor) is overly concerned with the economic efficiency of the investments, it would be surprising if the results were entirely economically efficient.

i) Grain hopper cars

The traditional grain car fleet of older box cars has been declining as the general rail car fleet becomes more specialised and as the grain fleet itself becomes older and nearer to eventual collapse. Hopper cars will certainly be needed eventually, and their cost is rising so it makes a certain amount of sense to purchase them sooner rather than later, especially if their existence in the grain car fleet can ease the transportation bottleneck.

However, the capital cost of hopper cars is much higher than box cars. The turn-round time for hopper cars would need to be at least half that of box cars before they become economically efficient competitors with box cars¹.

1. Assuming similar operating costs for both box and hopper cars, for lack of more detailed information.

Since there is little or no incentive within the rest of the handling system to improve turn-round times or to utilize cars efficiently, there is little chance of such a difference in turn-rounds materialising¹. Under these circumstances, the railways would not invest in hopper cars until and unless they ran out of useable box cars. At least until recently, there have been a large number of box cars available, and there are still a significant number on the railways books.

Furthermore, from the railways point of view, the gift of the hopper cars allows them to retire box cars earlier than otherwise (thus avoiding the associated capital costs) or divert them to other more remunerative traffic, including leasing them in the U.S.. Thus the early infusion of hopper cars into the system may not either be economically efficient or improve the transportation bottleneck on Canadian grain movement.

ii) Branch line rehabilitation and upgrading

Appendix 1 to this section details some estimates made by the author on the basis of the Snaveley Commission data (1974) of the savings in operating and maintenance costs associated with various levels of rehabilitation and compares these with estimates of the capital cost of rehabilitation².

Although the figures are seriously out of date, the principles involved are sound and the results do raise questions about the economic efficiency of upgrading all but the most heavily used parts of the system³. From the railways point of view, though, any saving

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1. In 1974, box car turn-round times were in fact lower than the hopper cars. The railways bear the capital costs of box cars but not hopper cars. (Snaveley, 1976)
 2. The estimates are now rather obsolete (it has not been possible to update them for this study) and are based on rather cavalier treatment of the available data.
 3. The figures suggest that it only makes economic sense to upgrade the top two density categories, which are probably already of a fairly high standard.

in operating costs, however small, is a net saving because of the grant of capital. As a corollary, maintenance of minimum operating standards seems to be the most economically efficient option in many cases¹.

The evidence that rehabilitation of the Prairie rail network is not economically efficient is far from conclusive. It seems to be generally accepted that the money is both necessary and well used (see e.g. Booz-Allen). However, both the economic environment within which the rehabilitation program is being carried out and some preliminary estimates made of savings versus capital costs suggest that there is a real possibility of inefficient use of the capital grants.

1. The Snavely cost estimates include some provision for maintaining track at this level (or at least at actual 1974 operating standards).

V.5 A Possible Future Direction

The major problems raised in this section are :

a) the fact that the Crow rate and associated lack of revenues to the railways is: limiting the enthusiasm and effectiveness of the GHTS and thus limiting grain exports; is causing significantly inefficient resource allocation within Western Canada; and implies a large and growing taxpayer subsidy to grain producers;

b) the fact that a change from the current policy will have to take account of the economic losses suffered by grain producers (if they are to bear responsibility for the rail costs) and will have to recognise that some regulation, or countervailing power, will be needed to offset the potential railway monopoly position, and may also be needed to regulate local elevator monopolies or the elevator configuration;

c) the fact that the strict regulation of rates embodied in the Crow and in regulation of elevator tariffs does not allow the price mechanism to reflect the relative efficiencies of various parts of the system and thus does not provide any incentive to use even the current limited capacity of the system efficiently¹;

d) the fact that neither of the parties currently involved in the capital investment in the rail system (the railways and the federal government) have any strong incentive to ensure that the large capital expenditures necessary to revitalise the system are being spent efficiently.

These problems may be dealt with under the headings of Compensation (both for the railways and producers) and Regulation (including the possible pricing mechanism).

1. This is especially important when competition for available transport capacity with other users is included. Other users currently offer the railways greater revenue opportunities, so competition will be intense and effective capacity for grain seriously limited (see Anderson).

i) Compensation

There are clear economic net benefits associated with the producer paying the railways for the service provided and thus having more scope for influencing the level of service and using it efficiently, and being appropriately compensated for the economic losses that will be suffered as a result of this change. The compensation package needs to be as administratively simple as possible, and as free from ongoing political interference and controversy as possible, but it should also recognise that the actual amount of compensation necessary or desirable is not uniquely determinable but is essentially a matter for negotiation. It is also likely that no compensation package exists which is completely 'equitable', just as the current situation or direct subsidization to the railways is inequitable (in their treatment of livestock production, the taxpayers and the western economy).

In looking for an appropriate method of compensation, two facts stand out. Firstly, the compensation should be 'resource-neutral', and the usual economic text-book answer is that a lump sum payment is required. Secondly, the major economic loss suffered from a change in the rates is a wealth (land value) effect. Once land prices have adjusted to the new, variable, rail rate situation, new entrants to the industry will be no better and no worse off than current producers. The obvious method of compensation to meet these requirements is a government bond equivalent to the present value of the (negotiable) future stream of grain income net benefits from a continuation of the current Crow rate. The precise nature of the bond (whether redeemable or a consol, marketable or not, and the rate of interest) and the methods of calculating the value of each individual producer's or land owner's issue are matters of detail for discussion if and when the principle is accepted.

The major features of such a compensation method are as follows :

- a) Compensation is determined at the outset and thus is resource neutral.
- b) Once determined and issued it is administratively simple and immune from further interference.
- c) The bond, if saleable or redeemable, or used to secure loans, can be used as either capital (for diversification of the farming enterprise or as part of a retirement fund, which would not be possible with an annual compensation method) or as compensatory income through clipping coupons. (In either event the interest, whether collected by the producer or not, can be included in grain receipts as far as W.G.S.A. is concerned to avoid double compensation).
- d) The bond would be a separate and distinct species from the normal government issue and there is considerable flexibility in their design and interest bearing characteristics.
- e) There is no reason why the distribution should be constrained in any specific way, e.g. issues of bonds could be limited to an absolute amount per individual if that were felt desirable.
- f) The total government bill is limited (finite) and, while large, can be no larger than a commitment to make good the railway's revenue shortfall indefinitely.

ii) Rate Setting and Regulation¹

The essential problem is one of allowing sufficient freedom to the railways and elevator companies to set different rates for different types of movement, and hence of reflecting the cost savings and efficiencies to the producer, and of allowing sufficient return on capital to warrant new investment as and when economically justified, and yet to control the ability of the companies to exploit an essentially captive (and compensated) traffic. There is a trade off between clear, unambiguous and rigid control (exemplified by the current statutory rate) and a flexible and responsive price mechanism which could influence and encourage both efficient use and optimal investment patterns, but could also be economically abused.

Again, two features of the problem stand out. Firstly the regulatory mechanism must be cost related, to avoid undue exploitation and yet allow for cost recovery and normal profits and, for political reasons if no other, probably need to be statutory.³ Secondly, the CWB in representing the grain producer and as a major user of the system, is in an ideal position to negotiate rates with the railways and handling companies from a system wide perspective². A possible mechanism might, therefore, be as follows.

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1. General freight rate regulation has been the subject of substantial discussion as to its merits and defects with respect to equity, economic and regional development and so forth. While the subject is occasionally raised as a major concern in Western Canada and one which cannot be divorced from the Crow issue, the inclusion of this major area practically guarantees that progress on the grain-rail issues will slow to a halt.
 2. The CWB already negotiates rates with the handling companies under the overall regulation of the Canadian Grain Commission.
 3. Regulatory bounds of some sort are justified by the possible monopoly effects discussed above (p.119).

General statutory bounds would be set on rail revenues from grain traffic related to rail costs, which would be established at regular intervals by a costing enquiry of the form of the Snavely Commission. The bounds could set maximum average revenues per ton mile or in total for grain moved off the Prairies and also some maximum deviations from this average, for instance, by branch line traffic, single car shipments, infrequent shipments, rail car demurrage. The bounds could allow for inflation between cost enquiries, to allow the rail companies to exploit, within certain limits, any cost savings. These savings would then be shared with producers at the time of the next enquiry¹.

Within these bounds, negotiation of actual rates would be left up to the railways and the users (the CWB and the trade). An arbitration authority could be established (under the C.T.C. for instance) to mediate if necessary in these negotiations. This would provide considerable scope for the C.W.B. to negotiate volume discounts, service contracts with bonuses and penalties and so forth. Other avenues include:

- i) the possibility of negotiating a two part tariff, an initial lump sum payment (licence fee for the private trade) which would cover these costs essentially invariant with changes in volumes moved, and a per unit tariff reflecting costs which vary with changes in volumes (i.e. different from the Snavely definition of variable costs which were those costs which depended on the existence of grain traffic rather than changes in the volume of that traffic);

1. Similar cost related bounds could be established for elevation tariffs, through the Canadian Grain Commission.

- ii) the direct investment in rail plant and equipment by the CWB, as has already been done with the 2,000 hopper car purchase; to meet peak-load problems and provide surge capacity;
- iii) the possibility of negotiating 'equalised inter-annual billing' to equalise grain rail costs with low and high grain sales revenue years;
- iv) the possibilities for the CWB to exercise considerable discretion about the equity of treatment of individual producers, in establishing main line branch line differentials, long haul/short haul relative rates and so on. Alternatively, such discretion could be passed on to the Wheat Pools and grain co-ops thus allowing producers to 'vote with their feet' as to the extent of cross subsidisation they wish to see.

VI SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

VI.1 Introduction

This report is critical of many practices in the grains industry. That is its job, to critically examine government intervention and regulation in the grains industry. However, to place these criticisms in context, several points should be emphasised.

Firstly, given the institutional and practical constraints within which the industry operates, the performance is generally good, not to say remarkable. Production of 34 m. tonnes, marketing 22 m. tonnes and exporting 18m. tonnes of grains and oilseeds per year is no mean achievement¹. Canada has established and, thus far, maintained a justifiable reputation in world grain markets.

Secondly, criticism of performance has not been intended as criticism of people or institutions, but rather of the constraints within which they operate and the practices which are currently employed. Many of these constraints and practices were developed in circumstances that were very different from those existing today. Practices well suited to the establishment and initial growth of the grains industry and its marketing facilities and institutions in the Canadian North west, or well suited to the maintenance of that industry in a period of sluggish world demand and burgeoning grain stocks, are not necessarily suited to conditions of, it seems, increasingly volatile world demand, rapid price movements and emphasis on throughput. It has been the purpose of this report to examine current suitability and related performance rather than explore the history. Further, to anticipate the conclusions, examination and criticism of these constraints and practices is not, typically, part of the job of any of

1. 1973-4 to 1977-8 averages, six major grains.

the major parties in the industry. Their job is to make the existing system work and criticism of the framework is ordinarily not conducive to that end¹.

Thirdly, while the principles of objective evaluation of performance are straightforward, the actual analysis is confounded by lack of resources and data. The results are inferred rather than implied, are subject to important caveats and, no doubt, subject to wide interpretation and argument.

Fourthly, the world works in practice and not in principle. The results of this analysis, however, are largely confined to conclusions in principle. The outstanding questions (aside from disputes and debate about the conclusions themselves) are whether these principles can be made operative. There are no clear answers here. The search requires a conviction by all parties that the future development and growth of the industry is important, is likely to require and force change, and deserves constructive ideas and methods to avoid undue adjustment problems, rather than rear-guard actions which, consciously or unconsciously, seek to avoid or prevent change.

Finally, it should be noted that attention has been restricted in this report to the activities of the CWB and to the major instruments of regulation and intervention in the grain handling and transportation system. It has also been restricted to western Canada. Thus the report does not attempt a full catalogue of all of the regulation and intervention mechanisms in the Canadian grains industry but rather concentrates on those which are, qualitatively and quantitatively, most important.

1. To the extent that it occurs, it generally creates conflicts and tensions which, this author is sufficiently naive to think, are usually counterproductive in the ordinary everyday workings of the industry.

VI.2 Summary

An attempt is made to summarize the results of this report in Table VI.1. The table shows the nature of the transfers of money, control and responsibility relative to a system typically involving greater use of the price mechanism and greater financial and decision making responsibility by grain producers and users of the grain handling and transportation system (GHTS). In so doing, the vested interests in maintaining the status quo can be isolated from those with a vested interest in change (implicitly, change towards a de-regulated option). The cost and benefit columns attempt to include distributional and dynamical aspects of the change and are not confined to comparative static economic concepts of resource allocation costs and benefits. As a result, there is no attempt made to isolate net benefits. These must remain a matter of judgement and, ultimately, democratic decision, and are not amenable to 'objective' economic analysis.

i) The Canadian Wheat Board

The instruments of regulation associated with the CWB are divided into four categories: the Central Selling Agency role (p.60-63); marketing strategy (p.64-80); marketing tactics(p.81-87); and equity/distributional objectives (including the quota and price pooling)(p.88-93 and p.97-102). Although somewhat artificial, this categorisation does allow separation of the major functions of the Board. As can be seen, the regulation generally involves a transfer of control and responsibility from the private grain trade to the CWB (and thus to grain producers). It does not involve any transfers from the Federal government (taxpayers). Associated with this transfer is a de-emphasis of the price and profit mechanism in favour of quantitative controls of delivery patterns and grain forwarding through the grain handling and transportation system.

Specifically, there are considerable potential advantages to be derived from a central selling agency for the Canadian export grains (briefly listed in the table). These advantages may be offset by a tendency towards conservatism, excessive bureaucracy and lack of initiative within the agency. However, in the case of the CWB, recent decisions such as the purchase of grain hopper cars and investment incentives for west coast elevator construction do not suggest that the CWB is excessively conservative. Under marketing strategy, export performance is generally explained by factors beyond the Board's control¹. However, the final result (prices achieved at the farm gate) does not compare favourably with those achieved immediately south of the border, especially when the potential benefit of the Crow subsidy (see below) is included. Apart from a slight question about the performance of the CWB in negotiating and timing of sales², the major contributors to this disappointing result would seem to be the constraints on flexibility of selling strategy imposed by the GHTS and by the tactical grain forwarding mechanisms used by the CWB.

The CWB's marketing tactics are characterised by quantitative controls and penalties, and by some inflexibility introduced through the satisfaction of equity and distributional objectives. This leads to

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1. Transport and handling constraints, Canadian production and exportable surplus supplies, characteristics of world grain market with the U.S. as a dominant supplier, U.S. grain support policies, and lack of flexibility in the timing of sales are all likely to provide significant constraints on the Board's export strategy.
 2. This question arises because of two observations. First, there is no profit incentive at work within the Board to encourage high sales performance, and an associated lack of professional sales negotiations. Second, there is apparently no evaluation mechanism within the Board to monitor past sales performance and no direct responsibility to answer to the producer shareholders for this performance. Neither the annual reports nor the meetings of the CWB Advisory Committee offer any effective evaluation of pricing and average receipts performance.

a lack of incentive and encouragement to use the GHTS efficiently (documented most recently by the Booz-Allen report); problems for the interface with the off-board, open, market for feed grains and consequent problems in managing the level and scheduling of deliveries to the Board; and to penalties which tend to further restrict the use of the GHTS by the private handling companies, rather than reimbursing the CWB and producers for extra costs and potential missed sales opportunities. The potential gains in control over grain forwarding, offered by quantitative control rather than price incentives, do not appear to have materialised in the recent past. At a time when the throughput capacity of the GHTS is limited and when the timing and level of export sales and deliveries is vital to marketing performance, the inefficient use of a scarce resource is likely to be very costly. Neither should it be imagined that the capacity constraint in the GHTS will become any less tight in the future. Spare capacity is expensive and the demands of competing and profitable users will grow rather than diminish, so that this constraint is always likely to be limiting.

As far as the equity/distribution objectives are concerned, the most outstanding point of the table is that the transfers involved are essentially between different groups of producers¹. Furthermore, and not evident from the table, the delivery quota is a necessary consequence of price pooling, which eliminates any price incentives to schedule deliveries to the GHTS, although there are other reasons for the existence of the quota system. Not only do these two mechanisms contribute to the lack of flexibility in marketing tactics,

1. There are two government programs associated with price pooling and the quota (the initial price guarantee and the Prairie Grain Advance Payments program) which introduce a taxpayer interest. Neither of these are absolutely essential parts of the CWB objectives and the money transfer from taxpayers is not large (\$5m per year or so).

and thus to poor price performance¹, but also there is good reason to suppose that the quota system is both distorting production decisions in Western Canada, and effectively restricting production below its potential. Since Canadian export market share is constrained by the relative growth of grain production and exportable surplus in Canada, this restriction of production is a potentially significant factor in the somewhat disappointing export share.

Given the current capacity of the GHTS, it is unfair to suggest that the linked quota/pooling mechanisms are solely or even, now, primarily responsible for the somewhat unsatisfactory export performance of the Canadian grain industry. But it is questionable whether the compulsory nature of these mechanisms is strictly necessary to achieve the benefits.

A legally enforceable contractual pool, with a given volume of producers deliveries committed to the pool would, in principle, be a viable and competitive alternative to a variable price regime and would offer broadly similar benefits to participants as the current compulsory system². Freed from the necessity of pooling receipts, the CWB would then be in a position to make more use of forward contracts³, use storage premia and delivery incentives and so forth to encourage the appropriate timing of deliveries. The consideration that would need to be given to farmers delivery alternatives, storage and carrying costs etc. would be a useful discipline on Board marketing tactics. Combined with greater use of the price mechanism in rationing the scarce GHTS facilities and services between competing

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1. In fact, the delivery quota system has now become extremely complex, consisting of initial, terminating, and regionally and grain/grade specific quotas in an attempt to gain greater control and flexibility over farm delivery patterns. Arguably this has the result that original equity objectives are compromised to some extent.
 2. Such voluntary but contractual pools could be operated either by the Board, or perhaps with less risk of conflict, by the producer co-ops. The major question would be whether there would be enough takers.
 3. The CWB already uses these for utility wheats.

grain uses, the CWB could gain significantly in flexibility of marketing decisions and extract monetary recompense on behalf of producers for inefficient use of the system. Some certainty of delivery control might be lost, but the evidence does not suggest that this is particularly certain or predictable under the current quantitative controls.

ii) The Grain Handling and Transportation System (GHTS)

Regulation and intervention measures are categorised as: the Crow rate (p.105-112); capital expenditure provisions (p.120-125); and regulation of elevators and of the rail line configuration (p.116-119).

The Crow, or Statutory, rail rates are not sufficient to cover rail costs (Snively, (1976) and (1978)) and thus incorporate an element of implicit subsidization as well as rigid control over rail rate setting¹. The effect of the subsidy is to increase the farm gate price for export grain, encourage the export of unprocessed grain and discourage livestock production in Western Canada. The net result is a substantial and growing subsidy to grain producers from taxpayers and railways and a loss of real output from western agriculture and agribusiness². The current status, with the railways absorbing the major part of the cost in foregone maintenance and lack of replacement investment, is curtailing the capacity of the rail system and implies greater financial commitment, both current and capital, to the system from the government. At the same time, the implicit subsidy is obviously benefiting grain producers and, to a large extent, has been capitalised into grain land values.

While some regulation of rail rates on grain can be justified in view of the monopoly position of the railways and the captivity of grain traffic, the rigid control achieved through the statutory rate

1. These rates are fixed, at essentially 1897 levels, for grain and grain products except oilseed products, moving from each country location in the prairies to export position.

2. See Harvey (1980) as well as Section V of this report.

prevents system costs and efficiencies being reflected in the rate structure. As a result there is a lack of incentive to exploit potential cost savings and improvements in the throughput capacity of the GHTS, and a lack of any financial penalty on inefficient use of the scarce resource. This rigidity is repeated in the current control over elevator tariffs exercised by the Canadian Grain Commission¹.

The growing need for capital rehabilitation and replacement within the GHTS, principally in the rail system, and the lack of profitability associated with grain traffic, have obliged the government to provide capital grants to the railways (and for some elevator construction)². However, a significant element of political justification for capital grants on the part of the government and a lack of interest in the global efficiency of the investment (i.e. with reference to the GHTS as a whole) on the part of the recipients (railways) means that there are grounds to question the economic utility of some of this capital expenditure. Although it is widely regarded as necessary, even essential, (see e.g. the Booz-Allen report) there is some evidence, albeit out of date, of the inefficiency of some of this investment.

The configuration of rail branch lines (and, thus, of elevators) has been comprehensively examined recently by the Hall Commission and its successor, the Prairie Rail Action Committee. This issue is effectively settled and there is little point in reviving it now, except that the development of the elevator configuration on the fixed basic network of rail lines is not determined. Competition for market share between elevator companies can result in over-capacity

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1. The Commission sets maximum tariffs, based on costs. Elevator companies can and do set tariffs below these maxima, but are notable to differentiate tariffs between facilities and locations within the company. Thus actual cost savings specific to installations cannot be reflected in tariffs charged or by premiums and discounts.
 2. Capital investment funds have also been provided directly by the CWB, on behalf of the producer, for the purchase of grain hopper cars and the expansion of grain terminal capacity on the west coast. More recently, the Provincial governments have also been involved in grain car purchases (see CWB Annual Report 1978/9, p.33 and 41).

and consequently high costs, although this is limited by the current high cost of capital investment in elevator facilities and low profits (in part because of existing excess capacity in the country). The Canadian Grain Commission licences elevators and thus could exert a considerable influence on the configuration. It has not done this, nor plans to and the cost and difficulties associated with optimal planning of the system in a continually changing environment may well outweigh the theoretical benefits.

While, again, there is scope for an increased use of the price mechanism within the GHTS, there is also a justification for regulation of, or at least counterveiling power against, potential monopolistic externalities. There is also a need to consider the appropriate level and method of distribution of both burdens and benefits of the existing Crow subsidy. To deal with the latter first, it is suggested that this subsidy (the level of which is largely a matter for negotiation) should be paid direct to grain producers. It should be paid in a resource-neutral way, thus allowing the real output effects to materialise, and should be paid so as to compensate producers (grain land owners) for the economic losses they would incur as a result of elimination of the subsidy¹.

As far as rate (and elevator tariff) regulation is concerned, some statutory bounds on rail rates are politically and, arguably, economically justified. However, the grain producers, through the CWB can exert considerable counterveiling power against railways and elevator companies. It is suggested that this, reinforced by an arbitration mechanism, could allow very much more substantial rate and tariff differentiation in the light of cost savings and potential efficiencies than currently exists².

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1. The method suggested is a lump sum payment, financed by a bond issue. This makes the compensation resource-neutral, finite (although large), immune from political interference, administratively straightforward (incurring a once and for all administrative cost) and provides significant flexibility in both design of the bond (interest structure, marketability etc.) and the use to which the compensation is put (to finance adjustment, provide annual compensation, or a lump sum capital loss compensation).
 2. The CWB already negotiates company-wide tariffs with elevator companies, and with shipping companies on the Great Lakes, St. Lawrence Seaway.

iii) The Western Grain Stabilization Act, 1976
(WGSA) (p.94-97)

The ability of the CWB to influence the stability of prices, and, a fortiori of grain revenues, on an inter-year basis is strictly limited and the onus has effectively been removed by the introduction of the WGSA. This program involves taxpayer support (\$50m per year) and thus warrants some examination. The major benefit likely to stem from the plan (which has not been in operation long enough for a comprehensive evaluation) seems likely to come from reduced variation in grain related business and expenditure in the western economy. The plan has been designed in such a way that resource allocation decisions within grain production and agriculture generally are minimally distorted.

TABLE VI.1 SUMMARY OF TRANSFERS, COSTS AND BENEFITS OF MAJOR REGULATION AND INTERVENTION - CANADIAN GRAINS

REGULATION/ INTERVENTION	TRANSFERS	FROM	TO	COST	BENEFIT
C.W.B.: a) Central Selling Agency	marketing opportunities and margins	graintrade, private company shareholders	grain producers (through the CWB)	Potential disadvantages: absence of profit motive, tendency towards bureaucratic agency and lack of innovation/ sales drive.	Potential exploitation of C.S.A. advantages stemming from: - production and transport characteristics; - world grain market characteristics; - control over export flows; - international negotiating power
b) Marketing Strategy	"	"	" (through the CWB)	- disappointing price performance, farm grain receipts 15% below those in N. U.S. - concentration on hard, food, wheats and lack of response to growing feed grain markets - limited by production patterns.	larger, more regular volumes, given supply characteristics, than private trade through concentration on Canadian exportable surplus
c) Marketing Tactics	grain forwarding control and incentive	private trade and open market	C.W.B. and producers of Board grains	- lack of price mechanism, lack of incentive/flexibility to use GHTS efficiently and thus loss of export capacity and higher costs. - conflict between Board and off/on Board markets. - contributes to disappointing price performance.	- potentially more control over deliveries and grain forwarding. (Not apparent in practice) - reduces marketing expertise required of producers - allows price pooling and 'equity' objectives to be met.

TABLE VI.1 cont.

REGULATION/ INTERVENTION	TRANSFERS	FROM	TO	COST	BENEFIT
d) Equity/distribution: i) Price pooling	\$	producers with relative risk preference and marketing expertise	risk averse producers without marketing expertise	<ul style="list-style-type: none"> - compulsory nature of pooling reduces freedom of choice - lack of price incentive for delivery scheduling - encouragement of commercial rather than (cheaper) farm storage. - hence need for quotas. 	<ul style="list-style-type: none"> - avoids producer responsibility for intra-year marketing decisions.
ii) quota	\$	intensive producers on high quality land	extensive producers on low quality land	<ul style="list-style-type: none"> - reduced production and exports (5-20m tons/year) - resource misallocation, more extensive production of Board grains, encouragement of non Board grains, land market distortions 	<ul style="list-style-type: none"> - control over export volumes - control over distribution of delivery opportunities among producers.
G.H.T.S. a) Crow Rates - subsidy	i) \$220m./year, growing ii) \$100m./year, growing	taxpayers: \$60-70m railways: \$150-160m. livestock production, western Canada.	grain producers. (land prices increased by perhaps \$30/acre grain production, Western Canada.	<ul style="list-style-type: none"> - \$65 to \$170m./year in foregone real final product (agriculture and agribusiness) - lack of investment and enthusiasm for grain export movement, leads to need for further remedial intervention (capital requirements \$120m./year). - lack of price incentives for efficient use of system 	<ul style="list-style-type: none"> - "cast iron" rail rate control - subsidy to grain producers (\$220m/year)
- regulation of rail rates	iii) establishment of rate structure	Railways and users (the CWB)	Government (fixed by Statute)		

TABLE VI.1 cont.

REGULATION/ INTERVENTION	TRANSFERS		TO	COST	BENEFIT
	FROM	TO			
b) Capital expenditure on rehabilitation and upgrading	i) Approx. \$120m/year	taxpayers	railways and grain exports	- lack of effective interest in efficiency of investment	- expansion of grain export capacity (but not necessarily utilization) of GHTS by 5-10 m. tonnes (\$625-\$1250m/year gross revenues).
c) Regulation of GHTS - elevators:	i) some control over tariff setting: ii) potential control over elevator system configuration.	handling companies "	government "	- lack of effective price differentials between facilities. - cost and difficulties of formulating minimum cost elevator configuration on an ongoing (dynamic) basis - potential to reduce local competition, and associated cost of regulating monopoly profits and lack of service.	- regulation of local monopolistic profit. - potential to achieve more efficient system
branch line abandonment:	i) control over abandonment ii) cost responsibility for branchline fixed costs (\$50-60m/year)	railways "	government "	i) administrative and enquiry costs ii) subsidization of uneconomic branch lines	- regulation of railways potential ability to dictate configuration of GHTS - control over effects on local and rural economy and infrastructure.
W.G.S.A.	i) \$50m/year. ii) \$	taxpayer grain receipts in years of relatively high receipts	grain producers grain receipts in years of relatively poor receipts	- opportunity cost of taxpayers money. - interest charges on inter-year producer transfers	- increased grain production and exports? - reduction in risk of very poor income years - increased stability of agribusiness, rural and regional economies.

VI.3 Conclusions

i) There is scope for improving the efficiency and performance (particularly the export performance) of the grain production and marketing industry. Exploitation of this potential, however, requires that the price mechanism be used to a much greater extent than it is at present, and thus that the regulatory mechanisms be significantly altered. Ways in which this might be done have been suggested, which seek to minimise the adjustment costs and retain the advantages of the present system.

ii) There are strong interrelationships between the various intervention/regulation mechanisms which are clearly shown in Table VI.1. The major links are the interdependence of the marketing strategy and marketing tactics of the CWB with the satisfaction of equity and distribution objectives, and the further link between the regulation of rail (and elevator) rates both with the marketing tactics and flexibility of the Board and with the provision of capital to the GHTS. This suggests that the potential gains to be made from a strategic change in the whole direction of public or quasi-public intervention are significantly greater than the sum of partial or piecemeal changes.

iii) There are strong pressures within the system for change, particularly with respect to the capacity of the GHTS, and changes are being made (e.g. branch line abandonment, capital rehabilitation and upgrading, CWB investments and so forth). However, the full implications of: a) a growing and as yet unfulfilled taxpayer commitment to the system; and of b) the change from a storage and restricted production environment of the 1960s to a high throughput, flexible and expanding potential export environment of the 1970s and 80s; mean that the pressure for change is likely to grow rather than diminish. The Crow rate is the fulcrum about which these pressures are likely to

revolve themselves, but the implications extend far beyond the immediate consequences of the Crow rate¹. There is an immediate and obvious opportunity, indeed a need, for strategic policy decisions rather than the more typical partial, ad hoc and tactical policy changes.

iv) Political Considerations: Development of such a strategic policy without the active participation of all interested parties would almost certainly lead to considerable opposition and hostility within the industry. Such hostility is practically guaranteed to prevent full exploitation of the potential benefits of the policy change (whatever direction that change may take).

The active involvement of interested parties in the development policy frameworks is not uncommon. Considerable effort was made in this respect in the development of the feed grains policy and is currently underway in the definition of a 'food strategy' and an 'agricultural development strategy'². However, the success of such efforts is likely to depend very much on a) the existence of a central co-ordinating or secretariat body, while b) the eventual adoption and promulgation of the agreed strategy and its development into a set of consistent practical policies and instruments requires strong ministerial leadership and support. Failure on either of those counts will jeopardise the effort.

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1. This is true even within the grain and animal agriculture and marketing complex of western Canada. There are some who argue that the issues extend further, to transport policy generally, and even to regional income and the equity of Confederation. Such a broad coverage runs the risk (or possible benefit) of effectively preventing decision and change.
 2. In this context it should be noted that an agricultural development strategy without a comprehensive grains element is an empty box in western Canada, and arguably in Canada as a whole. Yet the lead role in developing this strategy is taken by Agriculture Canada, and reconciliation with any grains policy, currently developed through Grains Group, presents some problems.

The central position of the Grains Group in the policy mechanism, reporting directly to a specific ministerial portfolio, would seem at first sight to be admirably suited to this task. However, the different interests of Agriculture (concerned with agricultural development, diversification and so forth), Transport (concerned with the profitability of the railways, rate regulation and transport policy precedents), and to a lesser extent perhaps, I.T. and C (concerned with export performance and trade policy) do not always pull in the same direction. When the vested interests of the several quasi autonomous public corporations and agencies and the variety of pressure groups are added to the mix, the job becomes complex indeed¹. The predominance of western Canadian interests and the conflict between groups within the western agricultural and agribusiness institutions (e.g. grain producers versus livestock producers and 'free enterprise' groups versus 'orderly marketing' supporters) means that the formation of a strategic policy framework is politically difficult for either major political party.

Thus the politics, including those of the pressure groups² actively involved in the industry, do not seem conducive to the development of an explicit policy strategy for the Canadian grains industry. Yet there exists a wide variety of organisations engaged in active discussion of the issues addressed here, particularly those concerned with the GHTS³. There are, of course, differing opinions and

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1. The recent appointment of the Grain Co-ordinator (see III.4), although a potentially useful short-run response to conflicts in the operation of the GHTS, as recommended by Booz-Allen, also serves to complicate this policy machinery and pressure group system.
 2. Although this discussion continually refers to producer and trade organisations and institutions as pressure groups, it should not be supposed that political pressure is their sole or even their primary function. It is not.
 3. Examples include: the Canada Grains Council, and its Committee on grain handling and transportation (which has produced several reports, e.g. report by the railway compensation sub-committee, Winnipeg, 17.06.77; Key Issues in Transportation, C.G. Council) and which sponsors semi-annual meetings often dealing with related subjects (see Canada Grains Council (1978); and the Palliser Wheat Growers Association, Regina, Saskatchewan which has recently been promoting discussion of these issues, to say nothing of the internal discussion and working papers produced in the Provincial Governments, the Wheat Pools and grain co-operatives, the CWB itself, and the farmer and trade organisations. The Canadian Agricultural Economics Society is organising a workshop session: "Improving the Canadian Grain Handling System" for early August 1980.

interpretations of the current situation, and differences in evaluations of and judgements about the possible policy options. However, the differences which emerge in personal discussion do not seem nearly as severe or irreconcilable as those which characterise the public positions of the organisations and institutions involved. To a naive idealist, it seems that we only have to downplay the 'political element'¹ from the public debate to achieve real progress in the development of an agreed strategy.

There are, broadly speaking, two ways in which these issues might be resolved:

a) The 'de facto' option involves the continuation of debate and discussion as now, with the simultaneous patchwork of partial, stop-gap, policy measures (among which can be included CWB and government hopper car purchases, the grain co-ordinator, the branch line subsidy, and the off-board quotas). The ongoing public debate (and the simple passage of time) might eventually lead to sufficient change in the political conditions to allow a definite and explicit policy strategy to be constructed and implemented within the existing policy machinery. But the more probable outcome would be a continuation of the current situation of piecemeal developments, shoring up the creaking system with patches here and beams there, sometimes favouring one faction, sometimes another. This outcome is viable, in the sense that there is little reason to suppose that ingenuity and craft cannot maintain it more or less indefinitely. It does not, however, seek to resolve underlying conflicts (e.g. between efficient use of the system and adequate protection and equitable treatment of the participants). The continual residue of conflict cannot but hinder the progressive development of the potential of the grain industry.

1. This phrase is intended to convey the idea of the separation of individuals ideas, evaluations and judgements about the current situation and possible policy alternatives from those espoused and defended by the public organisations and institutions.

b) The 'creative' option would involve the attempt to establish a policy strategy in terms of objectives, immutable constraints (which do not necessarily include current organisational or institutional practices), and the resulting set of feasible policy options and instruments. It would then involve evaluation of the option/instrument set with respect to their potential to achieve the objectives, and the further development of compensation /adjustment mechanisms and instruments to minimise the costs associated with changing the regulation and operation of the grains industry.

The difficulty is that, while easy to say, this is very hard to do. It requires considerable and committed effort on the part of all those involved in the grains business. While the commitment could be forced, through for instance a withholding of further public (taxpayer) expenditure until and unless such a strategy is developed by and on behalf of the industry, such an inducement is likely to be counter-productive and, in any event, may not be politically feasible. However, the potential benefits which could be achieved through the creative option are sufficient to warrant the effort, and the recommendations below are an attempt to specify, in broad terms, a way of generating such a development strategy. As such they follow, not from the body of the report, but from consideration of the way in which such a strategy could be formed on the basis of analyses and working papers such as this one.

To conclude, recommendations made here are premised on the following ideas. Firstly, there is a clear distinction between individual views and evaluations of the appropriate strategic policy direction for the grains industry and the positions adopted by institutions and organisations (including government bodies) for legitimate tactical reasons.

Secondly, the scope for achieving consensus on policy strategy among informed individuals is greater than among organised institutions concerned to protect established positions and to maintain and improve ongoing tactical advantages¹; and that this holds as much for debate between government departments as it does in the wider public arena.

Thus, any discussion and development of such a strategy must be clearly and visibly distinguished from the ongoing formation, development and protection of tactical positions. Furthermore, to have any chance of success, it must involve the active participation of those actively involved in and affected by the conduct and performance of the grains industry.

The proposal which follows is for a new forum, clearly and deliberately separated from the existing political and policy making machinery and institutions, with the express purpose of developing such a strategy independently of current tactical considerations².

While these recommendations are for more talk and not, immediately, for action, it should be noted that: actions which are already taking place need not be restrained by this process, though they should be influenced by the emerging strategic framework; the proposal really only organises and formalises discussions and analyses which are already occurring and which seem to be increasing; and, finally, the proposal is premised on the dictum that constructive jaw is far better than destructive war.

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1. This is largely because the public perception of the difference between a strategy (concerned with possible changes to an established institutional and operational framework) and tactics (to do with maximising advantage within an existing and given framework) is blurred, so that institutional agreement to a strategic change is wide open to misinterpretation as the surrender of tactical advantage, with the consequence that open discussion of strategies becomes politically dangerous if not suicidal.
 2. To ensure visible independence, it might be necessary to second members of the new forum (the Grains Industry Conference is the name used here) from existing institutions on a full time or part time basis, and to finance them independently of existing organisations and institutions.

VI.4 Recommendations

1. It is recommended that a Grains Industry Conference (GIC) be instituted, serviced by a Grains Industry Secretariat (GIS) with the following responsibilities, obligations, and authority:

i) The Grains Industry Conference should constitute a group of informed and influential individuals reflecting the variety of individual and entrepreneurial interests in the grains industry, with:

a) the explicit obligation to discount current and established institutional positions and commitments, and to examine objectively the fundamental interests, benefits and burdens in the industry;

b) the responsibility to report back to interest groups and to generate consensus between conflicting interests;

c) the responsibility to generate political support for the direction taken by the Conference;

ii) The Grains Industry Secretariat should consist of established analysts and administrators associated with the industry, responsible to the Conference and with:

a) the responsibility of drafting proposals on the objectives of and constraints on the grains industry and its successful development¹, and on the elements of a policy strategy which would meet these objectives and constraints, drawing on existing research and discussion papers and, where necessary, commissioning further work;

1. An outline of the set of objectives and constraints which are implicit in the analysis and discussion provided in this report is given in the Appendix to this section. This could provide a starting point for the secretariat.

- b) the responsibility of organising meetings of the Conference and drawing up agenda for these meetings;
 - c) the task of drafting a strategic policy framework for agreement by the Conference;
 - d) the authority to draft a policy report incorporating the agreed policy framework and the necessary conditions for its implementation.
2. It is recommended that Grains Group, in consultation with all interested parties, be charged with the responsibility of establishing the GIS/GIC, and with the responsibility to draft the final strategic policy document which reflects the consensus achieved through the Conference.

VI APPENDIX

OUTLINE OF GRAINS INDUSTRY OBJECTIVES AND CONSTRAINTS

1. OBJECTIVES :

The general objectives associated with the grains industry are to generate maximum net incomes and net output of the industry by:

- i) fully exploiting Canadian grain growing and export potential;
- ii) by ensuring that the capacity and operation of the marketing system is responsive to and develops with the progress achieved in grain production and the associated exportable surplus.

2. CONSTRAINTS:

Satisfaction of these objectives is constrained by:

- i) the geographical and physical limitations on the production and on the marketing of the Canadian grain crop;
- ii) the current and future conditions of the international grain markets and of foreign grain-related policies;
- iii) the economic constraints imposed by the opportunity cost of resources (i.e. that the cost of developing the grains industry is appropriately measured by the effect such development has on other sectors of the economy, including taxpayers and consumers);
- iv) the condition that any change be capable of generating sufficient gains to compensate for any real costs imposed on the losers from such a change;
- v) the provision of adequate protection of the distribution of individual incomes, rights and freedoms which cannot be provided, or only provided at higher real (opportunity) cost, from outside the grain production and marketing system.

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(i)

SECTION II

STATISTICAL APPENDIX

TABLE II.1 - Farm Cash Receipts from Grain and Oilseed Production, by Province (\$m)

		Wheat	Oats	Barley	Rye	Flax	Rapeseed	Soybeans	Corn	Total grain and oilseed receipts
Maritimes	1976	-	.48	-	-	-	-	-	-	.48
	77	-	.43	-	-	-	-	-	-	.43
	78	-	.38	-	-	-	-	-	-	.38
Quebec	1976	.975	2.8	.14	-	-	-	-	2.94	6.855
	77	1.05	2.4	.16	-	-	-	-	2.49	6.1
	78	1.52	2.5	.21	-	-	-	-	3.15	7.4
Ontario	1976	80.4	1.85	6.62	.26	-	-	78.1	153.0	320.3
	77	84.2	1.37	5.28	.15	-	-	78.7	153.0	322.7
	78	32.7	1.31	5.55	.19	-	-	139.0	196.0	374.7
Manitoba	1976	244.0	24.0	81.5	6.3	39.9	29.1	-	1.6	444.5
	77	184.0	22.3	70.7	5.0	42.8	54.4	-	1.9	410.8
	78	247.0	16.8	101.0	4.8	53.3	85.7	-	1.0	529.9
Saskatchewan	1976	1300.0	23.4	167.0	12.1	25.3	115.0	-	-	1809.8
	77	1150.0	17.4	126.0	9.5	37.7	203.0	-	-	1669.6
	78	1190.0	12.6	173.0	9.5	40.2	245.0	-	-	1843.3
Alberta	1976	422.0	28.0	237.0	8.9	12.4	80.5	-	-	829.9
	77	374.0	26.0	219.0	7.1	9.7	185.0	-	-	837.2
	78	335.0	21.5	212.0	7.4	7.8	245.0	-	-	893.0
B.C.	1976	5.1	2.6	13.6	-	-	3.3	-	-	24.6
	77	4.6	2.8	15.0	-	-	3.6	-	-	50.6
	78	4.2	1.8	11.5	-	-	9.7	-	-	29.7
CANADA	1976	2060.0	83.2	506.0	27.6	77.5	228.0	78.1	158.0	3426.6
	77	1800.0	72.6	436.0	21.7	90.0	447.0	78.7	157.0	3221.0
	78	1810.0	56.9	503.0	22.0	101.0	585.0	139.0	201.0	3652.9

SOURCE : Market Commentary : Proceedings of 1978 Outlook Conference 1978, Agriculture Canada
1978 figures and projections.

(iii)

TABLE II.2 - The Importance of Grain Production in Generating Farm Cash Receipts

		Total Farm Cash receipts \$m	Grain cash receipts as % of total	Wheat as % of total Wheat Receipts	Barley as % of total Barley Receipts	# Census Farms	Grain Cash Receipts/Farm \$	Total Cash Receipts/farm \$
Maritimes	1976	340.0	.14	0	-	9739	49.3	34911
	77	324.5	.13	0	-		44.1	33319
	78	357.6	.11	0	-		39.2	36718
Quebec	1976	1360.0	.5	.05	.02	43097	159.0	31556
	77	1430.0	.4	.05	.03		141.5	33180
	78	1670.0	.4	.08	.04		171.7	38750
Ontario	1976	2830.0	11.3	3.9	1.3	76983	4160.0	36761
	77	2860.0	11.3	4.7	1.2		4191.0	37150
	78	3370.0	11.1	1.8	1.1		4867.0	43775
Manitoba	1976	891.0	50.0	11.8	16.1	29963	14835.0	29737
	77	899.0	45.7	10.2	16.2		13710.0	30000
	78	1120.0	47.3	13.6	20.1		17685.0	37379
Saskatchewan	1976	2290.0	79.0	67.9	33.0	69578	26011.0	32913
	77	2140.0	78.0	63.9	28.9		23996.0	30757
	78	2480.0	74.3	65.7	34.3		26492.0	35643
Alberta	1976	1850.0	44.8	20.5	46.8	57310	14480.0	32280
	77	1990.0	42.0	20.8	50.2		14608.0	34720
	78	2310.0	38.6	18.5	42.1		15582.0	40300
B.C.	1976	476.0	5.1	.2	2.7	13033	1887.0	36523
	77	502.0	10.1	.3	3.4		3882.0	38517
	78	555.0	5.3	.2	2.3		2279.0	42584
CANADA	1976	10000.0	34.2	100.0	100.0	300118	11417.0	33320
	77	10100.0	31.9	100.0	100.0		10732.0	33650
	78	11900.0	30.7	100.0	100.0		12171.0	39650

SOURCE: As Table II.2, plus Statistics Canada 1976 Census Publications.

Grain cash receipts include oilseed receipts.

TABLE II.3 - Selected Data : 1976 Census. Prairie Provinces

	Man.	Sask.	Alberta	Prairie Total	CANADA
% of total land under crops:	13.6	37.8	27.1	78.5	100.0
% of Provincial total farms as:					
wheat	27.2	66.1	16.3	41.1	22.8
small grains	<u>33.5</u>	<u>15.4</u>	<u>28.4</u>	<u>23.4</u>	<u>18.7</u>
total 'grain' farms	60.7	81.5	44.7	64.5	41.5
% of Canadian total:					
wheat farms	12.1	71.7	13.9	97.7	100.0
small grains farms	18.1	20.3	29.3	67.7	100.0
% of Provincial total farms with sales of :					
> \$75,000	5.7	5.4	7.7	-	7.2
25000 - 74999	26.2	34.9	24.8	-	27.1
5000 - 25000	47.0	47.2	44.9	-	42.4
1200 - 4999	20.9	12.1	22.2	-	23.0
Farms with sales > \$10,000:					
a) as % total per province	62.5	73.7	60.2	-	-
b) % distribution by tenure					
- owner	52.5	48.8	49.2	-	-
- tenant	5.0	5.7	4.8	-	-
part owner/tenant (non-resident)	42.4 (9.6)	45.4 (18.7)	45.9 (8.2)	-	-
c) % of provincial crop land	82.4	89.0	84.0	-	-

SOURCE : Statistics Canada, 1976 Census Reports, 96-800 and 96-862.

TABLE II.4 - Number and Size of Farms, Prairie Provinces

		MANITOBA				SASKATCHEWAN				ALBERTA		PRAIRIE TOTAL	
		Total		Improved		Total		Improved		Total		Farms	
													Permit books
No. of	1961	43,306				93,924				73,212		210,442	223,674
Census	66	39,747				85,686				69,411		194,844	198,054
Farms:	71	34,981				76,970				62,702		174,653	176,886
	76	32,104				70,958				61,130		164,192	157,306
Average	1961	420		276		686		459		645		617	382
size of	66	480		313		763		531		706		685	437
farms	71	543		366		845		603		790		765	502
(acres)	76	593		402		923		659		817		819	542
Total	1961	11,068				41,525				23,709		76,302	
Improved	66	11,925				44,702				26,148		82,776	
Acreage	71	12,313				45,622				27,394		85,329	
('000	76	12,804				46,693				29,136		88,633	
acres)													

SOURCE : Selected Agricultural Statistics, Ag. Canada, 1978.

TABLE II.5 - Cash Receipts on a per farm basis

	Grain Receipts Per Permit Book Holder			Total Farm Cash Receipts Per Census Farm (a)		
	Manitoba	Saskatchewan	Alberta	Prairies	\$/farm	Canada
1961 (b)						
62	2,695	3,967	2,853	6,600		6,080
63	3,250	4,859	2,891			
64	3,638	5,331	3,113			
65	4,358	6,853	4,132			
66	4,832	7,143	4,341			
67	5,549	7,827	5,153	10,767		10,020
68	5,517	8,155	5,644	11,242		10,540
69	5,295	7,428	5,489	11,024		10,813
70 (b)	4,775	5,631	4,285	9,911		10,827
71	3,818	5,225	3,833	9,983		11,216
72	5,014	7,532	5,236	11,806		12,465
73	7,274	10,186	6,264	15,137		15,116
74	9,152	12,787	7,897	19,335		19,355
75	16,440	20,637	15,718	27,195		25,532
76	19,412	26,509	18,450	31,753		29,150
77	17,600	23,919	17,067	30,635		29,647
78	17,600	21,879	18,063	31,167		30,540
	18,737	24,392	17,566	36,936		36,329

(vi)

SOURCES : Selected Agricultural Statistics for Canada, Agriculture Canada 1978.
Proceedings of Canadian Ag. Outlook Conference, Ag. Canada. December 1978.
C.W.B. Annual Report 1977/78.

NOTES : (a) Farm numbers for the inter-census years are linearly interpolated.

(b) These two years (1961 and 1970) are rather more atypical than most. 1961 was a year of very poor yields (see Table 6) while 1970 was affected by the LIFT program which paid producers to take land out of wheat production in an effort to reduce the large stocks of wheat built up during the 1960s.

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TABLE II.6 - Wheat. Farm Prices Received¹, Average Yields and Gross Receipts/Acre

	MANITOBA				SASKATCHEWAN				ALBERTA	
	Farm Price \$/bu	Av. Yield bu/acre	Receipts \$/acre	Farm Price \$/bu	Av. Yield bu/acre	Receipts \$/acre	Farm Price \$/bu	Av. Yield bu/acre	Receipts \$/acre	Receipts \$/acre
1961/2	1.76	11.7	20.6	1.75	8.5	14.8	1.72	15.8	27.2	
62/3	1.70	26.3	44.7	1.67	20.4	34.1	1.62	19.3	31.3	
63/4	1.71	19.3	33.0	1.75	27.5	48.1	1.73	25.1	43.4	
64/5	1.63	25.1	40.9	1.60	18.1	28.9	1.55	22.3	34.5	
65/6	1.65	24.4	40.3	1.70	21.6	36.7	1.64	25.3	41.5	
66/7	1.78	24.3	43.2	1.77	27.7	49.0	1.73	29.4	50.9	
67/8	1.64	25.6	42.0	1.62	17.2	27.9	1.61	22.7	36.5	
68/9	1.31	26.8	35.1	1.34	19.6	26.3	1.31	25.7	33.7	
69/70	1.24	25.6	31.7	1.29	27.0	34.8	1.17	26.4	30.9	
70/1	1.42	21.8	30.9	1.45	26.2	38.0	1.35	27.7	37.4	
71/2	1.37	29.4	40.3	1.35	26.7	36.0	1.30	26.4	34.3	
72/3	1.86	26.5	49.3	1.88	23.5	44.2	1.84	27.4	50.4	
73/4	4.30	25.7	110.5	4.60	24.0	110.4	4.24	27.0	114.5	
74/5	4.00	21.1	84.4	4.33	21.0	90.9	3.96	24.3	96.2	
75/6	3.53	25.2	88.9	3.68	25.5	93.8	3.51	30.0	105.3	
76/7	2.80	27.1	75.9	2.90	31.1	90.2	2.72	32.5	88.4	
77/8	N.A.	31.6		N.A.	29.1		N.A.	24.8		
78/9	N.A.	30.6		N.A.	29.2		N.A.	29.8		

SOURCE : Statistics Canada Handbook of Agricultural Statistics, Part I, Field Crops (1975) and supplementary data from Statistics Canada.

1. Farm prices are estimated by Statistics Canada as the weighted average farm price for all grades for all commercial sales.

TABLE II.7 - Wheat Receipts/acre in Real Terms
\$/acre (1971\$)

	Manitoba	Saskatchewan	Alberta
1961/2	27.5	19.7	36.3
62/3	58.9	44.9	41.2
63/4	42.7	62.3	56.2
64/5	52.0	36.8	43.9
65/6	50.1	45.6	51.5
66/7	51.7	58.7	60.9
67/8	48.5	32.2	42.2
68/9	39.0	29.2	37.4
69/70	33.7	37.0	32.8
70/1	31.8	39.1	38.5
71/2	40.3	36.0	34.3
72/3	47.0	42.2	48.1
73/4	98.0	97.9	101.6
74/5	67.5	72.7	77.0
75/6	64.2	67.7	63.8
76/7	51.0	60.6	59.3
Mean	50.2	48.2	51.5
S.D.	16.9	19.8	18.2
trend correlation coefficient	0.40	0.52	0.47
trend increase per year	1.40	2.15	1.78

SOURCE : As Table II.5 - deflated by the C.P.I.

TABLE II.8 - Average farm prices, yields and nominal and real revenues per acre

	MANITOBA				SASKATCHEWAN				ALBERTA			
	Farm Price	Yield bu/acre	Revenues acre	Real Revenues acre	Farm Price	Yield bu/acre	Revenues acre	Real Revenues acre	Farm Price	Yield bu/acre	Revenues acre	Real Revenues acre
Barley												
1966/7	1.10	32.0	35.2	42.1	1.05	40.4	42.4	50.8	1.03	41.0	42.2	50.5
67/8	0.89	34.0	30.3	35.0	0.85	26.8	22.8	26.3	0.84	32.2	27.0	31.2
68/9	0.79	36.8	29.1	32.3	0.78	31.9	24.9	27.7	0.81	38.3	31.0	34.4
69/70	0.69	35.0	24.1	25.6	0.67	40.4	27.1	28.8	0.62	40.0	24.8	26.3
70/1	0.74	36.0	25.2	25.9	0.79	43.0	34.0	35.0	0.69	42.0	29.0	29.8
71/2	0.70	45.8	32.1	32.1	0.66	45.2	29.8	29.8	0.67	39.4	26.4	26.4
72/3	1.26	40.5	51.0	48.7	1.23	38.5	47.3	45.1	1.26	44.2	55.7	53.1
73/4	2.51	39.5	99.1	87.9	2.52	39.0	98.3	87.2	2.50	39.0	97.5	86.5
74/5	2.22	29.4	65.3	52.2	2.18	31.9	69.5	55.6	2.20	36.9	81.2	65.9
75/6	2.28	34.0	77.5	55.9	2.32	37.1	86.0	62.1	2.31	42.2	97.5	70.4
76/7	2.0	41.9	83.8	56.3	1.95	46.1	89.9	60.4	1.88	45.4	85.3	57.2
77/8		49.5				45.0				45.9		
78/9		48.6				43.2				45.1		
Rapeseed												
1966/7	2.45	12.4	30.4	36.4	2.45	17.4	42.6	51.0	2.50	17.6	44.0	52.7
67/8	1.92	15.9	30.5	35.3	1.94	17.0	33.0	38.1	1.91	13.9	26.5	30.6
68/9	1.88	20.9	39.3	43.7	1.84	19.6	36.1	40.1	1.80	16.7	30.1	33.4
69/70	2.40	17.9	43.0	45.7	2.25	18.2	40.9	43.4	2.32	16.3	33.2	35.3
70/1	2.32	18.0	41.8	43.0	2.35	18.0	42.3	43.5	2.30	17.6	40.5	41.7
71/2	2.15	20.7	44.5	44.5	2.15	18.6	40.0	40.0	2.19	16.1	35.3	35.3
72/3	3.10	18.1	56.1	53.5	3.22	16.5	53.1	50.7	3.12	18.5	57.7	55.1
73/4	5.84	19.2	112.1	99.5	5.69	16.6	94.4	83.8	5.70	16.5	94.0	83.4
74/5	7.07	17.0	120.2	96.2	7.05	16.0	112.8	90.2	7.08	16.2	114.7	91.8
75/6	5.11	16.7	85.3	61.6	5.01	18.5	92.7	66.9	5.18	17.9	92.7	66.9
76/7	5.82	18.0	104.8	70.4	6.10	22.8	139.1	93.4	6.11	19.7	120.4	80.8
77/8		25.6				22.5				22.9		
78/9		24.3				22.9				21.0		

(ix)

SOURCE : As Tables 5 and 6.

TABLE II.9 - Yield and Real Revenue Statistics, Prairie Provinces

	MANITOBA			SASKATCHEWAN			ALBERTA		
	Yield (bu/acre)	Revenues (\$/acre)		Yield (bu/acre)	Revenues (\$/acre)		Yield (bu/acre)	Revenues (\$/acre)	
1. Wheat: Mean	26.2	52.1		25.2	52.1		27.2	54.17	
S.D.	3.0	18.9		4.0	21.3		2.67	21.2	
trend correlation coefficient	0.44	0.46		0.51	0.57		0.36	0.49	
trend change per year	+0.34	+2.62		+0.53	+3.70		+0.24	+3.13	
2. Barley: Mean	38.7	44.9		39.1	46.3		40.9	48.3	
S.D.	6.32	17.4		5.89	19.2		3.9	20.4	
trend correlation coefficient	0.59	0.60		0.47	0.63		0.65	0.63	
trend change per year	+0.96	+3.3		+0.70	+3.52		+0.64	+3.89	
3. Rapeseed: Mean	18.8	57.2		19.0	58.3		17.8	55.2	
S.D.	3.47	22.6		2.91	21.4		2.35	22.3	
trend correlation coefficient	0.62	0.73		0.61	0.79		0.73	0.77	
trend change per year	+0.56	+5.0		+0.46	+5.14		+0.44	+5.18	

NOTES : Yield figures measured over period 1966/7 to 1978/9 in all cases.

Real Revenue figures measured over period 1966/7 to 1976/7 in all cases, where real revenues are yield times price deflated by the C.P.I. (1971 = 100).

(x)

TABLE II.10 - Acreage of Principal Grains in the Western Canadian Provinces 1954 to 1978

	Wheat	Oats	Barley ('000s acres)	Rye	Flaxseed ²	Rapeseed ³	Total	Summer Fallow
1961	24,716	5,211	5,424	495	2,054	710	38,610	27,860
1962	26,330	7,240	5,177	571	1,398	371	41,087	27,696
1963	27,090	6,338	6,042	634	1,630	478	42,212	27,384
1964	29,200	5,136	5,325	637	1,918	791	43,007	26,560
1965	27,892	5,705	5,893	745	2,267	1,435	43,937	26,671
1966	29,293	5,491	7,160	674	1,885	1,525	46,028	25,224
1967	29,671	5,157	7,780	631	999	1,620	45,858	25,950
1968	29,018	5,418	8,500	622	1,503	1,052	46,113	26,660
1969	24,550	5,506	8,970	786	2,321	2,012	44,145	28,800
1970	12,075	5,320	9,480	767	3,300	4,050	34,992	36,900
1971	18,994	5,405	13,508	907	1,762	5,306	45,882	26,224
1972	20,915	4,723	12,050	583	1,320	3,270	42,861	29,000
1973	23,215	5,370	11,520	584	1,450	3,150	45,289	26,500
1974	21,570	4,865	11,370	804	1,450	3,160	43,219	27,900
1975	22,855	4,710	10,590	747	1,400	4,320	44,622	27,300
1976 ¹	27,165	4,738	10,302	550	800	1,778	45,333	26,600
1977 ¹	24,275	4,220	11,330	566	1,470	3,590	45,451	27,100
1978 ¹	25,670	3,460	10,060	733	1,280	6,930	48,133	25,300

(xi)

NOTES : 1. Subject to revision

2. Flaxseed acreage for British Columbia not available 1972 to 1978.

3. Rapeseed acreage for British Columbia not available 1954 to 1973.

SOURCE : C.W.B. Annual Report 1977/78 and Handbook of Ag. Stats. Part 1 Field Crops - Stat. Can.

TABLE II.11 - Marketings as per cent of production (Western Canada)

	Production (m.tonnes)	Wheat Marketings (m.tonnes)	Marketings as % of Production	Barley Marketings as % of Production	Rapeseed Marketings as % of Production
1960/61	13.6	10.8	79	46	86
61/2	7.1	8.3	117	55	89
62/3	14.9	12.9	86	50	97
63/4	19.2	15.5	81	43	89
64/5	15.8	14.3	90	47	82
65/6	17.3	15.5	89	45	83
66/7	22.1	17.2	78	40	80
67/8	15.7	12.4	79	37	81
68/9	17.2	11.5	67	27	91
69/70	17.8	11.2	63	48	85
70/1	8.6	10.4	121	61	85
71/2	14.0	14.1	101	51	73
72/3	14.0	17.2	123	48	110
73/4	15.7	14.6	93	52	82
74/5	12.7	11.5	90	54	80
75/6	16.4	14.3	87	52	80
76/7	22.8	14.9	65	58	123
77/8	18.9	19.1	101	46	89
78/9	20.6				

SOURCE : CWB Annual Report, 1977/78

TABLE II.12 - Grain expenses and receipts (calendar year basis)

	Cash Expenses/acre (a)		Grain Proceeds/acre (b)		Margin/acre	
	\$/seeded acre	\$/seeded + s.f. acre	\$/seeded acre	\$/seeded + s.f. acre	\$/seeded acre	\$/seeded + s.f. acre
1971	11.1	7.1	35.1	22.3	23.9	15.2
1972	12.8	7.6	51.6	30.8	38.8	23.2
1973	16.1	10.2	64.5	40.7	48.4	30.5
1974	20.8	12.6	108.7	66.0	87.9	53.4
1975	26.8	16.6	105.3	65.3	78.5	48.7
1976	29.7	18.7	91.7	57.8	62.0	39.1
1977	32.0	20.0	84.9	53.2	52.9	33.2
1978	35.3	23.2	79.2	51.9	43.9	28.7

(a) Cash expenses derived from W.G.S.A. Annual Reports, Handbooks, and personal contact with the W.G.S.A. administration. Gross figures in \$m. divided by seeded acres and seeded + summer fallow acres for the Prairie provinces for the 6 major grains (to which the program refers).

(b) Gross proceeds from the sale of grain, from W.G.S.A. sources, adjusted by a marketing to production ratio and expressed on a per acre basis as above. Note that the marketing to production ratio used by the W.G.S.A. administration is considerably more complex than the simple one shown in Table 11, it takes into account stock changes and between year yield variations.

TABLE II.13 - Revenues, Costs and Returns, West Central Saskatchewan (1975)

\$ per improved acre unless otherwise specified	Small Farms (600 acres)		Medium Farms (12000 acres)		Large Farms (2400 acres)	
	Loam	Clay Loam	Loam	Clay Loam	Loam	Clay Loam
Average receipts	56.1	53.9	54.4	51.6	51.6	56.1
Crop Costs, Labour, Depreciation, taxes, overheads	28.4	27.4	20.9	21.6	19.1	19.0
Margin	27.7	26.5	33.5	30.0	38.5	37.1
Interest on Capital @ 8%	21.9	22.9	19.9	21.1	18.7	20.0
Surplus to Management	5.8	3.6	13.6	8.9	19.8	17.1
Surplus as % of Average Receipts (%)	10.3	6.7	25.0	17.4	34.0	30.0
To drive Surplus to Management to zero:						
a) increase interest rate to (%)	10.1	9.2	13.5	11.4	16.5	14.9
b) increase equity by (%)	26.0	15.8	68.0	42.7	106.0	86.0

SOURCE : Johnson (1977) and authors calculations

(xv)

TABLE II.14 - Prairie Grain Receipts, Tractor Sales, and Land Price Indices

	Prairie Grain Receipts		Wheeled Tractor Sales,		Land Price Indices (1961 = 100)		
	\$m		Western Canada,	\$m	Manitoba	Saskatchewan	Alberta
1962	855.8		45		102	108	106
63	911.9		60		109	127	116
64	1147.2		75		122	149	129
65	1177.2		77		139	178	149
66	1281.8		95		152	205	165
67	1304.9		90		169	227	184
68	1210.6		65		180	232	200
69	950.4		55		167	205	196
70	818.8		40		156	189	186
71	1109.1		50		154	187	182
72	1423.8		80		154	187	184
73	1738.8		125		176	216	208
74	2910.8		150		224	270	267
75	3558.8		225		256	351	326
76	3219.7		270		298	427	359
77	3048.8		240		319	443	373
78	3410.3		275				

SOURCES : (a) Statistics Canada - Farm Cash Receipts 21-001
 (b) Outlook Conference Report - Farm Inputs, Agriculture Canada, Dec. 1978
 (c) Agriculture Credit Statistics, Farm Credit Corporation, Ottawa, 1978.

TABLE II.15 - Total Supplies and Disposition of Canadian Grains

		Total Supplies m.tonnes	% Distribution to Domestic Disappearance Farm Commercial		Exports	Closing
<u>Wheat</u>	1975/6	25.1	9.5	9.8	48.9	31.8
	76/7	31.6	8.0	7.3	42.5	42.2
	77/8	33.2	6.6	7.8	48.2	37.3
	78/9 ^p	33.2		16.0	40.1	43.4
<u>Barley</u>	1975/6	13.6	35.6	12.3	31.9	20.3
	76/7	13.3	34.9	12.2	28.6	24.2
	77/8	15.0	29.7	10.9	23.9	35.4
	78/9 ^p	15.7		44.6	24.2	31.2
<u>Rapeseed</u>	1975/6	2.24	7.5	15.6 ¹	30.5	46.4
	76/7	1.88	5.9	29.3	54.2	10.6
	77/8	2.17	7.6	29.1	46.6	16.7
	78/9	3.84	9.1	18.2	44.0	28.7
<u>Flaxseed</u>	1975/6	0.66	13.1	-	29.4	57.5
	76/7	0.66	17.3	-	50.6	32.1
	77/8	0.86	14.7	-	29.1	56.1
	78/9	1.04	18.3	-	48.0	33.6
<u>Corn</u>	1975/6	4.39	72.7	19.0	5.3	2.9
	76/7	4.64	76.9	16.3	3.8	2.9
	77/8	4.84	73.8	15.7	6.7	3.7
	78/9	4.81		92.6	3.6	2.8
<u>Soybeans</u> ²	1975/6	0.76	-1.0	95.0 ¹	2.9	3.1
	76/7	0.67	-11.1	103.0	3.6	4.5
	77/8	0.81	-5.0	91.6	8.0	5.4
	78/9	n.a.	n.a.	n.a.	n.a.	n.a.

SOURCES : C.W.B. Annual Report, 1977/78.
Canadian Grains Industry Statistical Handbook.
Canada Grains Council, 1978.
Market Commentary, Ag. Canada, July 1979.

1. Commercial disappearance of oilseeds = crushings.
2. Soybean balance sheet has some problems in that farm disappearance (a residual item) has been significantly negative for the last three years and, on occasion, before that.

p = Provisional

TABLE II.16 - Exports of Wheat and Flour by Principal Exporters:
Percentage of World Trade

	Total World Trade m.tonnes	Argentina	Australia	Canada	U.S.	Other	World Trade as % of World Production
1958/9 to 1962/66	41.24	5.4	10.2	21.0	38.9	24.5	
<u>Average</u>							
1963/4	56.8	4.9	13.8	28.4	40.6	12.3	23.8
64/5	49.4	9.0	13.1	21.9	39.6	16.4	17.9
65/6	63.1	12.6	9.0	25.2	37.1	16.1	23.8
66/7	55.1	5.5	12.7	25.4	36.6	19.8	17.8
67/8	51.7	2.6	13.6	17.7	39.7	26.4	18.0
68/9	45.6	6.1	11.8	18.2	33.0	30.9	13.9
69/70	51.4	4.1	14.1	18.2	32.7	30.9	16.6
70/1	54.8	3.1	17.3	21.6	36.7	21.3	17.4
71/2	52.5	2.5	16.7	26.1	32.2	22.5	15.0
72/3	68.0	5.2	8.2	23.0	46.6	17.0	19.8
73/4	62.9	1.8	8.7	18.1	49.7	21.7	16.9
74/5	62.6	3.5	12.9	17.1	44.7	21.8	17.5
75/6	66.8	4.6	12.1	18.4	47.4	17.5	19.0
76/7	61.8	9.0	13.5	21.8	40.7	15.0	14.9
77/8	72.1	13.6	15.4	22.2	41.5	17.3	18.9

SOURCE : C.W.B. Annual Report 1977/78 and I.W.C. Wheat Statistics 1978.

TABLE II.17 - World Coarse Grain Trade¹: Exports Expressed as a Percentage of Total Exports
(year beginning July 1st)

Crop year/Country	Canada	Australia	Argentina	United States
1963/64	3.4	2.0	10.6	45.3
64/5	2.4	2.1	13.9	48.4
65/6	2.2	1.1	8.2	56.5
66/7	2.5	2.0	15.1	48.4
67/8	2.6	0.7	9.5	46.5
68/9	1.2	2.1	13.6	38.9
69/70	2.9	2.0	13.8	44.2
70/1	7.9	4.3	15.0	38.1
71/2	8.0	5.8	11.2	38.0
72/3	6.2	2.5	6.5	55.4
73/4	3.4	2.4	10.5	56.1
74/5	4.3	5.0	13.3	53.8
75/6	6.3	4.1	6.9	60.4
76/7	5.5	3.9	12.9	60.5

SOURCE : USDA, Foreign Agricultural Circular FG, various issues.

1. Comprising Barley, Sorghum, Corn and Oats.

TABLE II.18 - Variability of World Trade :
(Coefficients of Variation from log-linear trends 1960-78)

	World Production	World Utilization	Total Trade	U.S. Price
Wheat	5.2	3.2	8.65	29.8
Wheat plus coarse grains	3.36	2.48	8.64	19.25 ¹

SOURCE : Ellinson, and author's calculations.

NOTE : 1. Coefficient of variation of the US corn price.

TABLE II.19 - Variability of Production :
(Coefficients of Variation from trends 1960-1973,
selected countries)

	World	Export- ers	U.S.	Canada	Argen- tina	Aust- ralia	USSR	China	EEC
Wheat	4.7	9.1	7.9	25.3	2.8	27.1	14.2	7.6	7.2
Coarse grains	3.3	6.6	7.7	12.8	16.3	24.2	11.1	7.0	4.0

SOURCE : W. Scott Steele, "Grain Market Instability and Stocks Levels",
FDCD Working Paper, E.R.S. - U.S.D.A., 1974.

TABLE II.20 - Time Trends of Wheat and Other Grains Production, Canada
(m.tonnes)

	1976/7		Actual Production 1976/7	1985/6	
	Trend Predictions of Production			Trend Prediction	
	i) acreage x yield	ii) production		i) acreage x yield	ii) production
Wheat	17.85	17.86	23.52	20.0	20.1
Other grains and oilseeds	22.4	21.1	21.6	30.2	26.1
Total grain and oilseeds	39.1	39.0	45.1	50.2	46.2

SECTION IV APPENDIX I

Effects of W.G.S.A.¹ (Illustrative)

(assuming continuous operation since 1971,
with eligibility of 100% throughout)

Year	1971	1972	1973	1974	1975	1976	1977	1978	Average
(1) Net grain receipts per permit book holder (\$)									
with plan :	3,490	4,867	6,277	11,297	10,053	8,302	8,524	9,089	7,737
without plan :	3,612	5,023	6,494	11,753	10,486	8,677	7,857	7,360	7,658
Gain or loss due to plan :	-122	-156	-216	-455	-433	-372	+667	+1,729	+80
(2) Levy per permit book holder	122	156	216	455	433	372	373	403	316
(3) Government payment to fund per p.b.h.	244	310	432	910	866	744	746	806	632
(4) Net receipts per cropped acre ²									
with plan :	8.56	11.60	14.55	25.37	22.11	18.16	18.08	18.76	17.15
without plan :	8.86	12.00	15.05	26.40	23.06	18.98	16.66	15.19	17.02
difference :	-0.30	-0.40	-0.50	-1.03	-0.95	-0.82	+1.42	+3.57	+0.13
(5) Approximate effect on ³									
(a) Land prices (change in price \$/acre)	-0.2	-0.3	-0.4	-0.7	-0.6	-0.5	+0.9	+2.2	+0.40
"long run"	(-1.43)	(-2.4)	(-2.8)	(-5.0)	(-4.3)	(-3.6)	(+6.4)	(+15.71)	(+0.32)
(b) Investment in machinery									
i) (change in \$/acre invested)	-0.1	-0.1	-0.1	-0.3	-0.3	-0.3	+0.5	+1.5	+0.80
ii) as % of total machinery capital	-0.3%	-0.4%	-0.5%	-1.2%	-1.1%	-0.7%	-1.7%	n.a.	

- NOTES : 1. Net grain receipts are calculated as gross grain receipts less net cash expenses without allowing for eligibility ratios (i.e. assuming these to be 100%), divided by the total number of permit book holders. With the plan in effect, producers levies are also deducted from net grain receipts, while any payout from the plan is added in. (Eligibility ratios actually declined from 90% in 1971 to 66% in 1978).
2. The figures per cropped acre refer to the total net receipts divided by the area seeded to the six major grains plus the summer fallow acreage.

SOURCE : W.G.S.A. information literature, Agriculture Canada, and internal working papers, Agriculture Canada.

(ii)

Notes on Table IV.4.1 (continued)

3. The approximate effects on land prices and on machinery investment per acre are exploratory calculations based on econometric equations estimated by MacMillan, Kraft and Ford. The two equations are:

$$\begin{aligned} \text{a) Land Price } P_t &= -1.00 + 0.24 (R/i)_{t-1} + 0.86 P_{t-2} \\ &\quad (8.17) \quad (12.77) \\ R^2 &= 0.98 \text{ DW} = 2.31 \text{ (estimation period: 1946-1974)} \end{aligned}$$

$$\begin{aligned} \text{b) Machinery Investment } I_t &+ 3.99 + 0.18 C_t + 0.51 I_{t-1} - 0.14 K_{t-1} \\ R^2 &= 0.81 \text{ DW} = 1.58 \text{ (estimation period: 1954-1974).} \end{aligned}$$

where t statistics are shown in parentheses and where :

P_t = Manitoba average land price \$/acre;

R_t = rent per acre (1/3 of total cash receipts);

i = effective interest rate;

I_t = annual investment in machinery (\$ per improved acre);

C_t = net cash flow, 1961 \$ per improved acre;

K_t = capital stock of farm machinery per improved acre, 1961 \$/acre.

In using these results to obtain the estimates shown in the table, grain cash receipts were multiplied by 0.25 rather than 0.33 to get rent per acre (to reflect the grain only measurement of receipts). The interest rate used is the F.C.C. loan rate. Using these approximations the equation (a) above was used to generate the change in land prices consequent on the plan, the figures in parentheses being the "long run" equivalents, by taking account of the lagged endogenous variable. In fact this figure is of very limited interest in that it assumes combined levies/payouts at the same level as in the current year, which is not very reasonable. Equation (b) was used by converting the net cash flow per acre figures to constant 1961 dollars and applying the parameter on C_t , equation (b). The final row of the table shows the change in machinery investment from equation (b) converted to current \$ and expressed as a % of total prairie machinery capital values (Selected agricultural statistics, Agriculture Canada, 1979).

SECTION IV - APPENDIX 2

THE QUOTA : SOME SIMPLE ANALYTICS

The quota serves three purposes :

- a) ensures equality of access to delivery system for producers (equality being defined in terms of assigned acres);
- b) helps in scheduling deliveries;
- c) may be used to restrict total deliveries in a year, thus building stocks or diverting grain to the domestic market.

The third of these purposes has the potential of causing the most serious economic distortion. It is also of current concern since the capacity limits of the G.H.T.S. are resulting in restrictive quotas again, after a period of open quotas.

Comparative Statics

let the quota = qL (q is level of quota/acre and L is the assigned farm acreage)

quota sales price = P_1 , for sales Q_1 ($\leq qL$)

Off Board price = P_2 , for all other sales, Q_2

two inputs other than land, X_1 and X_2 , (which may be labour and capital).

Profit = $P_1 Q_1 + P_2 Q_2 - C_1 X_1 - C_2 X_2 - C_3 L$

with C_1, C_2, C_3 being the costs of inputs, including the implicit or explicit rent for land to the farm-firm.

with a production function $Q = Q_1 + Q_2 = f(X_1, X_2, L)$

thus $qL + \{f(X_1, X_2, L) - qL\} = Q$.

(ii)

To maximise profit, Max

$$\Pi^* = P_1 qL + P_2 [f(X_1, X_2, L) - qL] - C_1 X_1 - C_2 X_2 - C_3 L$$

$$\delta \Pi^* / \delta X_1 = P_2 f_1 - C_1 = 0 ; P_2 f_1 = C_1$$

$$\delta \Pi^* / \delta X_2 = P_2 f_2 - C_2 = 0 ; P_2 f_2 = C_2$$

$$\delta \Pi^* / \delta L = P_1 q + P_2 (f_3 - q) - C_3 = 0 ; q(P_1 - P_2) + P_2 f_3 = C_3$$

This formulation assumes that the quota is restrictive and that production of Q_1 is given and fixed at qL . Further production will only take place if the marginal products of the factors valued at the Off-board price are sufficient to justify the cost of those inputs.

The difference between the gross revenue per acre from Board and non-Board sales ($q(P_1 - P_2)$) appears as an additional justification for the rent of land.

If $P_1 > P_2$, and if, with no quota, the common price between board and non-board would be P_1 , then given constant input costs, more inputs (X_1 and X_2 and Land) would be used under profit maximisation with no quota than with the quota (exactly similar to usual comparative static result of higher output prices leading to greater input use and more output). At first sight, the result that the quota reduces the profit maximising level of land input seems counter intuitive, - the conventional wisdom is that the quota system results in more extensive use of land. However, the above results do show that, for given input costs, including rent, the ratio of land's marginal product to that of other factors is changed from the profit maximising position, and does indicate more extensive

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use of land. With the quota, the marginal price received for grain production is the off-board price which, if assumed to be lower than the board price, will lead to lower production levels and less inputs used under profit maximisation. If off-board prices are sufficiently low or if input costs are sufficiently high, then no off-board grain will be produced - the firm's profit maximisation problem then becomes:

$$\text{Max } P_Q - C_1 X_1 - C_2 X_2 - C_3 L$$

$$\text{St. } Q = f(X_1, X_2, L)$$

$$Q = qL$$

$$\text{hence: } \text{Max } \Pi = P f(\) - C_1 X_1 - C_2 X_2 + \lambda(qL - f(\))$$

$$\delta \Pi^* / \delta X_1 = P f_1 - C_1 - \lambda f_1 = 0 ; C_1 = (P - \lambda) f_1$$

$$\delta \Pi^* / \delta X_2 = P f_2 - C_2 - \lambda f_2 = 0 ; C_2 = (P - \lambda) f_2$$

$$\delta \Pi^* / \delta L = P f_3 - C_3 + \lambda(q - f_3) = 0 ; C_3 = \lambda q + (P - \lambda) f_3$$

Given costs C_1 and C_2 , less of factors X_1 and X_2 will be used with the quota than without it. Also, given C_3 fixed for the present, and so long as $q < f_3$, the marginal product of land used will be higher with the quota than without it (i.e. implying less land used under the quota). However, again given no change in input costs including rent, the ratio of land marginal product to other input marginal products does indicate more extensive use of land (i.e. more summer fallow, less fertilizer etc.).

Thus the simplistic profit-maximising analysis suggests that on effective, limiting, quota results in:

- a) Less grain output than under profit max. with no quota (given $P_2 < P_1$ and P without quota $> P_2$)
- b) Land used more extensively than under profit maximisation with no quota.

At the industry level, however, an assumption of fixed rents is no longer tenable. To the extent that rents are lower under quotas than without, then more land will be used with the quota than without and will be used more extensively.

SECTION V : APPENDIX 1

BRANCH LINE REHABILITATION

It is generally recognized that the current rail network, particularly the 'branch lines' or collector system, in Western Canada has suffered from 'deferred maintenance', that it has been deteriorating and, unless something is done, will continue to deteriorate until it becomes unuseable. Thus, the fact that some rehabilitation of the network is necessary and vital is not in dispute. The question is how much should be spent? A subsequent question is: on what criteria should expenditures (equivalent approximately to degree of upgrading) be based?

One may picture three broad levels of rehabilitation:

- I. Rehabilitate so that the current system is capable of being maintained in an 'ongoing' state, i.e. with some bare minimum operating standards with respect to weight of cars, locos, length of train, maximum speeds, etc.;
- II Rehabilitate lines to their 'original operating specifications', which in many cases will be higher than under I above;
- III Rehabilitate/upgrade lines to a 'modern/reasonable' operating specification, loosely interpreted as being sufficient to handle current large scale equipment (steel hopper cars, large locos etc.) year round (i.e. no spring 'half load' type restrictions etc.)

(ii)

and with no significant restrictions on sizes,
speeds or frequency of trains.

Cost Estimates

1. Ongoing System

The Snavely Commission (Volume 1) included as an item in the costs the depreciation and capital costs associated with the 'grain dependent lines', plus an estimate of the 'unspent' portion or shortfall in these items of expenditure which would have been necessary to maintain the 1974 system "on an ongoing basis" (pages 123-127 Volume 1). These figures are reproduced in Table 1 and averaged over the miles of grain-dependent lines.

2. Original Operating Standards

The Snavely Commission also received from the railways an estimate of the costs required to "rehabilitate the entire grain dependent line system to its original operating standards" (pages 127 and 128 Volume 1). These costs were not included in the Snavely Cost figures but they are as follows in Table 2. Since they were not included by Snavely, one may infer that these costs are over and above those in Table 1.

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TABLE 1 - Ongoing System Operating, Depreciation, and Capital Costs
Grain Dependent Lines (Snively) \$ m. (1974)

Item	CP	CN	Total
Operating Costs	6.029	8.270	
Maintenance Shortfall	8.688	3.969	
Total Operating Costs	14.717	12.239	
Depreciation	2.625	1.920	
Depreciation Shortfall	0.061	0.087	
Total Depreciation	2.686	2.007	
Capital Funds Cost*	15.217	13.648	
Capital Funds Shortfall	0.637	0.922	
Total Capital Funds	15.854	14.570	
Total Cost \$ million	33.257	28.816	62.073
\$ mile (8817.0)		(8588.7)	(8709.7)
Total Shortfall \$ million	9.386	4.978	14.364
\$ mile (2488.5)		(1483.7)	(2015.5)
Miles of G.D. Line	3771.8	3355.14	7126.94

SOURCE : Snively Commission Report, Vol. I, Appendices H and K.

* Capital funds rate = 20.8 per cent for both railways.

NOTE : Snively distinguishes between "Volume related" and "Line related" costs. The distinction is not retained in this table, total \$ m costs are used.

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TABLE 2 - Rehabilitation Costs to get to Original Operating Standards
(Railway estimates 1974 \$)

	Total Capital Cost	\$/mile G.D. line	Annual Cost* \$/mile
CN	171.4	51,086**	11,647.6
CP	98.1	26,009	5,930.0
Total	269.5	37,814	8,621.6

* Annual cost calculated as interest at 20.8 per cent and depreciation at 2 per cent per year, (life span 50 years). This would allow replacement when fully depreciated, and assumes sufficient maintenance to sustain a minimum 2 per cent depreciation rate.

** This figure differs from the one given in the Snively Report.

3. Combination Upgrading and Rehabilitation

These figures are even more slippery and fuzzy than the ones above. The basic documentation in this case is the Hall Commission report, Volume 1.

The basic information supplied by Hall is contained in Tables X-8 and X-9 (pages 327 and 328 of Volume 1 respectively). These are reproduced below as Tables 3 and 4.

Averages per mile of track involved cannot be easily obtained for Table 3, and would probably not make very much sense in any event. The interesting thing to note from this table is that the railway estimate of complete upgrading and rehabilitation of the entire system (\$ 539m) is some 23 per cent below the estimate of the Commission, implying that the railways were using less exacting operating specifications than the Commission or lower cost components for some reason.

The report does make it clear why this difference appears.

TABLE 3 - Estimates of Capital Required (1974 Dollars in Millions)

	Upgrading the Complete Existing Network		Combination of Upgrading and Rehabilitating the Complete Existing Network		To Provide the Adequate Network-Configuration Recommended by the Commission
	According to Rly. Companies	According to Commission	According to Rly. Companies	According to Commission	According to the Commission Estimate
CN	1204.7	758.4	360.4	524.1	297.5
CP	532.7	615.8	176.7	160.9	133.0
NAR	8.3	14.5	2.1	14.5	14.5
Total	1745.7	1388.7	539.2	699.5	445.0

TABLE 4 - Commission Estimate of Rehabilitation and Upgrading Funds Required to Provide an Adequate Network for the Future
(1974 dollars in Millions)

	<u>Grain Dependent Lines</u>		<u>Non-Grain Dependent Lines</u>		Total
	Cat. A	Cat. B	Cat. A	Cat. B	
CN	11.6	117.3 (21.4)	146.6	22.0 (2.6)	297.5 (24.0)
CP	52.3	25.8 (14.2)	48.7	6.2 (1.5)	133.0 (15.7)
NAR	-	-	3.7	10.8	14.5
Total	63.9	143.1 (35.6)	199.0	39.0 (4.1)	445.0 (39.7)

NOTE : The numbers in brackets are estimates included for rehabilitation expenditures estimated for lines which would be transferred to the Prairie Rail Authority according to the Commission's requirements.

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From Table 4, a total of \$142.4 m is estimated by the Commission to be required for rehabilitation and upgrading of the Category B lines in the adequate network (less those transferred to P.R.A.C.). It is assumed that the mileage of lines in this category is the same as that recommended for transfer to the basic network (and subsequently protected until 2000), i.e. 1,812 miles. The average per mile is then \$78,587 for these Category B lines.

Incidentally, the inclusion in this table of a total capital requirement of \$234 m (excluding PRAC lines) for rehabilitation of "non-grain dependent" lines raises the interesting question of how much of this money (assuming it is all to be spent) should come from the Federal Government as 'compensation' to the railways for the Crow-related shortfall, accelerated depreciation etc. Presumably this money is needed to upgrade trackage which carries a significant volume of other traffic (i.e. not grain-dependent), in which case the railways ought to be expected to pay at least a part of this expense, if not all of it, since they are presently allowed to set essentially market rates on this other traffic. Even grain dependent lines are not solely grain lines (around 10 per cent of total originating and terminating traffic on these lines in 1974 was traffic other than statutory grain).

At this point, however, all that has been established is that there are, at least on average and according to the available data, differences in the costs associated with the basic options of rehabilitation (I, II and III) above and that these differences are significant enough that some attention should be paid to the possible

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operating and maintenance cost savings associated with the various levels of upgrading. The next section turns to this question.

Costs and Benefits of Upgrading Etc. (Preliminary)

The appropriate criterion on which to judge the necessary rehabilitation and upgrading to carry out on any line from the railway's point of view is presumably the extent to which the rehabilitation costs will be offset by ongoing operating and maintenance cost savings. This section deals briefly with this criterion in relation to options I and III above. It is extremely tentative because of the absence of detailed data but does, perhaps, provide some directions.

a) Option I, rehabilitate to an ongoing state

This option is fairly clear cut in terms of the criterion. Failure to rehabilitate to an ongoing state will, by definition, result in a decaying system, i.e. one on which operating costs climb astronomically to an infinite (i.e. non-use) level. In this case, then, expenditures to get the line to an ongoing state (once the decision on actual retention of the line has been made) will obviously be justified by operating cost savings and quantification of this option is not necessary.

b) Option III, upgrade existing lines

In this case the answer is not clear cut. The testimony before the Snavely Commission by Loram International provided some average estimates over 11 'representative' subdivisions of the cost per mile

(viii)

of upgrading existing track to various levels of operating standards (approximated by the weight of line). From the Snavely Commission report, Volume 1 it is possible to derive some estimates of differential operating and maintenance costs by line type (see Harvey (1977) op. cit.). Using these figures (with their attendant caveats etc.) it is possible to itemize the following operating and maintenance cost savings (1974 dollars):

TABLE 5 - Operating and Maintenance Costs by Line Type
(Derived from Snavely)

Line Category (weight limit)	Train operating costs \$/ '000 bushel-miles	Maintenance Costs \$/mile/year
1) 176,000 lbs	0.1706	8,710
2) 220,000 lbs	0.1365	8,857
3) 263,000 lbs	0.0569	8,417

The savings, in \$/mile, implied by these figures resulting from upgrading from the light lines (176,000 lbs (60 lb rail)) to the 80 and 100 lb rail types can be represented as follows :

TABLE 6 - Operating and Maintenance Cost Savings from Upgrading
(in \$/mile/year)

a) line (1) to line (2)	=	-147 + 0.0341* '000 bushels originated
b) line (1) to line (3)	=	293 + 0.1137* '000 bushels originated

Obviously, as Hall pointed out, a key factor is density of traffic ('000 bushels originated).

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Table 7 shows the results of applying these crude savings functions to selected levels of grain originations (densities of traffic).

Table 8 compares these savings with the estimated capital costs incurred in upgrading, from the Loram testimony. The Loram testimony gave three sets of upgrading costs. Table 8 uses the middle of the Loram estimates (or the so-called 'maximum' cost excluding overheads, and expresses the savings as a percentage (or simple rate of return) of these capital costs, for each of the two levels of upgrading considered here.

TABLE 7 - Density in Gross Tons/mile

Category	Mean Density (assumed)	Density in ² '000 bushels /mile	Annual operating and maintenance savings \$/mile	
			1-2	2-3
1) 50,000	30,000	523.6	-129.1	352.5
2) 50,000-99,999	75,000	1309.0	-102.0	442.0
3) 100,000-149,999	125,000	2181.6	-72.0	541.0
4) 150,000-249,999	200,000	3490.6	-28.0	690.0
5) 250,000-499,999	375,000	6544.8	76.0	1037.0
6) 500,000-999,999	750,000	13089.6	299.0	1781.0
7) 1 m - 1.99 m	1.5 m	26179.2	746.0	3269.0
8) 2 m - 4.99 m	3.5 m	61084.8	1936.0	7238.0
9) 5 m - 9.99 m	7.5 m	130896.0	4316.0	15176.0
10) 10 m	12 m	209,433.6	6995.0	24106.0

1. Categories taken from Cost Profile Categories developed by Snavely.
2. Density in '000 bushels/mile = Density in Gross tons/mile * 6 * 36.36 * % of Statutory grain to total originations (assumed to be 80 per cent in all cases). This calculation is derived from a) ratio of net to gross ton miles, system average = .6 approx., b) average bushels per net ton = 36.36, and an assumption that the cost savings generated will apply only to bulk (grain) movements.

(x)

TABLE 8 - Cost Savings as a Percentage of Upgrading Cost

Density Category	Annual Savings as % of Capital Cost of Upgrading		% of Total Grain movements origin- ating in density category*
	Line type 1-2 (capital cost = \$48,829/mile)	Line type 1-3 (capital cost = 131,593/mile)	
1	(negative)	0.27	2.08
2	(negative)	0.34	5.31
3	(negative)	0.41	7.52
4	(negative)	0.52	12.86
5	0.16	0.79	18.93
6	0.61	1.35	11.62
7	1.53	2.48	6.3
8	3.96	5.5	14.62
9	8.8	11.5	8.31
10	14.3	18.32	12.45
			<hr/> 100 %

* These percentages of total grain movements originating in each category apply to both railways combined and are taken from Snavely Commission Data. (They are taken as percentages of grain traffic covered in this classification only, which is somewhat less than the total grain traffic in 1974, actually around 87 per cent of the total movement.)

Note on Cost Saving

The cost savings attributed to upgraded lines in this exercise assume that trains will always be operated at their maximum (= optimum) length or capacity. Objections will certainly be raised that these savings do not properly reflect the actual cost savings resulting from, for instance, ability to use fully loaded hopper cars, ability to use regular 'main line' locos, absence of restriction on speeds and so on. The following points should be noted in this respect.

1. This is a preliminary exercise based on documented cost estimates from the most reliable source to date. Further information may well be forthcoming which allow considerable refinement of these cost differentials.
2. According to the Snavely determined freight car costs (Appendix II, page 11-13) hopper cars are a more expensive way of moving grain than box cars unless hopper car turn-rounds can be reduced to at least half the box car turn round.

The appropriate calculations to determine the additional (future) cost savings associated with being able to run fully loaded rather than half loaded hopper cars on the rehabilitated lines have not been done here, but could improve the savings/capital investment comparisons made in this paper.

(xii)

3. The extent to which upgrading can significantly affect turn-round times on cars seems very limited. This factor depends primarily on the throughput through elevators and thus only the ability to service elevators is important, not the size and length of trains (or their speeds) with which this service is supplied.
4. The assumption of maximum train lengths in calculating the variable costs in fact works in favour of upgrading lines. These calculations assume that this maximum will in fact be run on upgraded lines whereas in practice the provision of regular service, scheduling etc. will probably mean that the full savings implied by maximum lengths of trains are not realizable.

SUPPLEMENTARY ESSAY

Regulation and the Characteristics
of the Supply of Transport to
Agriculture in Canada

by

Fred Anderson
University of Regina

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Résumé

Le transport des produits agricoles dans les provinces centrales du Canada, qui sont dotées de routes, de chemins de fer et de voies maritimes intérieures, ne présente pas les difficultés qu'ont connu les producteurs de céréales des provinces des Prairies au tournant du siècle, alors que les chemins de fer étaient le seul moyen de transport pratique pour accéder aux ports ou aux marchés du centre du pays. Depuis, les réseaux de routes subventionnées par l'État ont réduit la capacité des autres produits de "subventionner" le transport des céréales devenu non rentable en raison de l'imposition de taux réglementaires. Depuis 1960, les compagnies de chemin de fer ont bénéficié de l'essor de certaines marchandises en vrac (charbon, soufre, potasse) qui, de tout temps, se prêtent beaucoup mieux que les céréales au transport ferroviaire. Les céréales sont acheminées en plusieurs wagons identifiables vers de multiples destinations, tandis que les points d'origine des marchandises en vrac sont peu nombreux, et il en est de même de leurs points de destination.

Les réseaux routiers, subventionnés par l'État pour plusieurs raisons autres que le transport des céréales, constituent le système de transport et de collecte le plus efficace dans

n'importe quelle situation, les camions assurant le transport des points de collecte et les chemins de fer servant à franchir les longues distances vers le marché. Dans les conditions actuelles, les lignes d'embranchement ne redeviendront jamais rentables aux fins de collecte des céréales, bien que les politiques sociales des gouvernements, en concentrant la population dans des agglomérations plus grandes pour améliorer les services hospitaliers et scolaires, se trouvent à renforcer ce système de transport.

Comme solution, l'auteur préconise un système d'entrepasage qui servirait à amortir les fluctuations dans la production et la demande de céréales, plutôt qu'une expansion irréfléchie des chemins de fer pour répondre aux besoins dans les moments les plus achalandés; il faudrait ajouter une expansion judicieuse des installations, des taux suffisamment élevés, ainsi qu'une bonne dose de coopération en vue de l'adaptation des diverses institutions qui se font concurrence dans le commerce des céréales. En elle-même, la réglementation des transports est impuissante à garantir à l'agriculture des taux ou des niveaux de service donnés, même au secteur produisant les céréales d'exportation, qui est encore dépendant d'un moyen de transport unique. La réglementation a ses mérites, qu'il s'agisse de régir les rivalités entre les entreprises ou de définir les limites de la concurrence, mais elle ne peut modifier les problèmes économiques fondamentaux des transports que doivent affronter les producteurs de céréales de l'Ouest canadien.

Summary

Transport for agricultural products in Central Canada, because of road, rail and inland waterways, do not present the problem that faced prairie grain farmers at the turn of the century where rail was the only practical means of transport to export ports or central Canadian markets. Publicly supported road networks have since reduced the ability of other products to "cross-subsidise" the less profitable grain traffic where statutory rates now make grain transport uneconomic. Rail transport since 1960 has benefitted by the growth of true bulk commodities (coal, sulphur, potash) which are more suited to rail operation than grain ever was or can be. Grain moves in many identifiable car-loads to many destinations whereas true bulk commodities originate at few points of origin for few destinations.

Road networks, publicly supported for many reasons other than grain transport, are the most efficient transport and collection system under almost any conditions with truck transport to collection points and rail for moving long distances to market. Branch lines for grain collection systems under these conditions will never again be economic and government social policies which have been concentrating towns into larger units for improved hospital and schooling services reinforces these transportation patterns.

A storage system, which buffers cyclical grain production and marketing peaks, rather than unthinking expansion of railways to meet peaks of traffic, coupled with a judicious expansion of physical plant, properly ~~remunerative~~ rate relationships, and much co-operative adjustment within and between competing institutions in the grain trade are needed to solve present problems. Transport regulation in and of itself is unable to guarantee either service levels or rates to agriculture, even in that sector of agriculture, export grain, still dependent upon a single mode of transport. Regulation, such as control of inter-firm rivalry and defining the limits of competition has merit but it cannot change the basic economic characteristics of transport facing grain producers in Western Canada.

Regulation and the Characteristics of the Supply of Transport to Agriculture in Canada

Fred Anderson
University of Regina

1. Introduction

The supply of transport service directly to agricultural producers is provided by two modes, road and rail, and by three types of contract arrangements, common carrier, contract carriage, and transport by owner of the goods. Rail offers both common and contract service; the road mode provides for all three. This variety of options gives transport service to agriculture on terms and conditions similar to that which is available to all other productive activities in the country. With but one significant exception, the common carrier movement of western grain to export positions by rail, there is no problem of transport in Canada which is unique to agriculture.

Insofar as the movement of agricultural produce makes use of inland waterways, there is an emerging ship supply problem. That issue, too, is associated with the movement of prairie grains. It is an issue in which agricultural producers are less directly involved - not being called upon directly to pay for the inland ship movement of product. The problem lies, apart from its mention, beyond the scope of this analysis.

Therefore, exceptions noted, the agricultural supply of transport, where there are practical options, is the same as the supply of transport to all other productive activity. For a large part of Canadian agriculture almost every other component of production cost is of greater moment to agricultural output and income than the supply of transport. Only sporadically, as in all other industry, does a failure of transport service, or rates, affect farm sales.

It is not the particular characteristics of agricultural production which create the options for the movement of its produce. It is, rather, the linking of three separate things which come together to produce an effective road haul system in competition to rail. First it is the massive public investment in a modern road and highway network which is the basic ingredient. Twenty years have seen over most of the agricultural regions of Canada the creation of all-weather roads running from every farm gate to any designated destination in North America. This is a truly phenomenal event, an investment of gargantuan size far exceeding any transport undertaking which ever preceded it. It dwarfs the drama of railway building by its sheer size and extent, even if it does not match the railway in romance and nostalgia. The whole process occurred in the public sector, effected by monies raised from taxes, and made totally available to anyone who can put a vehicle on it.

The second event was the response of the automotive industry in developing a small but adequate range of vehicle types to run over the roads. Vehicle types provide effective economies of operation from small pickup and delivery services to large and specialized line-haul trucks and trailers.

The third event was the ad hoc, sometimes erratic, but generally permissive licensing of vehicles by the state, and the cooperative arrangements for reciprocal running rights and common standards which extend the range of any vehicle beyond the confines of one city, township, county, province or nation.

These three coincidental, but interdependent events gave both industry and agriculture competitive transport options not possible with only one common carrier mode such as the railway. The ancient right of way over the Queen's high road offers to any person the option to carry his own goods, an option not freely available on a railway. The effects of this option had a profound impact on the nature of transport services offered.

First, the for-hire road haulers seized the opportunities to specialize in certain limited types of traffic by agreeing to haul on contract. Specialization brought efficiency, and that, under the spur of competition, permitted faster service and lower rates than was possible by the generalized common carrier who, under his franchise, is confined to one route and compelled to take all goods offered in both small and large consignments.

The impact of contract carriage competition went beyond the road mode. Railways changed their rating structures in a variety of ways in pursuit of traffic. They began to offer contract services, and in addition changed their general service approach and began investing heavily in specialized equipment to tailor service to new rate options. Indeed, a great volume of rail business is now confined to specialized contract service for commodities and distances at rates below that which can be offered by any competition. What began as a gesture to capture and retrain traffic from the trucks became a whole new side of railway transport as Canada's bulk commodities grew in response to world demand. Coal, sulfur, grain, much lumber, potash and other minerals now move largely by rail at rates determined by contract bargaining, well below the reach of competition.

Railways, however, continue to have the obligations of common carriage, that is, the obligation imposed by law to carry all traffic offered to and from every point on the rail network. Many truck lines also operate under the security and risk of common carriage with more limited networks of routes. The emergence of both private and contract carriage competition has had effects upon the performance of road and rail common carriers with repercussions on productive activity, particularly small scale activity which characterizes agriculture.

The Analysis of Common Carrier Economics

All goods to be moved have different characteristics which affect the cost of moving them. Some goods are costly to haul per unit, and some less so, depending upon the combination of cost components in each shipment. The cost components are made up of distance, size of consignment, weight to volume ratio, perishability, fragility, and such.

It is also true, apart from costs, that different goods have different intensities of demand for movement, sometimes called the "ability to pay". This means, first, that there are some goods which will move as needed at even high rates either because the rate is such a small part of the final selling price that it is of no importance, or that the urgency to move it is great enough that the shipper will pay a high rate. There are also goods which cannot bear high charges if they are to move, because they have a low selling price in the market which would soon be absorbed by high transport charges. Each of these shippers faces a range of charges which increase with distance. Each shipper, given the options available, seeks to achieve lower charges by cheaper modes, or by appealing for lower rates.

The traditional intention of regulation of common carriers has been to equalize transport service between shippers at rates which give the carrier a return deemed adequate by the authorized regulator. The purpose was carried out by setting a

schedule of rates graduated by "ability to pay" and by distance, which enabled the whole mix of goods to move, goods of both high and low cost of movement and high and low ability to pay. However, traditional common carrier schedules were based primarily on "ability to pay", not on the cost of movement. Hence any good in the schedule, - either rated high or low by its ability to pay - might yield a large or small surplus over its actual cost of movement depending whether it was a costly good to move. Some goods, either high or low rated, might not yield any surplus. But so long as the mix yielded an acceptable return to the carrier, "equity" was satisfied; always excepting, of course the individual rate which was appealed as being, in the eyes of the shipper, misplaced in the schedule and therefore "inequitable". Thus the notion of "cross-subsidization" from more profitable traffic to less profitable, was created to explain the justice of the rate system. The phrase, long used in practice, is actually a misnomer, since surplus revenue above the costs of one movement does not go to the less profitable traffic at all: it goes to the carrier. But use of the phrase in this analysis is not seriously misleading. Under the notion of "cross-subsidy", as long as average earnings are satisfactory, the high profit goods are said to "subsidize" the low, and all goods move under the schedule of regulated rates.

It becomes obvious, then, how common carrier total revenues erode when selective competition from contract or private carriers arises. The most profitable traffic is bid away. Private and

contract carriers do not have to carry those goods where the margin between the nuisance and the reward for work done is unattractive. They have no need to "cross-subsidize". The common carrier, when he attempts to cut rates in response to selective competition, finds his revenues diminished, but his costs, so long as he must offer a total service, do not reduce proportionately to the loss of revenue.

The common carrier response, whether a road or a rail carrier, is to begin to drop the higher cost segments of his business, which taken by themselves, would never have been very rewarding. It is no surprise that railway small package service and branch line service are first curtailed after competition of private carriage and contract carriage strikes. The truck common carrier, similarly, seeks to drop lower volume routes, avoid higher cost consignments, and eliminate low volume smaller towns from his obligations.

It is useful to recapitulate here that the loss of branch line service and discontinuance of common carrier road service to hundreds of smaller centres have come from the benefits bestowed by competition arising out of freedom of access to roads, and freedom of contract permitted by the regulators. It was the emergence of competition which curtailed universal common carrier service and forced agriculture to provide more transport services for itself. There is every indication that the benefits and freedom have had positive net results, but undoubtedly there has been hardship in the loss and rearrangement of service patterns.

The trend to be derived from this analysis is easily discernible and its outcome predictable. Common carrier services by rail and road will continue to shrink. It is a price to be paid by small communities for the benefits which the options of private and contract carriage carry with them. Short of subsidy, there is no way to preserve previous patterns of service.

The conclusion to this analysis is also clearly apparent. Effective regulation of rates and service is possible only as long as the regulated firms carry all the traffic. Once any private and contract options are possible the erosion of revenues begins with the loss of most of the profitable traffic. Regulated carriers, being profit dependent, will attempt to join the competition. They begin to quote contract rates and begin to escape their most costly common carrier obligations. All attempts to regulate rates and service on the remaining traffic become an exercise in futility in trying to preserve both "equity" and carrier revenues. Regulation may very well succeed in some other objectives, such as control of inter-firm rivalry, and defining the limits of competition. But unless subsidy is involved, the regulatory function loses its power to control all but residual rates. More often than not the regulators are forced to become the preservers of the common carriers, not the defenders of the shippers.

There is a further conclusion to be made explicit here, bearing on the subsequent section of this analysis in which rail and grain issues are considered. The conclusion is that rail rates

frozen by statute are not the cause of erosion of rail common carrier services to general traffic nor are they the cause of diminished branch line service. Careful review of the logic of the analysis in this section supports this conclusion. No carrier, forced by competition to give up remunerative traffic will (or can be forced to) continue the high cost segments of his network services. Escape from control is not a question of obligation, or of equity or justice. It is a matter of revenue loss, and erosion of ability to "cross-subsidize" traffic.

In support of this conclusion one need only compare the state of branch line service and general freight in areas not affected by statutory rates. In no part of North America has the railway branch line network and general small shipment service survived competition intact.

The concomitant conclusion must also be made explicit. Adequate system remuneration paid to railways for carrying prairie grains to export positions (however "adequate" may be defined and decided) will neither restore the whole network of branch lines nor improve general freight service. Higher grain rates adequate to make these reversals profitable would have to be too high to be acceptable. Even branch line rates based strictly on the cost of service on the branch would be too high to get traffic to move over it. Producers would by-pass the costly rail segment and use trucks to move product to lower rated points.

Rail Transport for Agriculture

The category of agricultural produce still most rail dependent is grain, particularly grain moving long distances to market. Statutory rates apart, grains have enough of the cost characteristics of bulk loading products to give the railway a competitive edge over trucks under proper conditions. There is no impending breakthrough in the technology of roads and trucks likely to threaten this edge.

Bulk loading advantage, it should be noted, applies only where the true economies of rail transport can be brought to bear. Trucks have the advantage in all aspects of costs of transport (regardless even of fuel price if both modes pay equivalently) until enough parcels of grain can be gathered to fill sufficient rail cars to give full play to rail's advantage. In high yield areas the optimum volume will be gathered by short truck hauls. In lower yield areas the economic distance of haul may be long. It is not really a matter of distance at all. It is a matter of gathering by truck enough grain at one place to warrant bringing in a train.

Estimates will vary on the size of that volume. It will depend on a range of costs, such as the state of the track and the elevator capacity. Optimally a collection point which can load a minimum of twenty to thirty rail cars in the time interval between car dropoff and pickup will divide the operating advantages of both truck and rail economically between them. If three such

lots can be assembled in one train run, for delivery to one or two destinations, there is no cost advantage which trucks possess that can displace train service under these conditions.

Alternatively, until volumes of this order can be assembled, trains lose out to trucks on the basis of cost, given the fact that roads are publicly provided and will be maintained regardless.

Even in the matter of fuel consumption, there are greater gains in converting to larger trucks to pull grain to the rail optimal loading point than in extending train service closer to producers. The future fuel allocation scheme which ignores incentives to use larger trucks fully loaded will distort resource use.

Export Grain as a Bulk Commodity

The rail mode achieves its greatest efficiency when it collects multiple car blocks of traffic from few points of origin for delivery to few destinations. This is sometimes referred to as "hook and haul" service. It eliminates both the physical and paperwork costs and delays of single car spotting, pickup, marshalling into trains, and breaking out cars for individual destinations. The characteristics needed for bulk service also include short turn-around time at both origin and destination to maximize equipment utilization, plus of course, adequate power and main line capacity to keep the trains moving. It further helps costs of

maintenance and operation if the traffic uses as few types of engines and cars as possible.

A few agricultural commodities can, by special arrangement, be made to fit these requirements. Normally none do. And yet prairie grains have been characterized as bulk commodities for decades. It is an approximation, a term applied to grain in the historical period when there was no true bulk commodity movement of any significance.

The efficiency of the railway gave it power to extend the length of haul far beyond the limits of any contemporary mode. The railway became the mode which utilized its efficiency to reach the scatter of agricultural shippers in a quite amazing network of lines. At the time, it appeared that the overall efficiency of the system would permit high-cost, light-density branch lines to come within a few miles of every farm gate, at least in Western Canada where the high cost of branch line service was a smaller part of the longer total haul than in Eastern and Central Canada.

When railways were built, Western agriculture was the very engine of growth in Canada. Unlike Eastern and Central Canada, in Western Canada, on the prairies specifically, all rail lines were agricultural lines, intended for the hauling of outbound wheat and other grains to a very few terminal points; an immensely efficient haul pattern compared to any other mode. It enabled, for that time, great economies of large scale to operate.

In the westward direction railways were the only practical means of shipping to the farm towns the variety of goods needed to sustain output. These goods originated largely in Central Canada from a reasonably compact industrial area. They went west in large volume, thinning out through smaller and smaller "break-bulk" warehousing steps until they reached the small farm communities where the rail movement ended. This outgoing movement was more costly than the "gathering" movement of farm products, but the goods paid higher rates.

All taken together, the system had captive a good mix of traffic with both high and low ability to pay, and a mix of both high and low cost movements. With rail service tied for the most part to the universal thirty-ton boxcar, specialized transport service was minimal. For decades prairie grain moved east, then east and west, over the main lines in impressive trains of general service boxcars. But these trains were assembled car by car, each a special type and grade of grain gathered over the wide network of prairie branch lines. In those times it was the "bulkiest" of the long haul traffic, destined essentially to two or three points. Impressive as the annual grain movement was, compared to modern bulk traffic it hardly qualifies: it was, more properly, a large annual volume of carload traffic - each carload a distinct shipment in every way. It still is, today.

Rail transport since 1960 has benefited by the growth of new traffic much more suited to the characteristics of rail operation than grain ever was or can be. True bulk commodities such as coal, sulfur, potash, and other minerals and concentrates have utilized "solid block" or "whole train" concepts and grown in volume to the point of absorbing most of the main line excess capacity, always assumed to be a characteristic of railways. Unlike grain, these commodities do not move in separately identifiable carloads, they require no network of branch lines with all the investment needed to gather and store product in thousands of tiny bins. These true bulk commodities move from few origin to few destination points in a simple and tidy fashion. Railways have no traditional common carrier obligations to these commodities. They move on rates set by bargained contract, not by regulated rates. Their rolling stock is new, uniform and committed, economizing on time and energy. They have brought the rail mode into its optimum milieu. They have broken the last link of dependency which the rail system had upon grain. Their transport logistics have set models which grain cannot match.

These bulk commodities have not only displaced grain as more desirable commodities to move, they are competitive with grain for main line space, motive power, manpower, and some equipment. They also move in smoother more predictable patterns, unencumbered by the plethora of government, corporate and union jurisdictions which afflict grain. They are, in short, less costly and, at present, more remunerative. Both features make them preferred traffic to export grain.

Emergent Problems in Export Grain Transport

The characteristics of grain are less suited to the logistics of rail transport than other large volume export commodities. Given the wide dispersion of the gathering system, the necessary grain and grade distinctions which must be maintained, and the chronic congestion at destination, it is obvious that export grain is at a disadvantage. These are difficulties of transport inherent in the marketing of grain and they will increasingly work to agriculture's harm as export markets for grains and other commodities increase, putting more and more pressure on rail capacity.

Dismay at lost export sales has increased alarm and agitation over the inability of the marketing system, including transport, to meet the future. Should projections of grain demand for 1985 be even close, it is obvious to all but the most optimistic that the marketing system is not going to meet the demands placed upon it: the transport sector of the whole marketing network will not, and cannot, unless certain quite clear processes speed up.

While it is demonstrably true that the rail system can now, in annual capacity terms, accommodate present total tonnages, and railway sources have publicly documented their confidence that the rail sector can handle prospective tonnages of all bulk commodities, nevertheless the loss of export grain sales through incapacity has been affirmed. Wherein lies the explanation for the dilemma? Is the transport sector at fault? If it is, this default will seriously deter the forecast increase in grain production.

The apparent contradiction of adequate annual capacity and lost sales arises from joint causes. One is the growth of total traffic. The other is the uneven flow of traffic in response to the independent demands made upon the system by different export products. Traffic moves in response to the world demand pattern for Canadian raw material exports. Those peaks of demand, which are reflected instantly in the demand for transport, cannot be changed very much by actions of Canadian producers.

The cyclical nature of grain production and export is determined largely by climate. During the period when no other large volume product competed with grain for rail movement, the brunt of seasonal peaking was absorbed by widely spread farm storage, thousands of scattered small country elevators, the internal and waterside terminal elevators and the large fleet of box cars. The storage system buffered production peaks from marketing peaks. The entire commercial and regulatory and marketing system was built on the fact of surplus total transport capacity. At the peaks grain had no competition for railway service other than itself.

Growth of grain sales and emergence of other high volume export products have brought into focus the real cost of a grain marketing system composed of several parts which, as long as transport remained in fairly plentiful supply, had no great need to coordinate activities. Then, the Canadian Wheat Board had no need to consider the effect on transport of its governing principle of equity between producers. Then, the equity principle need provide

no incentive for timely delivery. Then, the grading system had no responsibility for the effect of its work on transport. Then, railways could sell their services without concern for their ability to move grain, without casting even a backward look at system delivery capabilities. Until transport capacity became a scarce good, each segment from producer to final sales agent could optimize his own operation, concerned only with his own best interest.

Can export grain be fitted adequately into a transport system which is on its way to being overcrowded? While it may be demonstrated that average annual system capacity is more than adequate for annual tonnages, more and more the coincident peak demands of all export products will create capacity shortage. Inevitably, more and more, export grain, with its difficult physical characteristics and its numerous involved public and private interests, will suffer loss of timely movement, loss of sales, and consequent restraints to increased production.

Caution is advised in seeking a solution. Because the characteristics of the export grain traffic are less suited to the economics of rail haul than other bulk loading export traffic competing for main line space, it must not be presumed that remunerative rail rate levels will give export grain priority of place over other traffic, or even parity of place. Higher rates is a simplistic remedy, a mere nostrum which, while necessary, is not sufficient. Much more than rate reparation is required to fit grain traffic competitively into a crowded system.

Likewise outright physical expansion of railways to meet every peak of traffic is an impossible, an unwise goal. The cost would be prohibitive even if it was a practical possibility. Never again can the nation and its railways build in excess capacity to accommodate every possible demand. The solution will lie in judicious expansion of physical plant, properly remunerative rate relationships, and much cooperative adjustment within and between competing movements.

There is small scope for the true bulk commodities to improve their transport performance. Greater scope for improvement lies within the grain export industry to regulate itself and order its affairs to become more closely akin to a true bulk product. Changes in the institutions which grade, handle and sell grain to induce greater incentives will have profound effect on grain's competitive ability. Changes to physical plant which handles and stores grain are almost equally important.

The Agricultural Resolution of the Rail Capacity Problem

Recognizing the many many rigidities, conflicting objectives and limited powers possessed by both private and public segments of the grain marketing process, it still remains that the insights needed within agriculture to facilitate better use of transport are few. It is obvious that overcoming periodic transport bottlenecks for grain through the rail system in the face of anticipated greater and greater volumes means better synchronization

between all the export commodities. On the supply side of transport, good information is needed about the true capability of the system to move various bulk goods, knowing the direction of movement, the various peaks, and problems associated with weather slowdowns. Such information needs to be widely-held.

On the demand side, the first requirement is to make all commodities comparable revenue earners for the railway, knowing the different costs associated with the various commodity movements. This is an old requirement, first publicly recognized in 1962 in the Report of the Royal Commission on Transportation. It is today even more obvious. But the means to achieve this obvious and equitable end cannot be agreed upon: indeed, advocates of higher returns to railways for moving export grain often inhibit solution of the problem by claiming too much for it. A higher rate alone will not solve agriculture's problem with transport.

Beyond the revenue question are matters within the purview of the system users, including export grain. It is again obvious that peaking can only be diminished in export grain by adequate storage sufficient to overcome transport bottlenecks whether they are caused by competing demands, capacity slowdown due to winter conditions, or unusually erratic sales. If the industry is going to sink capital into efforts to overcome marketing limitations, that investment will have greater effect in storage "on the shelf" at tidewater than in extra rolling stock which cannot roll over congested lines.

In conjunction with tidewater storage, support must be given to additional storage programs on farms if higher total production projections are to be met. More than price, more than sales, it is empty bins which encourage output. Given the ineradicable single short harvest season, given limited storage at tidewater, given congestion caused by grain and grade differences, cleaning requirements, competing commodities, climatic shutdown on the prairies, and sales inevitably out of phase with harvest, assisted farm storage is an obviously intelligent use of funds to encourage production. But more than that, good farm storage with accurate inventory accounting, coupled with delivery incentive, will do much indeed to get movement to tidewater on the off-peak, when rail capacity is available.

Finally, rail and elevator rationalization needs encouragement. Given the cheaper cost alternative of the road network for low volume movement, it is folly to persist in using the traditional inefficient scatter of branch lines to collect small parcels of grain. Associated with system rationalization is country elevator closures. In fact, it is the profit maximizing finesse of the grain companies which began unburdening the industry of an outmoded branch-line system. The earliest successful abandonment of branch lines followed the closure of elevator points on them.

Hand in hand with the elimination of light-density branch-lines goes serious upgrading of a core rail system. Here, to the moment, the railways and grain elevator companies have shown no

evidence of voluntary cooperation. Each fearful of its own public reputation, and sensitive to public outcry led by populist leaders, the true and efficient rationalizing process which is well within the wit and purse of the whole industry, is postponed tirelessly to a cacophony of public outcry and misunderstanding. The agricultural sector will be the loser in the very short term if production rises to meet expected demand and transport efficiency is stalled in foolish hesitation over inevitable rationalization.

Sober reflection on the constraints of both production and marketing which will keep grain production from reaching the full forecasted 50% increase by 1985, makes it obvious that the pressure on rail transport will be less than the full increase would create. But the pressure of competition for rail space will intensify as other true bulk commodities see export markets grow, and as they expand to meet them. So, even without rapid growth of grain production, grain movement will constantly be under pressure. Without internal change to become more efficient in transport, grain will lose place in the queueing which is inevitably to come.

Summary and Conclusion

This analysis has shown that, when competition emerges in transport, it is no longer possible to regulate rates and service effectively to preserve carriers' revenues or equity between shippers.

Therefore, history apart, regulation is now unable to guarantee both service levels and rates to agriculture, even in that sector of agriculture, export grain, still dependent upon a single mode of transport. No amount of emphatic insistence on more regulation can turn back the clock.

Furthermore, it has been demonstrated that export grain is disadvantaged in securing an adequate share of available rail transport because grain has less favorable transport characteristics than true bulk commodities. Inevitably, as transport capacity becomes more limited, export grain will lose priority of place.

The same analysis brought out the conclusion that, while adequate railway revenue is certainly needed in payment for work done, it is a false hope that higher rail rates will substantially improve grain's priority for transport. It was argued that, in addition to this, new, more flexible marketing incentives and discrete capital expenditure on farm and terminal storage, and particularly the latter, is the first order of priority for new capital spending in grains marketing. Concomitantly, savings through rail and elevator rationalization will improve the transport characteristics of grain and assist it, in true cooperation with other export commodities, to share equitably in the use of rail transport service.

The success of all these measures depends upon agricultural industry initiative, not regulation of transport, for improvement in the future. The use of regulatory power to force other commodities

aside to make place for grains is possible, but it is doubtful if the necessary political pressure can be successfully applied by grain growers. To date regulatory power has been either unwilling, or unable to force grain through the system. Regulation of this sort has nothing to commend it as a permanent solution.

The time remaining is shortening. To the moment no initiatives in any of the indicated directions are forthcoming. It moves one to wonder what leaders in the industry think will happen. Invoking the time-honoured tradition of using the railways for a scapegoat only obscures real cognition of the issues. Even the recent creation of a Grains Movement Coordinator seems but indirectly and hesitantly to address the real issues of internal industry efficiency and rationalization, and commodity cooperation.

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