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Comparing International Market Performance: Conceptual and Measurement Issues

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Grain - Marketing

It has become fashionable to compare the performance of alternative marketing systems: particularly the grain marketing systems of Canada and the U.S. (cf. McCalla and Schmitz; Peltier and Anderson; Food West Resource Consultants; Dever). This is not surprising given that there have been proposals to give a centralized agency (e.g. the Commodity Credit Corporation or an entity like the Canadian or Australian Wheat Boards) some degree of responsibility for marketing U.S. grain. Conversely there are numerous proposals in Canada to reduce the marketing responsibility of the Canadian Wheat Board and to alter other elements of the grain marketing system.[1]

With such pressures it is appropriate and necessary that performance comparisons be made. But to do so requires that two questions be answered: how does one conceptualize performance and how does one measure it? The objectives of this paper are: a) to present a process for arriving at a conceptual framework for comparing performance; b) to suggest a conceptual framework in the form of performance objectives for comparing grain market performance; and c) to suggest a series of measurable performance indicators.

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Developing a Conceptual Framework

It is tempting to define performance as either the level of prices received by producers (as has most of the empirical work cited above), or to attempt to define it in terms of industrial organization theory. Both are necessary: neither is sufficient.

Grain marketing systems are complex: but there is a tendency to simplify their structural aspects. For example, the Canadian system is often regarded as Board-controlled while the U.S. is regarded as an open market system. However, the private trade and a futures market play the majority role in marketing domestic feedgrains and oilseeds in Canada, and the private trade operates in the international market as agents of the C.W.B. The Commodity Credit Corporation has an increasingly important role in the U.S. system. In both countries, the public sectors are important actors in grain marketing through pricing, food aid and transportation policy as well as grading, provision of market intelligence and research. Obviously, the nature of public policies in each country is substantially different. But just as obviously, both systems contain private, quasi-public and public institutions. The differences are of degree and specific function.

The mixed nature of both countries' grain marketing systems, as well as those of other countries, makes it mandatory that the structure of the system be defined and thoroughly understood in undertaking comparative analyses of performance. Furthermore, given the increasing role of the public sector and the multi-objective nature of public policy, the definition of performance cannot be restricted to a conceptual framework which includes only variables internal to the grain sector. Public

policy is developed by and has its impacts through a series of economic and social tradeoffs. For the grain sector, these tradeoffs occur not only among entities which produce and handle grain and among the various species of grain and oilseeds, but also among closely related sectors such as the domestic livestock complex, and upon matters of national concern such as international balance of payments or domestic employment.

Hence, it is not sufficient to ask which system returns the highest prices to producers. It is possible that a system is willing to sacrifice on producer prices in order to gain elsewhere. Similarly, it is not sufficient to ask which system provides the least productive or pricing inefficiency, or to relate concentration ratios to profitability as is the wont of industrial organization theory. The latter question is irrelevant to quasi-public institutions such as the C.W.B. or the C.C.C. It is both necessary and sufficient to form a concept of the sector's (or subsector's) objectives from the public point of view as well as from the view of private market participants.[2]

To formulate this concept, a process suggested by Shaffer and Jesse is adopted. To pre-summarize, the process consists of the following steps. First, the market participants with an interest in the sector under consideration are defined. Second, the expectations each group of participants have from the market are specified as generalized objectives. These are expressed in terms which are value laden, not prone to measurement and, in some cases, embody multiple concepts. To add specificity, the third step is then to define a set of performance indicators which represent the various objectives. The principal contributions of these indicators are to delineate the various concepts embodied in the

objectives and to assist in moving closer to measureable variables. The final step is to specify a set of quantifiable measures which represent each of the performance indicators and provide the basis for analysis.

Below is an application of this process for comparing performance in the grain marketing sector.

The Participants

Participants with interests in the grain marketing system include the following: (1) consumers of three distinct types - domestic consumers of food grains, foreign consumers of food and feedgrains, and domestic consumers of feedgrains; (2) domestic grain producers; (3) domestic intermediaries - i.e. grain handling firms and quasi-public agencies; (4) the public sector is concerned with the grain sector's contributions to opportunities for growth in investment, employment and foreign exchange earnings.

While the list of participants is relatively straight forward, the objectives of each are not necessarily easy to separate: in some cases they overlap, in others they conflict as one would expect in an interdepent system.

Objectives, Indicators and Quantifiable Measures

The first four objectives (Table I) are internal to the grain sector and include concepts similar to those included in industrial organization. In objective I, domestic consumers of food grains are treated separately from consumers of feed grains and foreign consumers (see below). The indicators delineate the two components of the objective

and the quantifiable measures are straight forward.

Objective II contains several concepts. The first, emanating from the desire to stimulate production, relates to the level, stability and adequacy of producer returns. The second, price spreads and marketing costs, is concerned with the operational and pricing efficiency of the marketing system.

Because objective II includes the reflection of consumer preferences, the third indicator is market signals. The first three measures concern product grades. The relevant questions are: are there sufficient (or too many) and sufficiently understood grades to reflect qualitative factors; is the integrity of grades maintained throughout the marketing process so that those attempting to respond to qualitative factors are rewarded for so doing; do grades reflect buyer preferences?

A third measure associated with market signals is the correlation between world and domestic prices. This variable should indicate how well the domestic market reflects world demand so output and consumption can respond.

A fourth concept is the response to change in the preferences of consumers. For grain exporting countries, the major potential changes in preference lie in: wheat relative to coarse grains; grains relative to oil seeds; milling relative to feeding quality wheat; and traditional relative to new crops. Changes in preferences should be apparent in trends in international demand (i.e. trends in trade) for the relevant products. Where structural change is apparent, the measures of response are trends in production or acreage of the relevant products, and production or acreage response to world prices.

Productivity (objective III) is in many ways the mirror image of the cost considerations in II B. However, productivity ratios can often be measured more easily than costs, and focusing on an explicit productivity variable assists in separating changes in costs due to changes in productivity from those due to other factors. Each measure only partially represents the underlying concern. An alternative, but difficult to obtain, measure of productivity and efficiency that should likely be considered is a frontier efficiency measure as suggested by Farrell.

An area of central concern regarding the evolution in grain marketing institutions is equity: in fact one of the stated objectives of the Canadian Wheat Board is to ensure equitable market access to producers. Equity considerations also, of course, revolve around income distribution. Hence, the indicators and quantifiable measures for objective IV are divided into categories reflecting market access and income distribution.

A major issue in the debate over board vs. non-board marketing systems is their ability to penetrate and maintain export markets in various countries. In particular, there is concern that, in a world wherein purchases are made increasingly by state or quasi-state trading corporations, a decentralized non-board marketing system has disadvantages (Schruben). The corollary is that a centralized selling system with greater control over output, prices and transportation has greater ability to negotiate long term contracts - particularly with the centrally planned economies. Hence, accessing alternative foreign markets is an objective (objective V) and the measures are intended to

reflect performance thereon.

A related issue is the ability of the exporting system to respond to short term market opportunities (objective VI). Can a system anticipate market opportunities and deliver product when opportunities arise? To measure this, the exporter's share of world trade, when world trade or world price differs from trend is suggested.

Objectives VII-IX relate to the interface between the grain and livestock sectors, as well as the contributions of the grain sector to the balance payments, employment and investment. The two general concepts in these three objectives are intertwined. The grain sector provides an input for livestock production; but it also competes with the livestock sector for resources. If the grain sector is organized such that the domestic feed market is discriminated against in favour of the export market, then resources will be misallocated and the domestic economy may forego value added, employment, multiplier and foreign exchange benefits of increasing livestock production. Devine has indicated that, for Canada, the value added and multiplier effects of livestock production and processing are greater than for grain production and handling. Hence, it is necessary to consider foreign exchange earnings, investment and employment in both the grain and livestock sectors. The final three objectives, their indicators and measures attempt to do so.

Some Concluding Considerations

There are a number of issues related to operationalizing and interpreting the results of analysis using the conceptual framework presented here. One is the measureability of the quantitative measures

and the degree to which each measure represents the underlying indicators and objectives. Clearly measureability is variable. Some are relatively easy to obtain from secondary sources. Some, even if available from secondary sources, are difficult to express on a comparable basis. For example, a study under way at the University of Illinois (Lonergan) is attempting to compare export (West Coast and Great Lake) and farm prices for wheat in Canada and the U.S., and price spreads relative to handling and transfer costs. Some of the difficulties encountered in making price comparisons are: export prices reported at different positions in the marketing system; doubts about the representativeness of reported prices; variations in grade definitions, protein content, moisture content, and dockage specifications in the two countries; and the requirement that farm prices be calculated at points comparable distance from the ports.

In many cases secondary data are not available, and substantial conceptual and empirical problems would be incurred in obtaining primary data. For this reason, alternative quantifiable measures have been suggested for some objectives: although in many cases what is measureable is likely not as good a representation of the objective as what is not. For example, a frontier measure of efficiency and productivity as suggested in the text is a better measure than the comparison of costs and simple productivity ratios suggested in Table I.

A second, and related, issue is that of assigning causality where differences in performance occur. This is illustrated by two studies (Martin (1980), Wilson and Anderson) which have attempted to compare performance of the Canadian and U.S. systems on objectives V and VI.

Both studies showed that the U.S. system was superior on both objectives. However, there are several hypotheses regarding the operational and pricing attributes of the two systems which could have caused the differences in performance and some, in Western Canada, contend that Western Canadian climate limits production response and thus the ability of the Canadian system to gain and hold international markets as well as its ability to respond to market opportunities. Further analysis is required to sort out the causes.

A third issue is that many of the measures do not provide norms: they are merely descriptive. In no case, for example, where variability of a series is suggested as a performance measure, is it suggested that a given degree of variability is good or acceptable.

In response to the latter two issues and in defence of the framework suggested, the objective of the exercise is to provide a framework which is diagnostic, as Bressler and King have called for. Analysis of comparative economic performance is done to provide policy makers information on the strengths and weaknesses of alternative systems and to determine areas in which performance of a given system can be improved. For many of the objectives of a grain marketing system, norms cannot be determined analytically. However, comparison across systems using this framework can provide information on relative performance in various areas. It can also point out in which areas performance diverges the most, so that efforts can be productively focussed on determining the causes, possible cures and the impacts of alternative cures on other performance measures. In a world wherein business and public policy are made in response to conflicting objectives, perhaps this is the best we can hope for.

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Footnotes

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[1] Some of the most recent include: 1) moving responsibility for feed-grain exports to private traders; 2) reducing Wheat Board control of rolling stock; 3) removing the Wheat Board's power to establish delivery quotas for non-board grains and oilseed; 4) substantially altering the administration of benefits under the Crow's Nest Pass Agreement for freight rates.

[2] Bruce Marion made this point clear in commenting on a related paper (Martin, 1979).

Table I

Performance Objectives, Indicators and Quantifiable Measures

Objective / Indicator	Quantifiable Measure
I. To assure an abundant supply of food grains to domestic consumers at economical prices.	
A. Level and stability of available supplies	1. Trend in available supplies 2. Variation around trend in available supply
B. Level and stability of consumer prices	1. Trend in consumer prices 2. Variation around trend in consumer prices 3. Consumer prices relative to CPI, WPI or substitute prices
II. To stimulate and facilitate the efficient production and distribution of that combination of products and related services which best reflect the preferences of consumers and the real relative cost of production.	
A. Level and stability of producer prices	1. Trend in producer prices 2. Variation around trend in producer prices 3. Producer prices relative to costs
B. Price spreads and marketing costs	1. Price spreads - spatial and at alternative market levels 2. Transport, handling charges and costs 3. Spreads relative to costs
C. Market signals	1. Number and type of product forms and grades 2. Grade aggregation at final sale level 3. Buyer preferences compared to existing grades 4. Correlation between world and domestic prices
D. Adaptability to structural change in demand	1. Production or acreage of new or differentiated crops 2. Output or acreage response to changes in world price
III. To increase productivity	
A. Productivity	1. Trend in output or value added per unit of labour/capital 2. Output relative to industry capacity 3. Turnover or turn around ratios for various factors 4. Rate of technology adoption
IV. To distribute opportunities and rewards equitably.	
A. Income distribution	1. Grower returns and marketing margins relative to production and marketing costs 2. Income distribution among owners of factor inputs
B. Market access for producers	1. Price variations among producers 2. Sales restrictions 3. Carry-over as a proportion of production
V. To gain access to international markets.	
A. Sales to alternative countries/region	1. Trend in exports by destination 2. Trend in market share by destination 3. Trend in exports by destination relative to (exporter's) domestic production
VI. To respond rapidly to short-term market opportunities.	
A. Response to change in demand	1. Share of world trade when trade exceeds trend. 2. Share of world trade when world price exceeds trend
VII. To encourage stable growth in livestock production.	
A. Feed grain prices and availability of supplies to livestock producers	1. Trend in prices 2. Variation around trend in prices 3. Variation in on-farm inventories of feed grains
B. Livestock production	1. Trend in livestock production 2. Variation in trend around livestock production
VIII. To encourage foreign exchange earnings in the grain and livestock sectors	
A. Foreign exchange earnings	1. Trend in foreign exchange earnings for grains 2. Trend in foreign exchange earnings for livestock products
IX. To provide growing and stable investment and employment opportunities in the system	
A. Employment in grain handling and livestock processing	1. Trend in employment 2. Variation around trend in employment
B. Investment in grain handling and livestock processing	1. Trend in net investment 2. Variation around trend in investment