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The Role of Marketing Boards in Stabilizing Commodity Markets*

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INTRODUCTION

For two reasons this is an appropriate and timely topic to address at this conference. In the first place, an intensive effort has been made in Canada over the last two years to define and devise "a comprehensive national food strategy." In a word, this has entailed a search for a framework of consistent objectives and a set of synergistic programs that would foster a competitive and development-oriented farm and food sector and be supportive of the wider tasks of improving the performance of the macro economy and furthering Canada's foreign economic policy goals. In this yet-to-be-completed endeavour two matters have been evident: (i) the enhancement of stability in the food system has emerged as a priority task of public policy and, (ii) there has been growing uncertainty about the role of agricultural marketing boards. The two are interrelated since marketing boards are viewed as institutions potentially suited to furthering stability in the food system, and by extension in the broader economy. Thus, this occasion is, in the first instance, a stimulus for an exploratory foray into an evaluation of the influence on stability of some of Canada's producer marketing boards.

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Secondly, we are well aware that food policy, stabilization, and alternative marketing arrangements for farm products are three strands in the on-going debate on agriculture and food policy issues in the United States. Accordingly, we welcome the opportunity to share some of the lessons of Canadian experience with our American colleagues.

Stabilization

Stabilization has long been a dominant theme of Canadian agricultural policy. Indeed, with the notable exception of the treatment accorded the milk industry, successive Canadian governments have approached the sustained transfer of income to farmers -- the major objective of farm policies in most developed countries -- with caution and moderation. Instead, a major purpose of Canadian agricultural policy has been to attenuate unplanned fluctuations in farm output, commodity prices and farmers' incomes, and to transfer to the public sector a part of the private costs of such variation.

The unprecedented turbulence in world and national commodity markets witnessed during this decade has been interpreted as validating the stabilization thrust of Canadian farm policy, and has motivated a deepening of the commitment to the stability objective.

In our judgement, the most weighty consideration that has led to the elaboration and extension of stabilization programs has been the desire to respond to the plight of the traditional constituents, primary producers. Public policy has been primarily concerned to safeguard the welfare of farmers in a period of sharp variations in product prices and input costs. The greater economic vulnerability of individual producers in an industry characterized by growing specialization and more

inflexible cost structures has lent force to the demands for, and the utility of, interventions with this intent.

Other considerations have also had an influence however. Stability in the food sector has been perceived as a necessary condition for general price stability in an economy in which increases in food prices have a ratchet effect on the rate of inflation. Additionally, it has been claimed that farmers must be provided with a stable economic environment if they are to have the incentives, and the means, to make the investments needed to expand output to meet the rising demand for food in a world plagued by hunger and food insecurity. And, faced with retail food prices fluctuating wildly about a rising trend, restive consumers have emerged as an important new constituency for stabilization policies in the food system.

Despite the prominent and ascendant position of stability as an objective of Canadian farm and food policy, public debate on the fundamental precepts of stabilization policy has been sparse and professional analytical work on the topic has been episodic. However, policy development in this area seems to have been guided by discernible assumptions.

First, while recognizing that some degree of market variation is necessary and thus desirable, there has been a presumption that the fluctuations observed in unregulated markets are excessive, and hence dysfunctional. The corollary of this conviction is that intervention to reduce variation can potentially add to social utility. A second assumption has been that the benefit-cost ratios that attach to public policies designed to reduce variation in target variables are favourable, and, further, that their benefits are widely shared and their costs

equitably borne. Thirdly, gains in social utility were anticipated to flow from two sources: increased efficiency in resource use and in consumption, and a more appropriate distribution of the incidence of the costs of instability and of adjusting to change. As to the first of these, considerable weight appears to have attached to the proposition that, in the presence of uncertainties, lags and risk aversion, investment-production and expenditure-consumption decisions would be more nearly socially optimal if market participants were shielded from shorter term market perturbations and guided only by longer term secular market trends. Gains in distributive justice were presumed to arise from the avoidance of the large, arbitrary and oft-times regressive income redistributions associated with market fluctuations, and reinforced by the view that society as a whole should share with farmers the risks associated with expanding output to contain food price increases and to meet rising demands in national and foreign markets.

Other characteristics of the fragmentary debate and sporadic analyses that Canadian agricultural and food stabilization policies have generated are worth remarking. There has been considerable ambiguity as to which of several categories of market instabilities ought to be countered and with what priority, and a corresponding lack of specificity about which of the many candidate variables should have the amplitude, frequency, abruptness and predictability of their variation altered by which programs and to what degree. There has been scant evidence of the influence of such concepts as an optimum mix of stabilization programs and of the rising marginal cost of reducing variation. The relationships between the impacts of stabilization measures on individual producers, commodity markets, farming, the food system and the larger

economy have been none too clear. Practical policy formulation appears to have been untouched by the finer points of formal theorizing about the size and distribution of welfare gains from price stabilization that recently have been the subject of so much professional debate (Just, Turnovsky). More worrisome, policy making appears to have been untroubled by the proposition that investment over a period might be larger, and efficiency enhanced, in an environment of unstable prices and incomes (Robinson). And finally, the possibilities that the expectations of governments might be inferior to those of the collectivity of private market participants, and that imperfections and changes in stabilization-oriented policies might themselves be a source of uncertainty as destabilizing as market variation, have often been mooted but never explored.

An inventory of the programs deployed in Canada to enhance stability in the food sector, or to attenuate and redistribute the ill effects of instability, would have to include crop insurance, market information and indicative planning, aspects of international trade policy, and the use of storage subsidies and cash advances to encourage orderly marketing. However, primary reliance has been placed on three programs. The Agricultural Stabilization Act provides floor prices (adjusted for changes in cash costs) for a wide range of crop and livestock products. Second, the Western Grain Stabilization Act guarantees that the net cash flow (gross receipts less cash costs) of grain growers in the Prairie region will not fall in the current year below the average of the previous five years. Thirdly, and most pertinent to this paper, there are the market control plans operated by a variety of national and provincial agencies. This triad of programs has three features in common: they are

directed at the farming component of the food system; they are designed to reduce variation in the prices (or gross margins) of commodities on an industry-wide basis; and they are assymetrical insofar as they are concerned to limit only down-side market price fluctuations.

Marketing Boards

A distinguishing feature of institutional arrangements in the Canadian food system, and of Canada's farm and food policy, is the extent to which the first-stage marketing of farm products is controlled by mandatory agencies. There can be only a handful of Canadian farmers who do not sell one or more of their products to, through, or on terms determined by a compulsory marketing organization of one form or another. Furthermore, the direction of development of public policy has been toward the extension of mandatory centralized marketing. The number of marketing boards and their share of farm cash receipts has risen from 66 and 13 per cent in 1958 to close to 100 and 60 per cent at the present time (Agriculture Canada). National agencies have been created to coordinate the activities of provincial marketing boards. And some boards have been granted additional powers that strengthen their influence on commodity markets.

The generic term "board" conceals the diverse nature of the market control agencies found in Canadian agriculture. The most numerous are the producer cartels, the marketing plans of which are provincial in scope. These boards exercise powers sanctioned by provincial legislation and delegated by provincial regulatory bodies. Such boards are run by elected farmer directors. An extension of these are the national agencies in place for eggs and turkeys and in prospect for chicken broilers that

supplement provincial boards by operating national supply management programs for these commodities. Such agencies are established under federal legislation, and their directors -- a majority of whom are farmers -- are appointed by both the federal government and the provincial boards. The Canadian Wheat Board and the Canadian Dairy Commission are directly responsible to the federal government rather than to farmers, though their primary function is, of course, to implement policies tailored to the interests of producers of grains in the Prairie region and of industrial milk. To compound the confusion, the bodies that delegate powers to, and oversee the activities of, the producer-controlled provincial and national marketing agencies are also called boards in some jurisdictions. This paper is concerned only with the first two categories of boards.

The objectives that farmers pursue through their marketing boards are income stability, income enhancement, economic security, equity in their access to and their treatment in markets, and control of their economic destinies. These are objectives with wide legitimacy in our society (Shaffer).

To attain these objectives, marketing boards have been given wide-ranging powers to regulate production, pricing and marketing practices. These powers are used in two broad ways (Forbes). First, boards seek to expand markets and to improve their operational and pricing efficiency. Secondly, they try to improve the farmer's position in the market by such practices as restricting entry into production, controlling long-run industry output, neutralizing short-run surplus supplies, unilaterally setting selling prices for raw products, bargaining collectively on prices and terms and conditions of sale, allocating product to

differentiated markets and controlling the rate of flow of product into consumption. The ability to do several or all of these things provides the influence that boards have on market stability.

The mounting wave of disaffection with marketing boards with which farmers are having to contend centres on marketing boards with supply management and/or price setting powers. The concern is that such boards have misused their powers in ways which exacerbate inflation, balkanize the national market, nurture a "Fortress Canada" posture, lower efficiency in production and marketing, provide excessive returns to resources, generate inequities in income distribution and erode entrepreneurial freedom. The boards and their advocates have sought vigorously to refute these specific charges. More particularly to the purposes of this paper, an important part of the defence of marketing boards has been to emphasize the positive contribution that their practices make to stability. Specifically, the objective of boards of enhancing stability has been invariably and explicitly invoked to justify their creation and their activities; much has been made of the proposition that the attainment of this objective promised benefits to all food system participants; and it has been protested that benefits secured from this source should be counted against any negative effects of their programs.

Interestingly, the claim that marketing boards do enhance stability has not been extensively tested.[1/] It is to that, that we now turn.

1/ The subject was tentatively addressed in several reports of the Food Prices Review Board in the period of its existence, 1974-76. Loyns drew extensively on this work and contributed additional material (Loyns).

EMPIRICAL ANALYSIS

The objective of this paper is to provide tentative evidence on the stabilizing impacts of several producer-controlled marketing boards in Canada that exhibit a spectrum of degrees of control of their markets.

Procedures

To test the hypothesis that Canadian marketing boards have been successful in reducing market instability, the variation in four market variables - industry output, producer price, industry gross revenue and consumer price - was examined empirically for five commodities - pork, tobacco, chicken broilers, turkeys and eggs. The marketing of each of these five commodities is regulated by a producers' marketing board,[1/] and the degree of market control increases from first to last over the sequence in which they are listed.

In general, for each commodity except tobacco, monthly data were obtained and each set of data was broken into two time periods. The second period began when some major institutional development in marketing board arrangements occurred which represented a greater degree of market control, and thereby of the potential to influence market stability.

It is apparent that many factors affect market fluctuations other than the presence and the policies of marketing boards. Accordingly, data for the same variables, commodities and time periods were obtained

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1/ Grains and industrial milk were excluded from the analysis since the major direct influences on the performance of the markets for these commodities are the policies of the federal government and its agencies rather than the practices of producers' marketing boards.

for the United States and compared with those for Canada. It was hoped that the U.S.-Canada comparisons would give a further measure of the potency of the Canadian boards' stabilizing influence, on the assumption that these contiguous and like markets would otherwise behave in a similar manner.

For each commodity and time period, means and standard deviations of the year-to-year percentage changes in monthly producer price, output and industry revenue were calculated.[1/2/] This procedure eliminates any inherent seasonality in the series and provides measures of variation

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1/ There are many conceptual and empirical difficulties in the measurement of instability (Horesh). The conventional coefficient of variation was found to give misleading results because of interaction between the magnitudes of means and standard deviations.

2/ The reader should be alert to the fact that a number of data limitations bedeviled the analysis. Particular note should be made of the following:

a) For the broiler sector, national average producer prices (weighted by provincial marketings) and total Canadian production are employed for Canada. These were available from an earlier study (Farrow). For turkeys and eggs only Ontario data were employed because of difficulties in obtaining a consistent provincially-weighted price series. While Ontario represents a substantial portion of Canadian production for these commodities, there may be variations in the Ontario data which are not reflected in national data, or vice versa. For pork, data representing Eastern Canada are employed for similar reasons, as well as the fact that important linkages exist between the Quebec and Ontario production sectors. Producer prices for hogs for Eastern Canada are represented by the Toronto market.

b) Given that no revenue series are reported for these products on a monthly basis, the revenue series used here are the product of monthly marketings and the average monthly price for the most frequently quoted grade. No attempt is made to adjust the revenues for variations in gradings, marketings of breeding stock where applicable, or spatial price differences within regions. Hence the revenue series is a proxy.

c) Retail price series for eggs and turkeys in Canada were available only as indices, while those in the U.S. are expressed in currency units.

resulting from both trend and variations around trend. The stability of prices facing consumers was measured by calculating the means and standard deviations of the month to month percentage changes in retail prices. All means and standard deviations were subjected to the usual t and F-tests to determine whether significant differences existed between periods and countries.

Tobacco was treated somewhat differently. Since this commodity is produced seasonally rather than continuously, only annual data were used. Secondly, because there have been no substantial changes in board policies influencing stability since 1960, only one time period was analyzed. Third, retail prices for tobacco products were not examined because of their tenuous relationship to raw leaf prices. And finally, because the U.S. market for flue-cured tobacco is also strongly controlled, producer prices and output in Canada were compared with world prices and production, the U.S. export price being taken as a proxy for the world price.

Results of the Analysis

The results of the analysis for each commodity are presented below. Each commodity is discussed separately. A brief description of the types and degree of market control exerted by each board is presented first. This is followed by a presentation of the data, means and standard deviations of the percentage changes in each variable and of the inferences drawn.

Pork:

The provincial pork boards do not have direct control over either production or prices and only modest tariff protection is provided

against imports. Only Ontario and two of the Maritime provinces have pork marketing boards, but all of Eastern Canada is included in the analysis for the reasons cited. As it happens, no significant changes have occurred in marketing board policies since 1965 which affect market stability. Nonetheless, the data series for hogs are divided into two periods (1965-71 and 1972-77) to provide a comparison with the other commodities.

Data on hog production, producer prices, revenue and retail prices in Eastern Canada and the United States are presented in Figure 1 for the periods 1965-71 and 1972-77 respectively. Means and standard deviations of the year to year percentage change in monthly production, producer prices and revenue are presented in Table 1. Where the means or standard deviations are significantly different between countries within a time period, the Canadian statistic is marked by an asterisk. Where the statistics are significantly different between time periods, the statistic is marked by an "α". Similar notation is used throughout the remainder of this section.

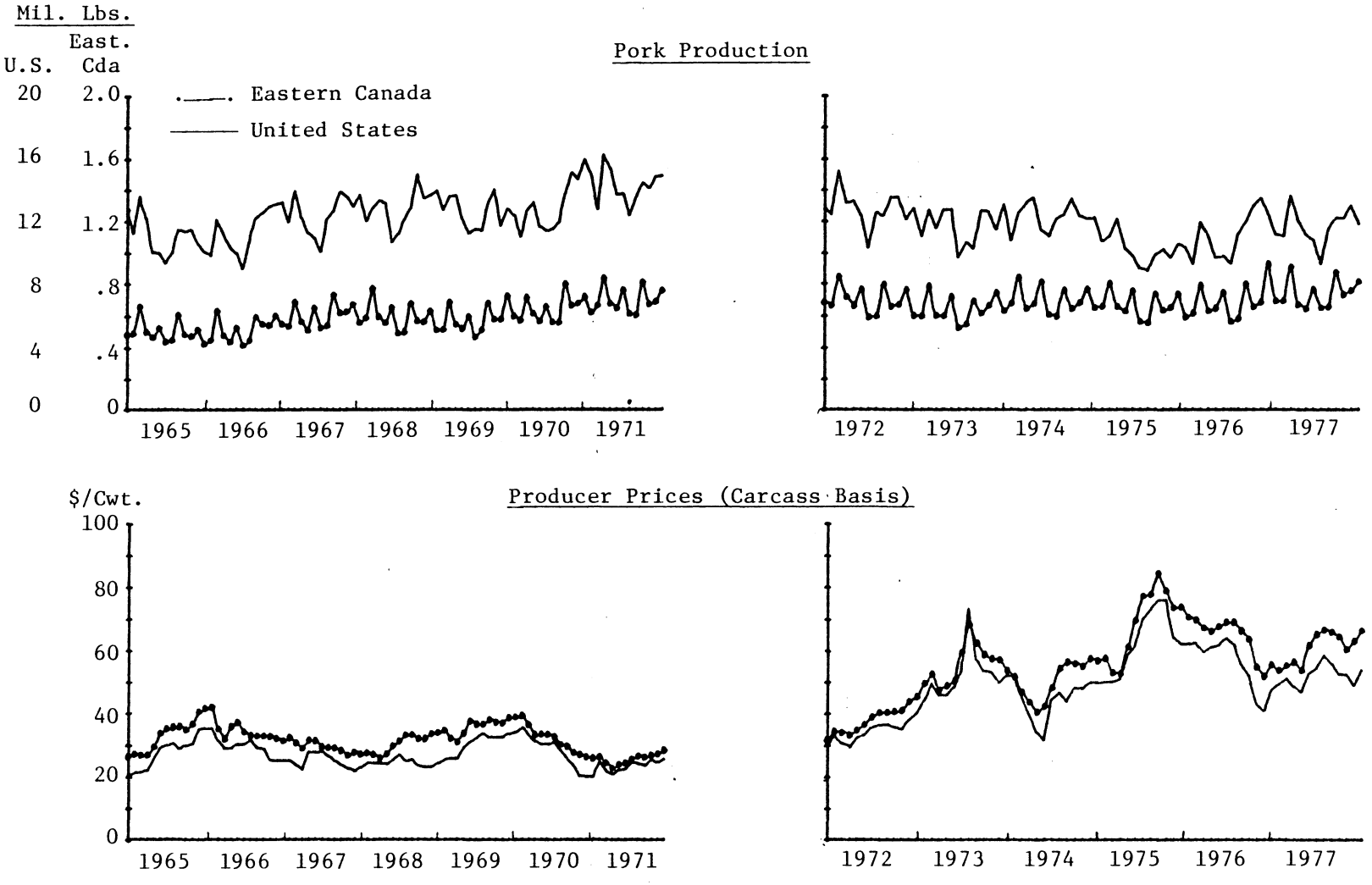
Three inferences result from the analysis. First, less variation occurred in Canadian supply than in U.S. supply after 1971, while the rate of increase in supply fell in both countries.

Second, in the later period less variation has existed for Eastern Canadian producer prices than for the United States. However the rates of increase and the variability of prices increased in Canada, as they did also in the U.S., after 1971.

Third, the rates of increase and variability in revenue increased for both countries after 1971.

Means and standard deviations for year to year and month to month

Figure 1. Production, Producer Prices, Revenue and Retail Prices for Pork, Eastern Canada and United States, 1965-71 and 1972-77



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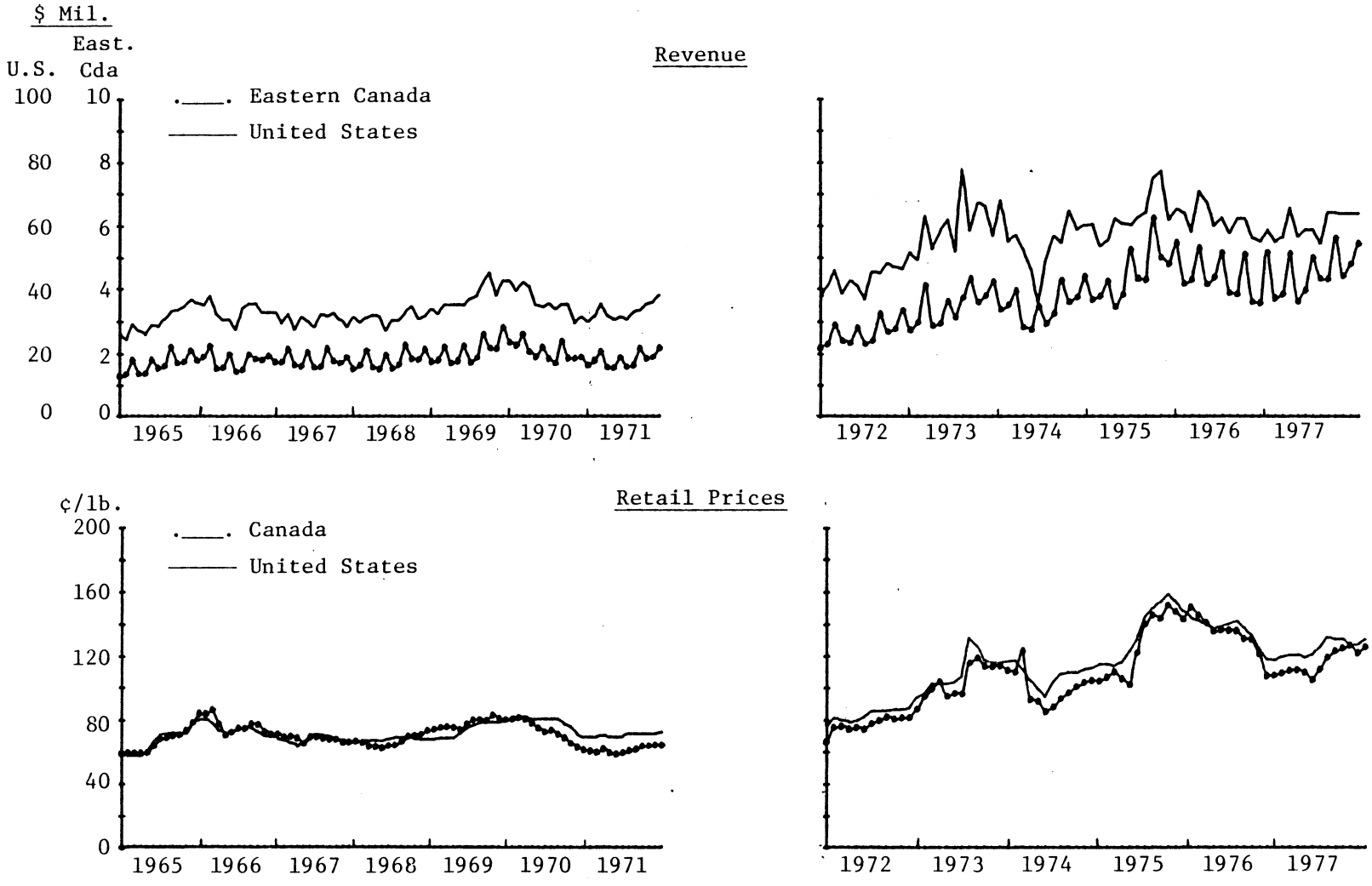


TABLE 1. Means (μ) and Standard Deviations (S.D.) of Year to Year Percentage Changes in Production, Producer Prices and Revenue for Pork, Eastern Canada and the United States, 1965-71 and 1972-77

	Production		Producer Price		Revenue	
	μ	S.D.	μ	S.D.	μ	S.D.
1965-71:						
Eastern Canada	6.13	10.86	1.61	20.41*	2.88	15.27
United States	4.80	10.80	.79	25.46	3.30	17.17
1972-77:						
Eastern Canada	1.49$^{\alpha}$	9.21*	13.57$^{\alpha}$	27.67*$^{\alpha}$	13.27$^{\alpha}$	20.39$^{\alpha}$
United States	.85$^{\alpha}$	14.71	14.17$^{\alpha}$	34.80$^{\alpha}$	9.38$^{\alpha}$	23.03$^{\alpha}$

* - indicates significant differences between countries within time periods.
α - indicates significant differences between time periods within countries.
Means were tested for differences at the 90% probability level.
Standard deviations were tested at the 95% probability level.

TABLE 2. Means (μ) and Standard Deviations (S.D.) of Year to Year and Month to Month Changes in Retail Prices for Pork, Eastern Canada and the United States, 1965-71 and 1972-77

	Year to Year % Change		Month to Month % Change	
	μ	S.D.	μ	S.D.
1965-71:				
Eastern Canada	.29	16.56*	.17	3.29
United States	1.99	13.08	.33	2.77
1972-77:				
Eastern Canada	11.62$^{\alpha}$	25.62*$^{\alpha}$	1.12	6.43*$^{\alpha}$
United States	10.45$^{\alpha}$	20.51$^{\alpha}$	.85	4.48$^{\alpha}$

* - indicates significant differences between countries within time periods.
α - indicates significant differences between time periods within countries.
Means were tested for differences at the 90% probability level.
Standard deviations were tested at the 95% probability level.

percentage changes in retail prices are presented in Table 2.[1/] It can be concluded that the rate of change and variability of retail pork prices increased for both countries after 1971 and Canadian retail prices were more variable than retail prices in the United States.

Flue-cured Tobacco:

Ontario produces approximately 90 per cent of Canada's flue-cured tobacco. The Ontario marketing board controls output with production quotas.[2/] Prior to 1976, the board itself exerted no direct control over prices. Since that time the board has negotiated a minimum price for each grade with processors. There is no quantitative control of imports, but there is a 30¢ per lb. tariff on stemmed tobacco.

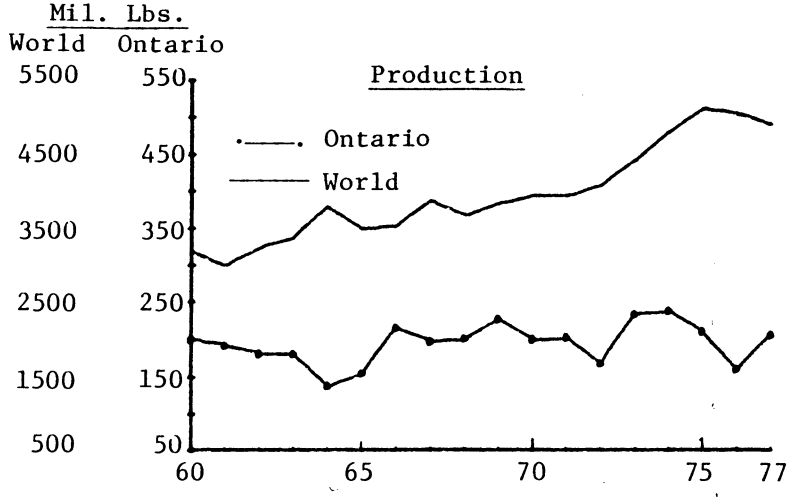
Ontario and world tobacco production, prices and revenue are presented in Figure 2. Means and standard deviations of the year to year percentage changes are presented in Table 3.

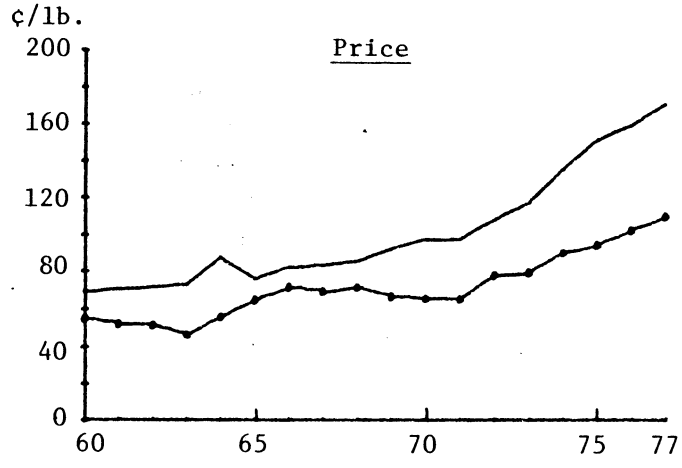
The analysis shows that the variability of both production and revenue in Ontario has been greater than in the world market, but that there has been no significant difference in the variation of price. The latter conclusion is not surprising since Canada is a net exporter of tobacco and Canadian prices are, therefore, closely tied to the world price (Huff, Perkins and Smith).

1/ Retail price statistics for Canada do not exist as they do for the United States. The Canadian series used here is for Boston Butt. Use of prices for only one cut may be responsible for the greater variation in Canadian data.

2/ Prior to 1976, quotas were allocated on an acreage basis. Now it is done on a poundage basis. The current approach was initiated because of problems in controlling output and declining product quality brought about by input substitution.

Figure 2. Production, Prices and Revenue for Flue Cured Tobacco, Ontario and World Markets, 1960-1977





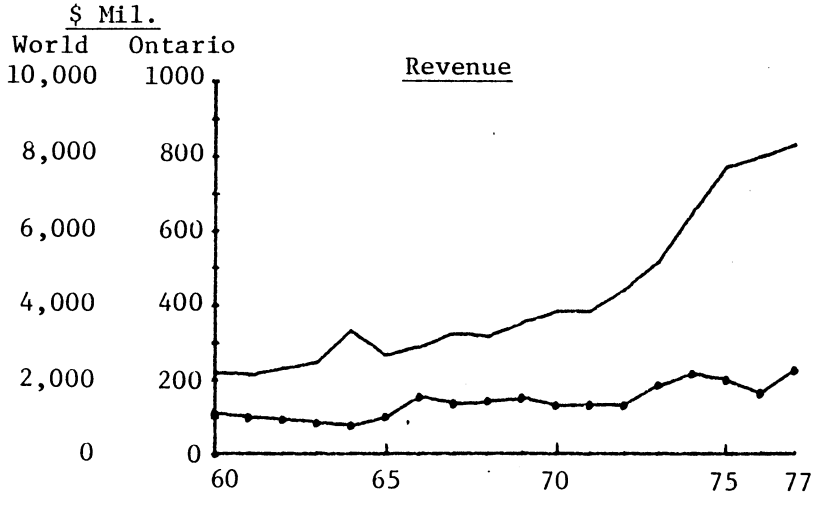


TABLE 3. Means (μ) and Standard Deviations (S.D.) of Year to Year Percentage Change in Production, Producer Prices and Revenue for Flue-Cured Tobacco, Ontario and the World Markets, 1960-1977

	Production		Price		Revenue	
	μ	S.D.	μ	S.D.	μ	S.D.
Ontario	1.83	19.58*	4.56	9.41	6.27	22.00*
World	2.76	6.00	5.71	7.20	8.90	12.38

* - indicates significant differences between countries within time periods.
α - indicates significant differences between time periods within countries.
Means were tested for differences at the 90% probability level.
Standard deviations were tested at the 95% probability level.

Chicken Broilers:

Provincial marketing boards for broilers were introduced in Canada beginning in the early 1960's. All provinces were under board control by 1971. To reflect this situation, the data series are divided into two periods (1965-71 and 1972-77). The later period reflects considerably more market control on the part of the boards. The largest producing province (Quebec) came under board control in 1971. Thereafter Ontario and Quebec, which together account for about 75 per cent of Canada's production, entered into a market share agreement under which changes in output in the two provinces are made in concert. Board decisions among all the provinces are now informally coordinated.

The provincial broiler boards establish minimum prices (in Ontario for four quota periods per year) based on a production cost formula. They then establish production quotas in an attempt to produce only the output that they anticipate can be sold at these prices. Because of the difficulty in forecasting accurately, inventories play a major role in clearing the broiler market. If inventories begin to build up, the boards may lower the minimum price within a quota period and/or lower quotas in the subsequent period. There are no quantitative restrictions on imports, but a 12½ per cent tariff, with a minimum of 5¢ per lb., is imposed on eviscerated imports.

Data on production, production plus inventories (to obtain a measure of availability), producer prices, revenue and retail prices for broilers in Canada and the United States for the periods 1965-70 and 1971-77 are presented in Figure 3. Means and standard deviations of the year to year percentage change in production, production plus inventories, producer prices and revenue are presented in Table 4.

The post-1970 period for broilers was further segmented to focus on the period from 1974 to 1977. The resulting means and standard deviations are also shown in Table 4. This was done because the U.S. price freeze in 1973 had substantial impacts on prices. Hence the post-1973 data reduce the impact of that phenomenon and provide a more representative view of the market during the 1970's. Tests for significant differences between time periods in Table 4 were performed by comparing the statistics from 1966-70 with those from both 1971-77 and 1974-77.

Four inferences may be drawn from the analysis. First, no change in the variation in Canadian supply occurred after the move toward more marketing board control in 1971. However, the rate of increase in Canadian supply declined.

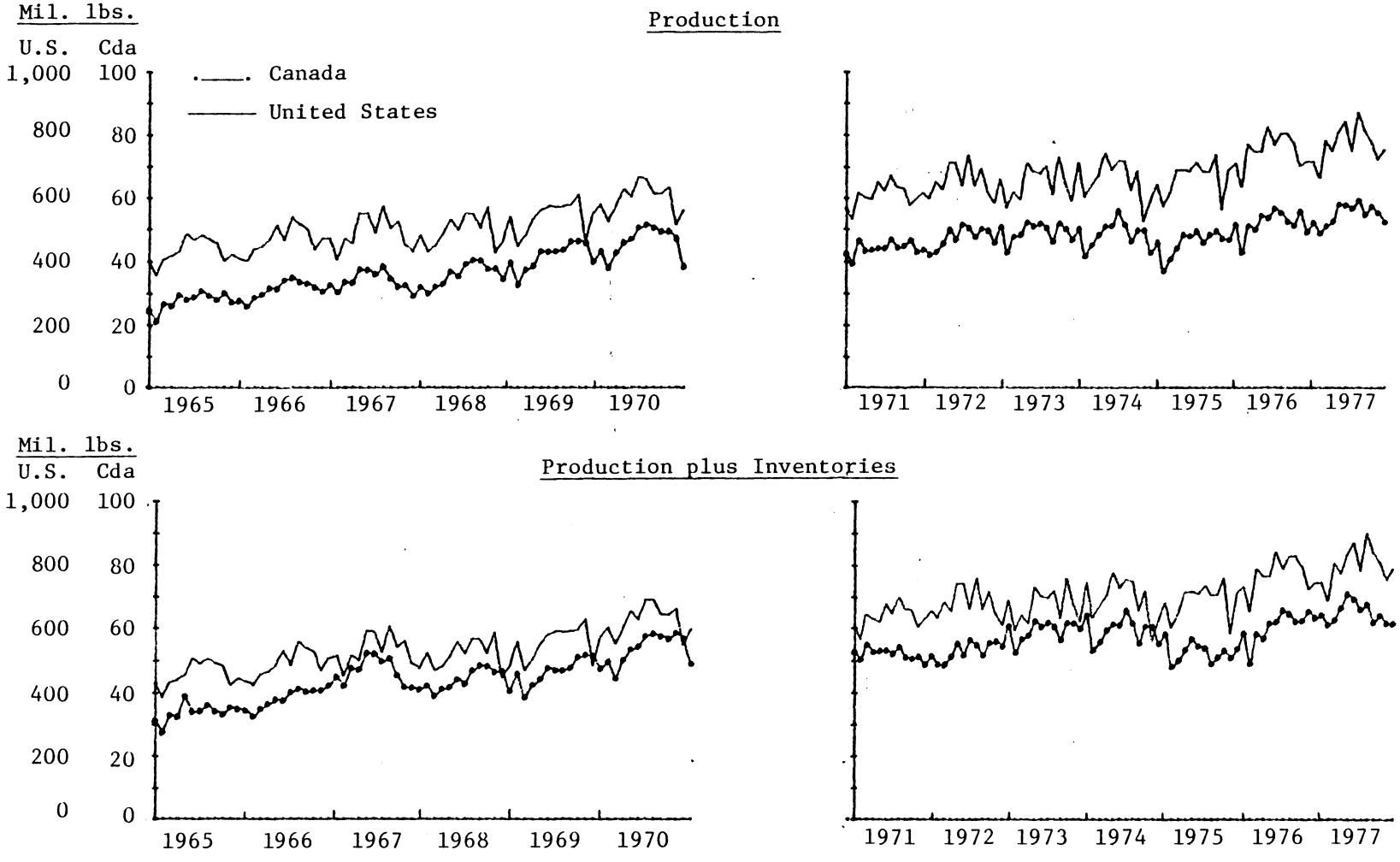
Second, total availability of product (production plus inventories) in Canada has been more variable than in the U.S. and no change in variation occurred after 1971. The rate of increase in availability declined after 1971.

Third, the variation in Canadian producer prices declined after 1973 while producer prices in the U.S. fluctuated even more widely than they had before 1971.

Finally, the variation in Canadian revenue from broilers was smaller relative to the United States after 1971, but was not less variable than it had been in Canada before 1971. At the same time, the rate of growth in Canadian revenue declined after 1973.

Means and standard deviations of year to year and month to month percentage changes in retail prices for broilers are presented in Table 5 for the periods 1965-70, 1971-77 and 1974-77. The analysis shows

Figure 3. Production, Production plus Inventories, Producer Prices, Revenue and Retail Prices for Chicken Broilers, Canada and United States, 1965-70, 1971-77



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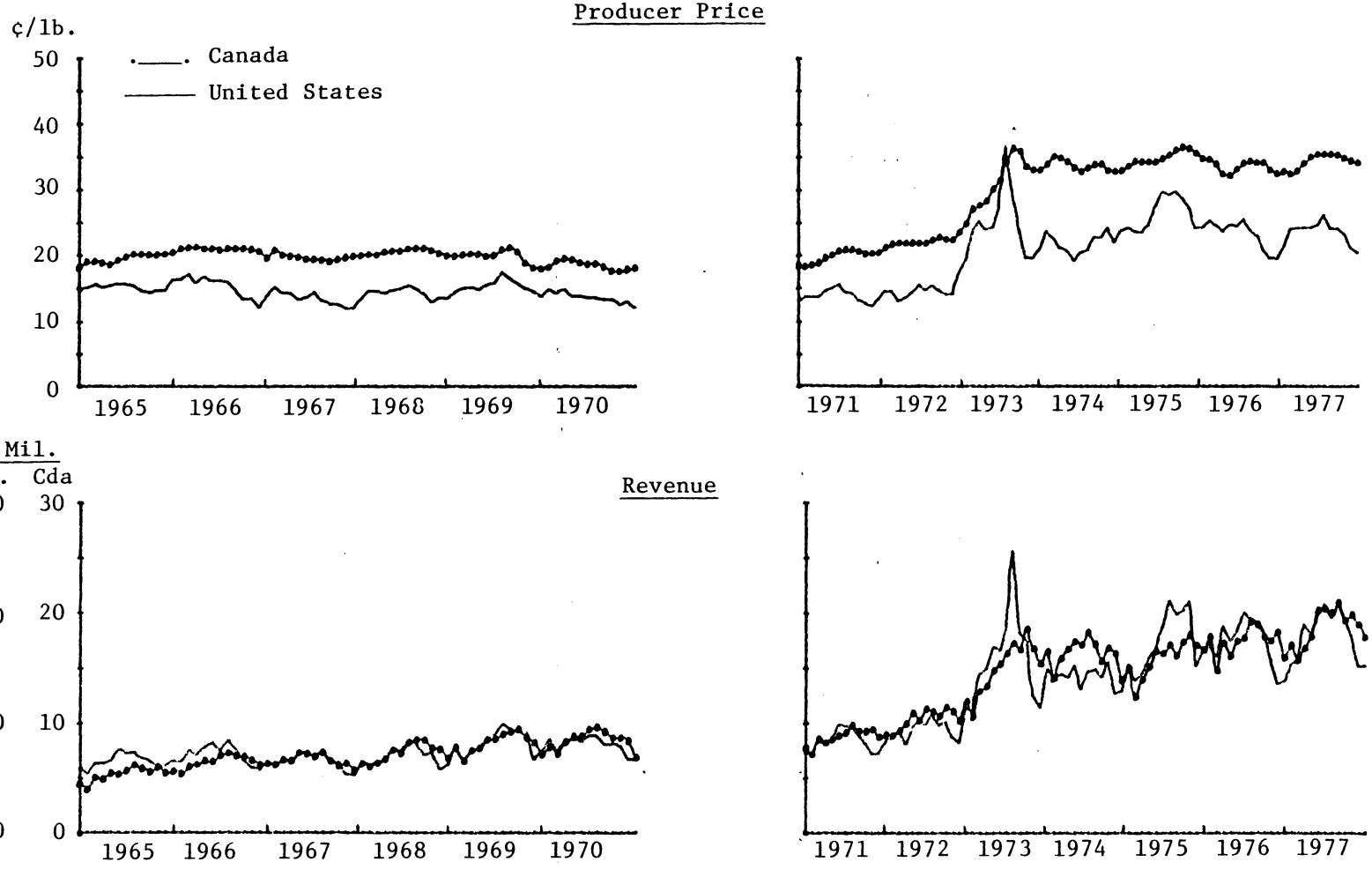

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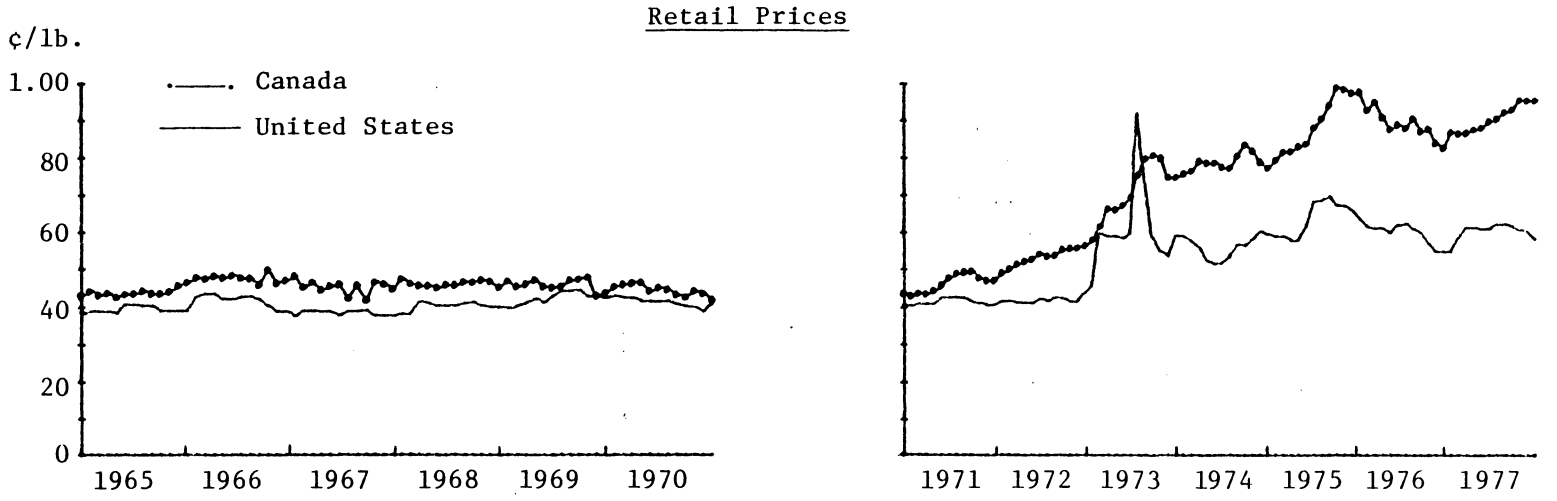

TABLE 4. Means (μ) and Standard Deviations (S.D.) of Year to Year Percentage Changes in Production, Production Plus Inventories, Producer Prices and Revenue for Chicken Broilers, Canada and the United States, 1965-70, 1971-77 and 1974-77

	Production		Production and Inventories		Producer Price		Revenue	
	μ	S.D.	μ	S.D.	μ	S.D.	μ	S.D.
1965-70:								
Canada	11.29*	8.10	10.74*	13.00*	-0.78	7.10*	10.36*	10.73
United States	6.87	6.71	6.87	7.45	-1.52	10.93	5.05	11.91
1971-77:								
Canada	3.96α	8.13	4.32α	11.12*	10.72α	16.88*α	14.87α	17.82*α
United States	4.31α	7.90	4.11α	7.54	13.19α	32.53α	17.04α	30.06α
1974-77:								
Canada	4.48α	9.74	3.83α	14.05*	0.78	5.42*α	5.14α	9.79*
United States	5.63	8.49	5.13	7.91	4.04α	17.82α	9.25	16.73α

* - indicates significant differences between countries within time periods.
α - indicates significant differences between time periods within countries.
Means were tested for differences at the 90% probability level.
Standard deviations were tested at the 95% probability level.

TABLE 5. Means (μ) and Standard Deviations (S.D.) of Year to Year and Month to Month Changes in Retail Chicken Broiler Prices, Canada and the United States, 1965-70, 1971-77 and 1974-77

	Year to Year Changes		Month to Month Changes	
	μ	D.S.	μ	D.S.
1965-70:				
Canada	0.49	6.04	0.03	3.81
United States	1.13	7.10	0.17	3.05
1971-77:				
Canada	12.73α	13.65*α	0.99α	2.74*α
United States	8.61α	23.12α	0.73	8.23α
1974-77:				
Canada	5.38α	10.77α	0.55	2.57*α
United States	3.09	11.94α	0.0009	3.40

* - indicates significant differences between countries within time periods.
α - indicates significant differences between time periods within countries.
Means were tested for differences at the 90% probability level.
Standard deviations were tested at the 95% probability level.

first that the variation of year to year changes in Canadian retail prices were greater after 1971 than before, and the variation of Canadian retail prices was not different than for the U.S. Moreover, the rate of increase in retail prices for Canada was greater after 1971. By contrast, after 1974, variations in month to month changes in Canadian retail prices became smaller than in the United States and smaller than before 1971.

Turkeys:

Both provincial boards and a national marketing authority exist for turkeys. The provincial boards establish prices and production in much the same manner as is done for chicken broilers. Import tariffs are established at the same levels as for broilers but, with the creation of a national marketing board in 1974, an import quota equal to 2 per cent of national production was introduced.

While provincial boards have existed for several years, the time series for analysis is divided into two periods (1965-73 and 1974-77) to reflect the greater market control obtained by the formation of the national authority in 1974 and the simultaneous introduction of quantitative restrictions on imports. Furthermore, because of the extreme seasonality in production, only the last five months of producer prices, production and revenue for each year are included in the analysis.

Data on production, producer prices, revenue and retail prices are presented in Figure 4 for Ontario and the United States for the periods 1965-73 and 1974-77. Means and standard deviations of the year to year percentage changes in production, producer prices and revenue are presented in Table 6.

The analysis supports the following inferences. First, fluctuations

in Ontario's turkey production did not change after formation of the national marketing authority in 1974. Moreover, fluctuations in Ontario's production are greater than for the United States.

Second, while fluctuations in producer prices were reduced for both Ontario and the United States after 1974, the fluctuations in Ontario were smaller than for the U.S. after 1974.

Third, while revenue was less variable in both Ontario and the United States after 1974, revenue in Ontario was more variable than in the U.S.

Means and standard deviations of year to year and month to month percentage changes in retail prices are presented in Table 7. The analysis shows first that both the rate of increase and variation in the annual change in retail prices were greater in Canada than in the United States after 1974. Secondly, month to month variability in Canadian retail prices is greater than for the U.S.

Eggs:

Provincial egg marketing boards were established during the 1960's and a national agency was instituted in 1973. Currently, the national board establishes production quotas for each province. The provincial boards in turn establish prices for table eggs, based on a production cost formula, and allocate quota to individual producers within the province. If eggs produced within the provincial quota can not be sold on the table market, they are sold to the national agency. The national agency then sells the "surplus" eggs to the breaker (processing) market - usually for considerably less than acquisition prices. To finance the "losses" from surplus disposal the national marketing board charges a levy for surplus disposal which is deducted from producer prices by the provincial boards.

Figure 4. Production, Producer Prices, Revenue and Retail Prices for Turkeys, Ontario and United States, 1965-73 and 1974-77

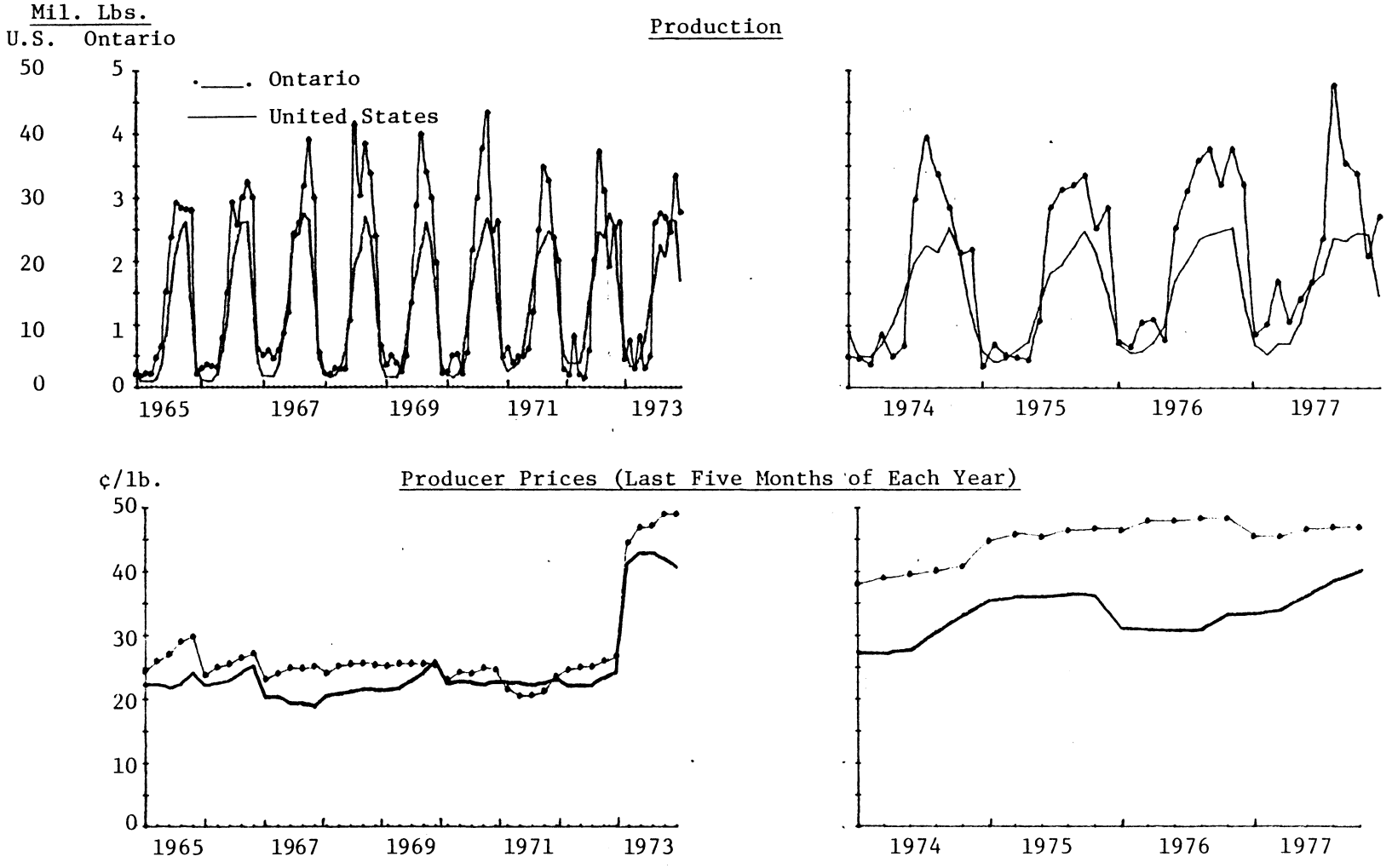

Figure 4 (continued)

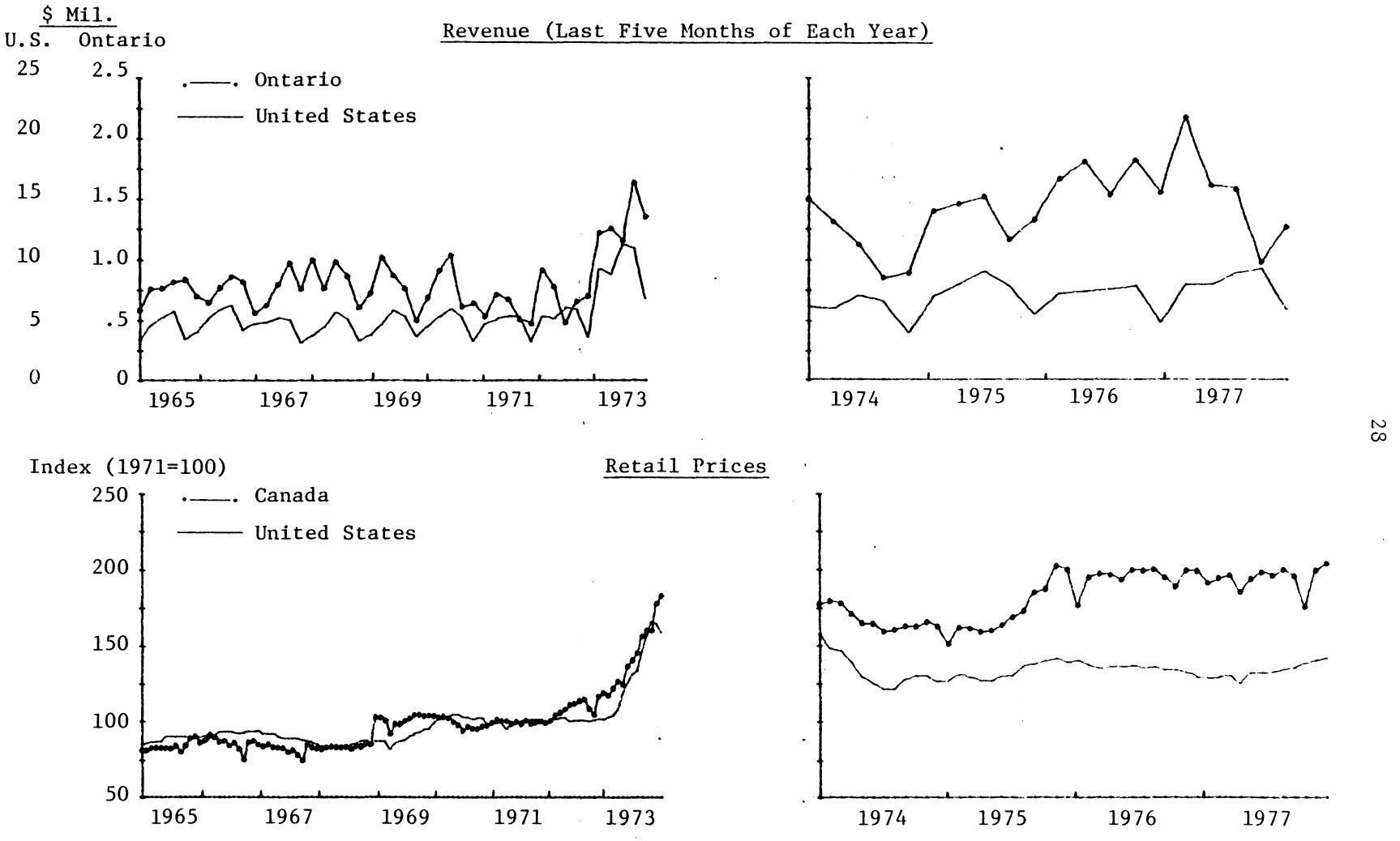

TABLE 6. Means (μ) and Standard Deviations (S.D.) of Year to Year Percentage Changes in Production, Producer Price and Revenue for Turkeys, Ontario and the United States, 1965-73 and 1974-77

	Production		Producer Price		Revenue	
	μ	S.D.	μ	S.D.	μ	S.D.
1965-73:						
Ontario	2.97	24.48*	10.29	30.20	14.25	44.90*
United States	1.92	9.80	11.34	30.12	12.79	28.95
1974-77:						
Ontario	7.99	23.48*	5.77	8.30*α	14.76	28.24*α
United States	3.64	11.47	9.28	18.22α	12.33	16.81α

* - indicates significant differences between countries within time periods.
α - indicates significant differences between time periods within countries.
Means were tested for differences at the 90% probability level.
Standard deviations were tested at the 95% probability level.

TABLE 7. Means (μ) and Standard Deviations (S.D.) of Year to Year and Month to Month Percentage Changes in Retail Prices for Turkeys, Canada and the United States, 1965-73 and 1974-77

	Year to Year Changes		Month to Month Changes	
	μ	S.D.	μ	S.D.
1965-73:				
Canada	7.83	13.78	0.85	4.29*
United States	6.03	14.67	0.61	2.38
1974-77:				
Canada	5.63*	11.08*	0.40	4.62*
United States	.46	7.72	-0.17α	2.64

* - indicates significant differences between countries within time periods.
α - indicates significant differences between time periods within countries.
Means were tested for differences at the 90% probability level.
Standard deviations were tested at the 95% probability level.

With powers to manage supplies, establish producer prices and practice price discrimination, the egg marketing boards likely have more domestic control than any of the other boards analyzed. In addition, imports are prevented from interfering with domestic programs by a restrictive import quota.

Data for the analysis of egg markets is divided into the period before and after 1973 to reflect the introduction of the national marketing agency and quantitative import controls.

Data on egg production, producer and retail prices and revenue for eggs are presented in Figure 5. As indicated earlier, a levy is charged for the national marketing board's losses from diverting surplus eggs to secondary markets. These levies were available only from 1975. Hence, producer prices and revenue net of levies from 1975-77 are also shown in Figure 5. Means and standard deviations of production, producer prices and revenue are presented in Table 8. For producer prices and revenue, these are included for both 1973-77 unadjusted for levies, and for 1975-77 adjusted for levies.

The analysis points to the following inferences. First, no change occurred in variations in Canadian production after 1973. Furthermore it has been consistently less stable than production in the United States. Moreover, the rate of change in Canadian production relative to the United States fell after 1973.

Second, while the variation in producer price declined in both countries after 1973, the variation in producer price for Ontario was not significantly different than in the U.S. At the same time, the rate of increase in Ontario producer prices was higher than for the United States after 1973.

Figure 5. Production, Producer Prices, Revenue and Retail Prices for Eggs, Ontario and United States, 1965-72 and 1973-77

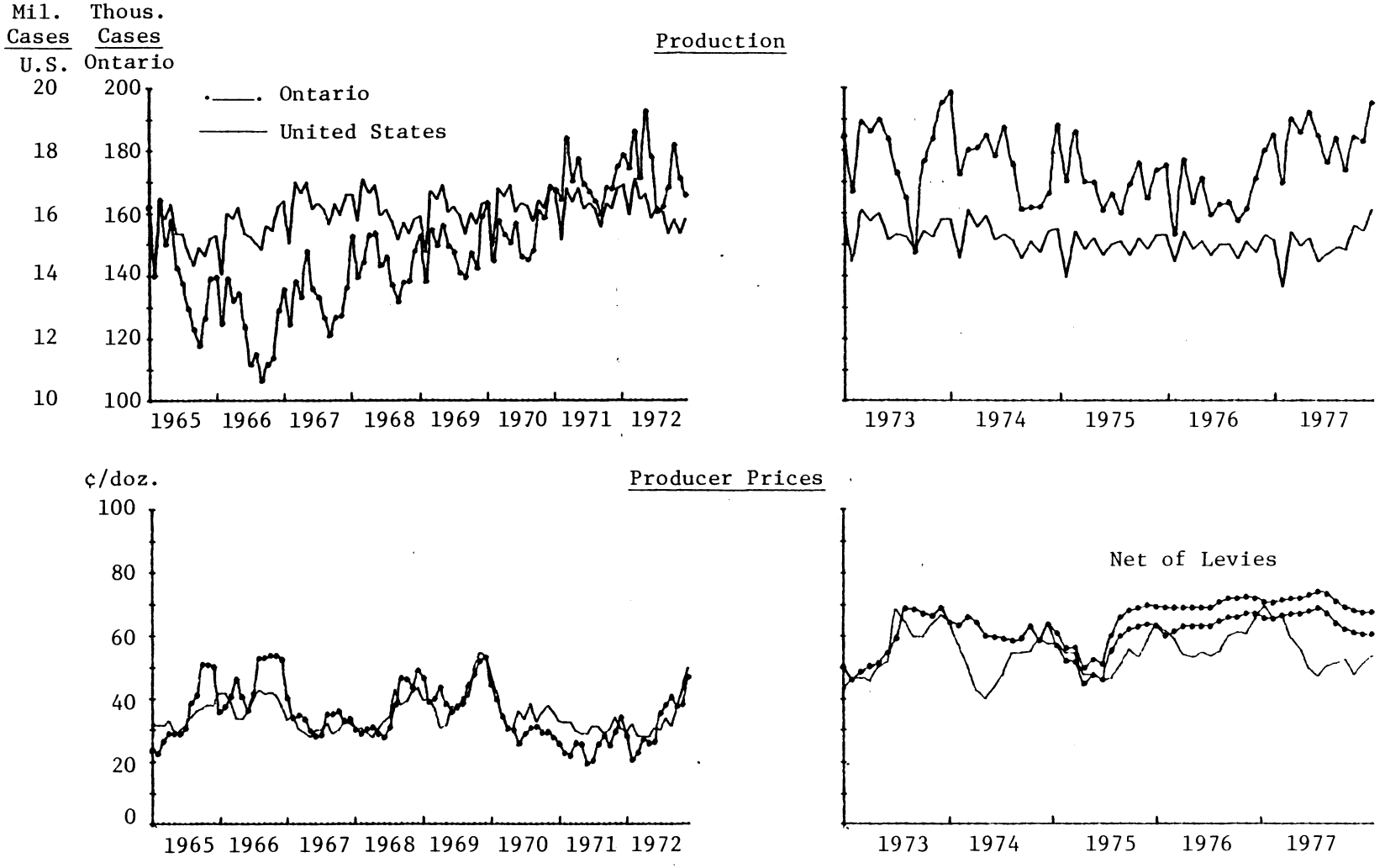

Figure 5 (continued)

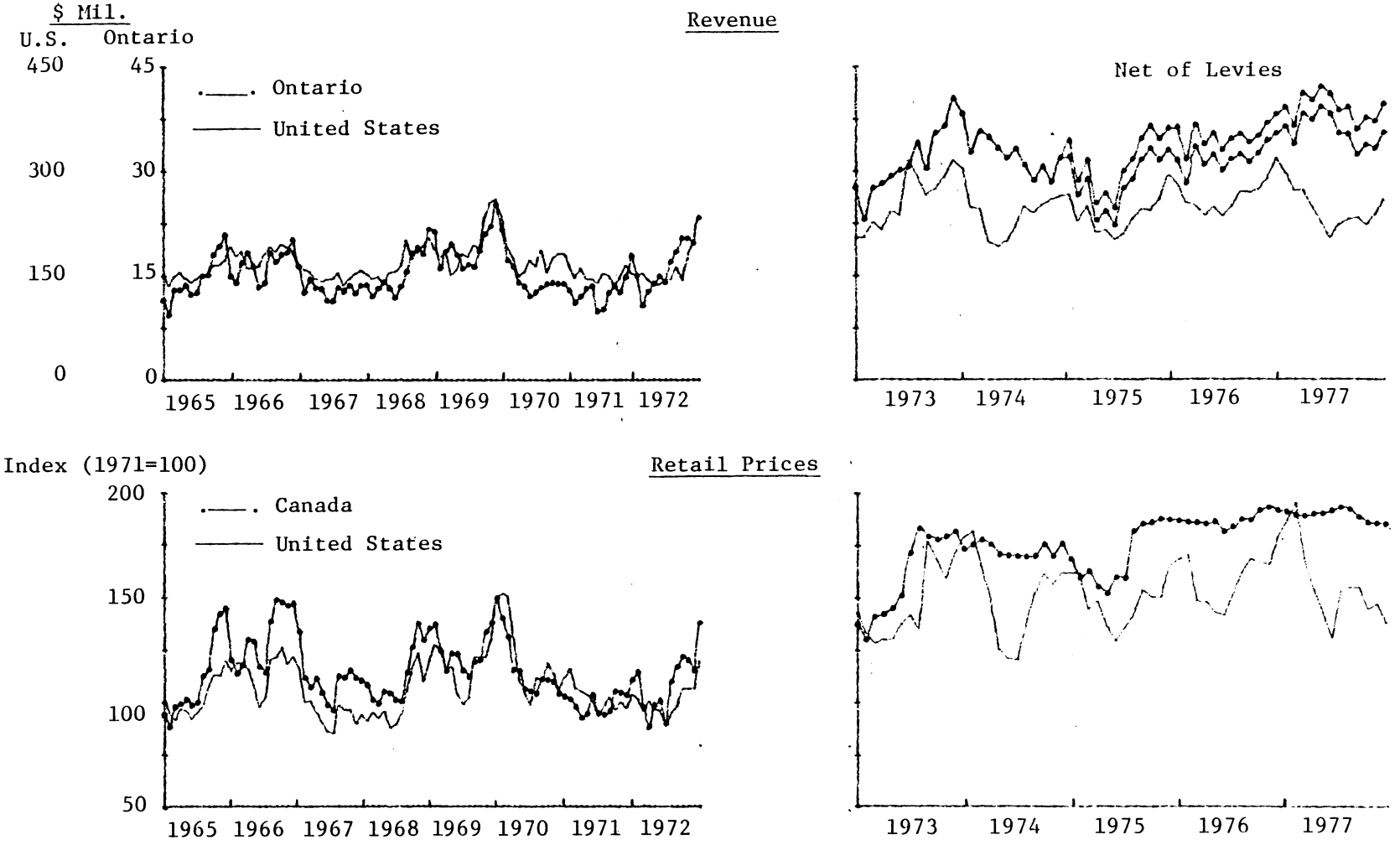

TABLE 8. Means (μ) and Standard Deviations (S.D.) of Year to Year Changes in Production, Producer Price and Total Revenue for Eggs, Ontario and the United States, 1965-72, 1973-77 and 1975-77

	Production		Producer Price		Revenue	
	μ	S.D.	μ	S.D.	μ	S.D.
1965-72:						
Ontario	3.47*	8.20*	3.53	30.94*	5.67	27.51*
United States	0.86	3.11	1.99	20.56	2.26	18.67
1973-77:						
Ontario	1.10α	8.03*α	6.30*	15.4α	7.40*	16.87α
United States	-0.63α	2.20α	0.57	15.0α	-0.14	14.59α
1975-77: (net of levies)						
Ontario	N.A.	N.A.	9.22*	13.41α	12.88*	11.77α
United States	N.A.	N.A.	2.04	13.83α	2.08	12.88α

* - indicates significant differences between countries within time periods.
α - indicates significant differences between time periods within countries.
Means were tested for differences at the 90% probability level.
Standard deviations were tested at the 95% probability level.
N.A.: Not Applicable.

TABLE 9. Means (μ) and Standard Deviations (S.D.) of Year to Year and Month to Month Percentage Changes in Retail Prices for Eggs, Canada and the United States, 1965-1972 and 1973-77

	Year to Year Changes		Month to Month Changes	
	μ	S.D.	μ	S.D.
1965-72:				
Canada	1.17	16.03	0.70	7.82
United States	1.22	16.21	0.44	7.16
1973-77:				
Canada	4.99	10.69*α	0.57	3.57*α
United States	2.73	12.69α	0.28	8.13

* - indicates significant differences between countries within time periods.
α - indicates significant differences between time periods within countries.
Means were tested for differences at the 90% probability level.
Standard deviations were tested at the 95% probability level.

Third, variations in Canadian revenue were not less than for the U.S. after 1973. However, the rate of increase in revenue for Ontario was higher than for the United States.

Means and standard deviations of the year to year and month to month percentage changes in retail prices for eggs are presented in Table 9. The analysis shows that Canadian retail prices were less variable after 1973 than previously and than U.S. prices during the second period.

CONCLUSIONS

Even the most casual student of stabilization policy and of producers' marketing boards will be conscious of the limitations of the foregoing analysis. Any partial analysis of the impact of marketing boards on a single criterion of market performance must be suspect, the more so when there is more than a suspicion that enhancing market stability is a second order priority of most boards. Second, we have done no more than measure the dimensions of observed variation of a few coefficients in selected commodity markets in which boards are present and presumed to have some influence. The multiple factors that cause and temper market fluctuations have not been explored, and ex post one cannot know what the pattern of variation would have been in the absence of the boards, albeit that the comparisons of experience in the Canadian and U.S. markets where different institutional arrangements prevail may be suggestive. Thirdly, we know nothing of the linkages between fluctuations in the variables examined and changes in the probability density functions of the expectations of market participants pertaining to these variables and others to which they are related, or for which they are proxies. Fourth, without knowing the priority rankings that are attached to each variable,

and in the absence of objective performance norms, there is no means of knowing whether the observed variation was planned and optimal, or uncontrolled and excessive or too small. Finally, the measurement of variation, even in a wider range of variables than considered here, is merely a starting point. The real interest lies in establishing the consequences of changes in variation on (i) the expectations and behaviour of firms and households, which is the level at which investment and consumption decisions are made; (ii), the resultant performance of the food sector and the economy in terms of allocative efficiency, progressiveness, and macro-stability; and, (iii) the distribution of the benefits and costs of stabilizing the economic environment. These matters, which are the concerns of policy, are suggestive of the types of studies to which we must progress if the utility of professional research on instability is to be commensurate with its importance as a subject of public policy.

As to the conclusions to be drawn from this initial analysis on the issue of whether producers' marketing boards enhance market stability, the only verdict which is supportable is that found in Scottish jurisprudence, "not proven."

Clearly, relative stability can be observed in regional markets notwithstanding the fact that the boards which operate in them have few control powers - witness the stability of producer prices and output of hogs in Eastern Canada compared with the United States. Conversely, the other boards, all of which have control over supply, appear to have chosen not to stabilize production.

The board for Ontario tobacco seems to be more an instrument for exercising countervailing power against the handful of tobacco buyers and

for restricting access to a highly profitable line of production than of market stability, and such price stability as has obtained for Canadian tobacco has derived primarily from U.S. tobacco price support programs rather than from the operations of the board.

It may be said of the other three boards -- those for broilers, turkeys and eggs -- that their supply management programs have been focused on stabilizing producer prices, and in this dimension the turkey and broiler boards at least have unquestionably had some success. Considerable variation has remained, however, in the other farm-level variables, output and revenue.

From the perspective of the consumer, retail prices of eggs and possibly of broilers have been more stable in Canada than in the United States, and retail price stability has increased for eggs since the national board came into existence. However, for broilers this stability has been around a rising price trend. Retail turkey prices appear to have been less stable than in the United States. Retail supplies of eggs and poultry meats to Canadian consumers from domestic sources have not been more stable than in the United States. With mixed results such as these, it is small wonder that consumers hesitate when it is suggested that they should favour producers' marketing boards because their practices conduce toward assured supplies of product at stable prices.

Part of the costs of stabilizing producers' prices for eggs and poultry meats have been borne by processors and traders through variations in the volume of product handled and inventory holdings. And, although not addressed in the analysis, it should be noted also that foreign producers too have been forced to bear a part of the cost of stabilizing the Canadian market by having their access restricted

and, in the case of eggs, by the diversion of supplies surplus to requirements at the stabilized price into their market. Thus, reducing fluctuations in the national market has entailed departure from a liberal trade policy.

Some may choose to interpret our results on the matter of stability as inconclusive. We believe this to be a highly significant and consequential finding. For we would argue that if marketing boards do not deliver stabilization benefits which are unequivocal, large and widely distributed, then, at a minimum, society should avoid over-valuing this aspect of the case for boards and their practices.

Indeed we would go further, and suggest that in the public policy debate about boards rather more attention should be paid to the malignant effects of their practices listed earlier and rather less to their stabilization effects, of which board advocates make so much. The trade-off between stabilization benefits that are "spotty", limited and uncertain at best, and at worst are illusory, and the demonstrable worsening of competitive efficiency and impairment of equity that are attributable to the supply management boards, does not strike one as being immediately favourable to Canadian society at large, or ultimately to Canadian farmers themselves.

Furthermore, part of the case for boards is that their stabilizing activities lead to increased efficiency in the use of resources throughout the food system. Notwithstanding the lack of support for this proposition provided by our initial analysis, it may be that they do indeed have such positive effects. What cannot be denied is that these effects are partially offset, and perhaps overwhelmed, by those features of the supply management boards which shift supply functions to the left, i.e. the

capitalization of economic rents into costs, under-utilization of capacity, and attenuation of the imperatives of continuous innovation and progress provided by the uncertainties of competitive markets. Thus the result may be the antithesis of the intent. In our judgement, Canadian experience points to the conclusion that the probability of this perversity rises with the reach of the powers accorded farmers to "stabilize" their markets.

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