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USEFULNESS AND LIMITATIONS OF COP ESTIMATES FOR EVALUATING INTERNATIONAL COMPETITIVENESS: A COMPARISON OF CANADIAN AND U.S. WHEAT

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With the current negotiations under the General Agreement on Tariffs and Trade (GATT), the potential exists for a reduction in agricultural subsidies and trade barriers. This has led to an increased emphasis on the part of the major exporters of agricultural commodities to understand their relative competitive position in a reformed international trading environment. In addition to the GATT, interest in competitiveness has been heightened in Canada and the U.S. by the recent bilateral reductions in trade barriers under the Canadian-U.S. Trade Agreement. A number of papers by agricultural economists have compared the cost of production of certain major North American crops with the costs of major competitors (Ortman, et al., Seecharan, Stanton). These comparisons have often been quoted in the popular press and by farm organizations as a means of illustrating the competitive position of North American farmers. However, there has been very little discussion among agricultural economists on the role of cost of production estimates in determining the international competitive position of exporting countries.

This paper examines the usefulness and limitations of cost of production estimates in the analysis of international competitiveness. First, the role of cost of production in the concept of competitiveness is discussed. The common uses for which cost of production estimates are constructed, the general implications of how those uses might affect estimation methods, and the elements of typical cost of production estimates are then discussed. Comparisons of wheat produced in Canada and the United States are used for illustration in the remainder of the paper. We begin the comparison by reviewing the structure of wheat production and the export positions of the two countries. Finally, we compare (1) approaches to estimating costs and (2) cost estimates for two regions and then draw conclusions regarding the usefulness of cost comparisons in the analysis of international competitiveness.

Wheat trade

COST OF PRODUCTION AND COMPETITIVENESS

There is no general economic theory of competitiveness because it is not strictly an economic term. However, the basic economic trade concept, comparative advantage, is a key element in competitiveness. A country is said to have a comparative advantage in producing a particular agriculture commodity if it has the highest return per unit of fixed resource. The implications of comparative advantage are that each country should produce those commodities for which it has a relatively abundant supply of fixed factors, such as land or labor. The industry marginal costs of production which underlie the industry supply curve, in addition to the costs of delivering the product to the market, then serve as the basis for measuring the comparative advantage concept.

There are two major reasons why cost of production estimates as they are commonly constructed and

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published by countries are not directly applicable in the analysis of competitiveness. First, the implications of comparative advantage concepts are only applicable under a certain set of assumptions; in this case, when international markets are well-functioning and undistorted by domestic policies. Because international agricultural markets are far from being undistorted, the cost and production relationships underlying comparative advantage are only one of the determinants of a country's competitive position. Domestic agricultural and nonagricultural policies have major impacts on competitiveness. But there are other factors which affect a country's competitive position, as well. These include: product quality, costs associated with adding value to the commodity, market niches, exchange rates, and perceived reliability as a trading partner.

The second reason why cost of production estimates as they are commonly reported are not very useful in the analysis of competitive position, is because they are reported as average costs, per acre or hectare or per unit of output, for a spatially-defined area. These estimates are the average of costs for firms of varying sizes and with varying technologies at one point in time, facing a single output price. As such, they represent the average of single points on each firm's average cost curve. These cost data contrast with the cost data underlying the industry supply curve, the relevant concept, which are the horizontal sum of each firm's marginal cost curve.

USES OF COST OF PRODUCTION ESTIMATES

Cost of production estimates are generally constructed with a single or multiple end-uses in mind which affect how they are measured. Use in analysis of international competitive positions is rarely one of the primary purposes for constructing the estimates. There are three common purposes of commodity cost estimates: as financial planning tools for producers, as policy and program instruments, and for economic analysis of production decisions.

Extension Guidelines. One of the most common uses of commodity cost of production (COP) estimates is as production guidelines published by university and provincial extension agencies. These guidelines are intended to be used by farm operators for planning their enterprise mix and their cash flow position for the coming production cycle. They are frequently referred to as "budgets" because of this forward-looking aspect. In addition, they are often times based on the assumption of best management practices and then viewed as goals to be achieved during the upcoming year. Accordingly, management practices are often formulated by production specialists and are not based on actual farm usage data.

Domestic Program Instruments. The U.S. has income and price support programs for wheat, feed grains (corn, sorghum, barley, oats) cotton, and rice. Under income support programs the government makes deficiency payments to eligible farmers and share landlords based on established target prices. Under price support programs the government offers eligible producers the right to place their commodities in a nonrecourse loan program with an established loan rate. Currently, cost of production estimates are not used directly to set income supports for any commodities. They are, however, used in the setting of price supports for sugar, tobacco, and peanuts. Under the current legislation, cost of production estimates are to be used to set loan rates and target prices for wheat if a wheat marketing quota is established. Since no such quota has been established, cost of production estimates have not been used to set wheat support levels.

In the past, cost of production estimates made by the U.S. Department of Agriculture's (USDA) Economic Research Service were used in setting U.S. target prices for wheat, corn, cotton, and rice under the 1977 Farm Bill. That provision was later removed with the 1981 and subsequent bills. Nevertheless, cost of production estimates are still reviewed and discussed in the political arena. Commodity interest groups show continued interest in the levels of the cost of production estimates because they believe that, even if they are not used by law to set target prices, policymakers likely use the estimates as guidelines for support levels.

By law, the USDA is mandated to produce estimates of the national weighted average of the costs of producing major commodities. This mandate directly influences the concept and estimation methods used to construct the USDA estimates. In particular, the policy use of the USDA estimates has led to efforts to provide cost estimates which are based on the actual, historical costs of a statistically representative group of the nation's producers. It has also meant that estimates are constructed which exclude the direct effects of commodity programs. Most importantly, this translates into excluding the returns from the programs on the gross returns side and valuing production shares paid to share rent landlords at market prices, rather than target prices, on the gross expense side. Eliminating the indirect effects of the programs on other components of costs and returns is virtually impossible.

In Canada, two major on-going programs have been used to stabilize the incomes of wheat producers: the Western Grain Stabilization Act (WGSA) for the Prairie region and the Agricultural Stabilization Act (ASA) for the other wheat regions. Under the WGSA, producers pay a premium to participate in the program. The WGSA guarantees net cash flow at 100 percent of the previous five-year average level. The net cash flow estimates are based on the whole-farm National Farm Survey undertaken by Statistics Canada. Individual producers participating in the program are able to enroll up to $60,000 worth of grain in the WGSA each year.

Under the ASA, all wheat producers are eligible for payments if a pay-out is triggered. The pay-out is triggered if wheat price is below 90 percent of the previous five-year average wheat price with adjustments based on changes in the cash cost of producing wheat. Although the Canadian government does not have an official program for estimating costs of production on an annual basis, cost of production data are collected when needed to administer the ASA program. In addition, several universities and provincial governments estimate the costs and returns associated with commodities of importance in their areas.

Economic Analysis. Although they are usually not constructed for the primary purpose of conducting purely economic inquiries, cost of production estimates are used in a variety of economic analyses. Of special interest in this paper is in evaluating comparative advantage and competitiveness, but other examples abound, for example, economies of size analysis. Estimates of long-run costs of production are generally the most useful for economic analysis. In particular, these estimates include a complete costing for all inputs, including owned inputs which are valued at an opportunity cost.

PROBLEMS IN COMPARING COST OF PRODUCTION ESTIMATES FROM MULTIPLE SOURCES

Ideally, commodity cost and return data that are being compared should be generated under identical procedures. This is rarely the case in practice if the estimates are not of the same source because commodity cost estimation is not a straightforward accounting operation, in contrast to whole-farm accounting. Operators generally do not keep their records on a commodity-by-commodity basis, and if they do, they are forced to make some simplifying assumptions about allocating some costs.

No matter what the purpose of comparison, secondary users of cost and returns estimates from multiple sources need to consider the variation in assumptions and approaches across sources. Much of the variation results from the different primary end uses described above. Other differences are simply the result of a value judgement on the part of an economist on how best to construct an estimate given production theory and the resource constraints. This is especially an issue for the imputed returns to owned inputs. Economic theory provides the guide that an opportunity cost should be measured, but a great deal of variation exists in the assumptions involved in specifying and then measuring the appropriate rate of return to inputs. Moreover, imputed costs are generally not a small component of total economic costs. The most straightforward costs to allocate among commodity enterprises are the cash variable costs. In 1988, cash variable costs among the major field crops varied from 30 to 60 percent of total economic costs (USDA, 1990). Furthermore, even some of the cash variable expenses, such as fuel, lube, and repairs, are based on the actual acres covered by specific machines as reported by operators, in conjunction with the use of some assumed engineering relationships. Klemme, Schoney, and Finner found through a comparison of farmers' estimates of the total time spent in machine use for all farm enterprises with the sum of estimated machine use as generated by typical cost of production estimation techniques that standard procedures underestimated machine use and, hence, machine-related costs.

The potential for variation in estimates from multiple sources due to differences in estimation methods, rather than actual cost levels, is too extensive to elaborate in this paper. However, a data user should consider the following set of questions regarding consistency in measurement approaches when comparing cost and return estimates from multiple sources: What cost concept is being measured, for example, a net cash flow or an economic cost? Are the underlying data representative of the population of interest? Are the estimates intended to be a reflection of actual costs or of best-management costs? Do the cost estimates include landlord as well as operator costs? How often are the production technology data collected--are they for the year in which comparisons are being made? How are the effects of Government policies treated? What portion of costs are out-of-pocket costs and what portion are imputed? What are the imputation procedures? Is a "budget-generator" used with implicit engineering relationships or are operators asked to allocate all their costs among the commodity enterprises? Is depreciation measured on a replacement basis or an historical basis? How are shared inputs of multioutput firms allocated, for example, machinery costs? How are cash fixed costs allocated, for example, interest charges? Are real or nominal interest rates used to impute returns to capital?

WHEAT PRODUCTION AND EXPORTS IN NORTH AMERICA

Wheat is an important crop for both the United States and Canada. In terms of value of crop receipts, it is the most important crop grown in Canada and the fourth most important crop grown in the United States. The 1986 Canadian Census of Agriculture reported that 119,718 farms produced wheat, representing 40.8 percent of all Census farms. Saskatchewan is the largest Canadian wheat producing province with 55,202 farms producing wheat. In the U.S., 352,237 farms produced wheat in 1987 according to the U.S. Census of Agriculture; these farms represented 17 percent of all U.S. farms. North Dakota, Kansas and Oklahoma are the top three wheat producing states and account for approximately 30 percent of U.S. production. Wheat-producing farms are more specialized in Canada than in the U.S. Specialized wheat farms (50 percent or more of farm sales from wheat) accounted for 18 percent of the farms producing wheat in the U.S. and 40 percent in Canada. Small farms with farm revenues of less than $50,000 account for approximately 50 percent of the farms growing wheat in both the U.S. and Canada, but only about one-quarter of the wheat acres. More than half of the wheat acres in each country, however, were on farms with revenue of between $50,000 and $250,000.

Compared to most other agricultural commodities, wheat is not a homogenous commodity. There are five major classes of wheat, each with different final uses which affect demand on the international market. Hard Red Spring Wheat (HRSW) is the dominant wheat crop grown in Canada, accounting for 77 percent of the Census acres in 1986. High protein wheats in the U.S. are less dominant than in Canada. In the U.S., HRSW accounts for approximately 20 percent of U.S. production and hard red winter wheat, with a somewhat lower protein level, accounts for about half of production. The U.S. also produces and exports wheat in the other three classes: soft red winter, white, and durum wheat.

The United States and Canada compete in the world market for sales of wheat with similar characteristics. In the U.S. over half of the wheat crop is exported, accounting for some 30-40 percent of the world wheat trade. Over three-quarters of the Canadian wheat crop is exported giving Canada a 15-20 percent share of the world wheat trade.

COMPARISON OF SASKATCHEWAN AND NORTHERN PLAINS

We will compare estimates on wheat production costs for two similar regions in the U.S. and Canada for 1987 and 1988 to illustrate the issues regarding comparability of approaches. We view this comparison as one based on as close to a consistent approach as an international trade analyst could realistically expect to find in today's agricultural data system. For this reason, and because environmental growing conditions are very similar, we would a priori expect cost estimates to be very similar.

The U.S. estimates are for all classes of wheat in the Northern Plains region which includes Minnesota, Montana, North Dakota, and South Dakota (USDA, 1990). The USDA estimates use three general approaches to estimating costs: wheat production costs are reported by the operator, wheat input quantities are reported by the operator and valued at a state average price, and input costs are estimated with a budget generator system. The budget generator system is used to estimate machinery-related costs and relies on operators' reports of actual machinery used and times over or hours of use in conjunction with established engineering relationships of machine efficiency (USDA, 1990). USDA collects data on production technology every four to five years and updates quantities of output and prices of inputs every year. The production technology underlying the estimates for 1987 and 1988 reported here are based on the 1986 wheat version of the Farm Costs and Returns Survey. The wheat survey is designed to be representative of all wheat production in the region and has a sample size of 255 farms which represent approximately 55,000 wheat-producing farms.

The Canadian estimates are based on Top Management Workshops data for Saskatchewan (Schoney). The Saskatchewan workshops require a high level of time input from participants and are not based on a representative sample of farms. Because large, possibly more efficient, farms are overrepresented in the sample, one might expect to find costs lower for Saskatchewan than those for the neighboring U.S. Northern Plains region whose costs are based on a representative sample of all wheat producers. However, it is unlikely that the lack of representativeness of the Saskatchewan sample would have a large impact on the average cost level because small farms account for a disproportionately small share of wheat acres and wheat production.[1] The Saskatchewan sample size was 78 farms for 1987 and 115 farms in 1988. The general procedures are similar to the USDA system with two exceptions: (1) complete data, including data on underlying production technologies, are available every year and (2) since cost data are collected on every enterprise on the farming operation, the system has a built in check to ensure that the sum of enterprise costs as estimated by standard procedures does not exceed the whole-farm costs.

The methods that are used to calculate the various cash cost items from the USDA and University of Saskatchewan are summarized in Table 1 and provided in detail in Schoney and USDA, 1990. The methods of calculating cash costs are generally very similar. Not surprisingly, methods to estimate fixed cash costs and imputations for owned inputs between the two systems do differ. For example, returns to nonoperating capital under the USDA system are based on a real rate of interest and are based on a nominal rate of interest under the University of Saskatchewan system.

Results and Discussion

The wheat cost and return estimates for Saskatchewan and the U.S. Northern Plains are reported in Table 2 for 1987 and 1988. In 1987, growing conditions were relatively normal, but both areas experienced a severe drought in 1988. The yields on average and total revenue (excluding government payments) were very similar in Saskatchewan and the U.S. Northern Plains.

In terms of variable cash expenses per acre, wheat production costs were also very similar. In 1987, variable cash costs in the U.S. Northern Plains were $36.23, compared to Saskatchewan's $33.43. Although the sum of variable cash costs were similar, significant differences exist for individual expense items. For example, chemical expenses are higher in Saskatchewan, whereas fertilizer expenses are higher in the Northern Plains. Because of the relative consistency in estimation methods between the two systems for these inputs, we can confidently assume cost differences are real and draw relevant conclusions. For example, policy reforms or new technologies which may affect chemical quantities applied and/or price would probably have relatively more impact on Saskatchewan producers than producers in the Northern Plains.

Fixed cash costs per acre were similar between the two regions in 1987, but much less so in 1988. The $2.54 difference widened to $4.76 in 1988. This can only be explained by the methods. USDA allocates fixed cash costs based on the proportion wheat value of production is to total value of production vs. the University of Saskatchewan's approach of allocating fixed cash costs based on the proportion cash variable wheat costs are of total farm cash variable costs. With the extreme drought conditions of 1988, total value of production was down and, moreover, wheat was more adversely affected than other commodities produced on farms in the region.

Estimates of capital replacement, and returns to operating and non-operating capital are all significantly different between the two regions in both years. However, so are the estimation methods used to calculate them. The important point for purposes of this paper is not how the procedures are different and which approach might be preferred, but that they are different and may, in fact, be responsible for the different levels of cost reported by the two sources. Methods for estimating costs of land are similar, however, and based on information on rental markets for wheat land. Again, we find that cost levels in the two regions are comparable when methods are similar.

Costs of production vary considerably across individual farms (Ahearn, et al.). The analysis of cost of production throughout the range of cost levels can be useful for analysis of competitive position in two ways. First, the assessment can provide an indication of various quantities which could be supplied at certain levels at least in a shorter run period. In the longer run, firms could be expected to adjust to relative price changes and the cost curve may have a different shape. Secondly, assessment of cost variability can be useful in identifying the reasons why certain producers are high cost producers and lead to the development of extension programs or policies to improve per unit of output cost levels. Of course, this type of analysis is fraught with the same limitations as are the average cost estimates if the underlying estimation methods are incomparable.

Figure 1 shows the cumulative probability distribution of wheat production costs per bushel in Saskatchewan and the U.S. Northern Plains. Two relevant observations can be made about cost distribution information. First, the distributions are quite similar except at the high cost end of the distribution. This is likely due to the low representation of small, generally high-cost producers who account for a small share of the production in the Saskatchewan sample. Secondly, the average economic cost of production for wheat in Saskatchewan was $4.31 (CAN) and the median was $4.19 (CAN). In 1988, with the severe drought conditions, the difference between the average and median was much greater. Average economic costs for Saskatchewan wheat were $8.51 (CAN) and the median was $6.41 (CAN). This illustrates the importance of analyzing the full range of cost estimates.

CONCLUSIONS

The purpose of this paper has been to explore the usefulness of cost of production estimates in the discussion of international competitiveness. Cost of production estimates can not be directly used to measure a country's competitive position. However, cost estimates are extremely useful and perhaps a country's leading indicator of competitiveness. In addition, this paper sought to establish that knowledge of the underlying estimation system is critical for evaluating whether comparative costs are real or a result of the estimation system. The most consistency in estimation methods was found to be in the estimation of cash variable costs. This is not surprising, given that these are also the costs that are most easily reported by farm operators.

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1 A comparison of farms participating in a similar, nonrepresentative farm-record keeping system in North Dakota to a representative sample of farms found that the characteristics of farms were significantly different between the two groups (Gustafson, C., et al.).

TABLE 1. Comparison Between USDA and University of Saskatchewan Methods of Calculation

CASH EXPENSES	USDA	UNIVERSITY OF SASKATCHEWAN
Seed	Multiplies farmer-reported seeding quantities by state average seed prices.	Multiplies farmer-reported seeding quantities and prices.
Fertilizer	Multiplies state average prices per pound of primary nutrients by farmer-reported pounds of nutrients applied.	Multiplies farmer-reported price of fertilizer by quantities applied per acre.
Chemicals	Producers report their chemical expenses for a particular crop.	Multiplies quantities of individual chemicals applied by farmer-reported price of the pesticide.
Custom Operations	Producers report custom operation expenses for a particular crop.	Same as USDA.
Fuel, lube, and electric	Producers report data on machine size, age, and acres covered. These data are combined with engineering specifications of speed and field efficiency to arrive at hours per acre. The hours per acre are multiplied by fuel consumption per hour and fuel price to determine fuel expense per acre. Lubrication costs are calculated at 15 percent of fuel expenses. Electricity for irrigation is estimated from farmers' reported equipment specifications and hours that water is pumped.	Same as USDA except for pick-up trucks, except a calibration procedure is used to ensure that individual commodity estimates for all commodities produced equals the whole-farm estimate. For pick-up trucks, costs are included as general overhead.
Repairs	A repair rate per machine is calculated based on engineering relationships for each machine which is divided by the number of hours the machine is used on a particular crop.	Same as USDA except for pick-up trucks, except a calibration procedure is used to ensure that individual commodity estimates for all commodities produced equals the whole-farm estimate. For pick-up trucks, costs are included as general overhead.
Hired Labor	First, total hours of both unpaid and paid labor are calculated. Hours of machine-related labor requirements are estimated based on reported field operations. Hours of hand labor requirements are estimated based on the type of irrigation system and the hours water is pumped plus the hours of other hand labor reported by farmers for other purposes. Total hours are then designated as paid or unpaid based on the proportion of labor paid a cash wage on all crop farms. Estimated paid hours are then multiplied by the state wage rate for farm labor to give the hired labor expense.	Hired labor expenses are the sum of paid machine-related labor hours and expenses for salaried labor. Hours of machine-related labor are calculated in a manner similar to the USDA procedure. Salaried labor expenses are allocated to the commodity based on the proportion cash variable expenses of the commodity are of all cash variable expenses. Salaries paid to spouses are excluded.
Technical Services, Other	Costs reported by farmers for such items as soil testing, scouting and land surveying.	Same as USDA, except it also includes crop insurance premiums.
General Farm Overhead	Farm overhead is the sum of non-crop specific activities, such as utilities and blanket insurance policies. Overhead costs are allocated to the commodity based on the proportion value of production of the commodity is of total farm value of production.	Overhead costs include items similar to the USDA. Overhead costs are allocated to the commodity based on the proportion cash variable expenses of the commodity are of all cash variable expenses.
Taxes and	Taxes equal the sum of personal	Real estate taxes paid are included, but all

Insurance	property tax for machinery plus real estate taxes. Insurance charges for machinery are also included.	insurance costs are included in general overhead.
Interest	Data on actual operating and real estate interest paid are collected annually and allocated to the commodity in a similar fashion to general farm overhead.	Interest expenses are the commodity's share of charges actually paid for operating, machinery, and real estate loans. Interest on operating loans are allocated to the commodity based on the proportion of cash variable expenses. Machinery and real estate interest expenses are allocated to the commodity based on the proportion of the value of the machinery and land used for the production of the commodity of the whole farm value of machinery and land.
Capital Replacement	Based on a per-hour rate that each piece of depreciable equipment is used and on the hours per acre that each is used in the production process. Hourly capital replacement is calculated based on the current purchase price less salvage value divided by the hours used.	Based on the nominal loss in value of machines, equipment, and buildings between the beginning and ending of the period.
Charge to operating capital	Calculated based on the product of the value of cash variable expenses and the time between their use and harvest as a proportion of a year and the average interest rate on 6-month Treasury bills.	Calculated as the product of cash variable expenses and a 6 percent interest rate.
Charge to Other Non-Land Capital	Calculated based on the product of the current value of machinery and equipment used for the commodity by the real rate of return to agricultural assets over the previous 10-year period.	Calculated as the product of the beginning investment value of machines, equipment and buildings and a nominal 12 percent rate of interest.
Net Land Return	The rental rate is a composite rate based on cash rental rates and the value of share rental agreements. The production under share agreements is valued at the market price. All land, whether owned or rented, is charged a return.	Calculated as a blended charge of cash rent paid, the value of share rents, and an imputed charge for owned land. The charge for owned land is equal to the beginning value of land times a 5 percent interest rate.
Unpaid labor	Calculated as the product of unpaid labor hours times the state average wage rate for hired labor. See hired labor for a description of how hours of unpaid labor are calculated.	Calculated as the product of unpaid hours and a wage rate of $7 (CAN). See hired labor for a description of how hours of unpaid labor are calculated.

Table 2-- Economic costs of producting wheat, Northern Plains and Saskatchewan, 1987-88 1/

ITEM	U.S. Northern Plains 1987	U.S. Northern Plains 1988	Saskatchewan 1987	Saskatchewan 1988
	($US/ACRE)			
Gross Value of Production				
Primary Crop	75.46	48.66	75.61	48.99
Secondary Crop	1.55	1.23		
Total	77.01	49.89	75.61	48.99
Cash Expenses				
Seed	5.82	6.38	4.05	3.39
Fertilizer	9.58	10.87	8.72	6.44
Chemicals	4.39	4.39	7.56	6.14
Custom Operations	3.54	3.18	0.40	0.33
Fuel, Lube & Electricity	5.10	4.47	4.74	3.71
Repairs	5.83	5.17	5.14	4.59
Hired Labor	1.93	1.72	0.03	0.09
Technical Services/Other	0.04	0.04	2.79	2.79
Total, Variable Cash Expense	36.23	36.22	33.43	27.48
General Farm Overhead	6.24	3.77	7.16	8.10
Taxes and Insurance	7.43	6.76	2.31	2.33
Interest on Operating Loans	3.37	1.98	3.42	2.91
Interest on Real Estate	7.69	3.76	9.30	7.69
Total, Fixed Cash Expenses	24.73	16.27	22.19	21.03
Total, Cash Expenses	60.96	52.49	55.62	48.51
Value of production less cash expense	16.05	-2.60	19.98	0.50
Capital Replacement Charge	21.79	19.74	13.77	11.04
Value of production less cash expense and capital replacement	-5.74	-22.34	-6.21	-10.54
Economic Costs:				
Variable Cash Expenses	36.23	36.22	33.43	27.46
General Farm Overhead	6.24	3.77	7.16	8.10
Taxes and Insurance	7.43	6.76	2.31	2.33
Capital Replacement	21.79	19.74	13.77	11.04
Allocated Charges to Owned Inputs:				
Charge to Operating Capital	0.61	0.74	4.85	3.00
Charge to Other Non-Land Capital	4.48	4.43	14.41	10.59
Net Land Return	28.10	24.77	23.69	21.25
Unpaid Labor	4.29	3.84	4.43	3.15
Total, Economic Costs	109.17	100.27	104.05	86.92
Residual Returns to Management and Risk	-32.16	-50.38	-28.45	-38.03
Price (dollars/bu.)	2.45	3.87	2.58	3.62
Yield (bu./planted acre)	30.8	12.6	29.3	13.5
Economic costs per bu.	3.54	7.98	3.55	6.44

1/ Excludes the direct effects of direct Government payment for the U.S. Canada/US exchange rate = 0.823 (1987) and 0.758 (1988).

Figure 1. Cumulative distribution of economic production costs for wheat