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Cost of Production: an Appropriate Guide for Setting Target Prices and Loan Rates?

Marshall A. Martin, assistant professor of agricultural economics

The U.S. Congress is now considering new farm legislation to replace the Agriculture and Consumer Protection Act of 1973. The cost of production has been suggested as a replacement for the formula approach which is currently being used to determine target prices.

A key issue in the current farm policy debate is the determination of the level of the target prices and loan rates. The final outcome of this debate could have a substantial influence on U.S. agricultural export opportunities, farm land values, grain storage programs, and Treasury costs.

The idea of guaranteeing producers their cost of production plus a "reasonable" profit has appeal to many farmers, consumers, and policy-makers. However, there are several subtle and significant economic implications of using the cost of production as a basis for establishing target prices and loan rates.

This publication analyzes some of the limitations and advantages of the proposed cost of production approach. Recognition of the limitations and advantages should assist policy-makers in the drafting of new farm legislation.

Cost of Production - Some Conceptual Considerations

A farmer can derive income from the factors of production (inputs) that he owns in one of two ways: (1) he can rent them to someone else or (2) he can use them himself. If he rents an input to someone else, his income is the price per unit rented out times the number of units rented out. If he uses his inputs, plus perhaps some that he rents in, his income is the difference between the amount he receives from the sale of the goods and services he produces and the amount he pays for any inputs he hires from someone else.

In deciding how to use his factors of production, each farmer must compare the expected return from renting out his inputs with the expected return from using them himself. It is here that a troublesome question arises. Why should the income from renting out his inputs differ from the income received if the farmer uses them himself?

If an input owned by one individual were a perfect substitute for the same input owned by another individual, there would be no difference in expected income. However, if the productivity of an owned input is different from that of the same input when it is hired from someone else, the difference is due to the "entrepreneurial capacity" of the individual who owns an input. This return to entrepreneurial capacity is often referred to as a residual income. The three principal residual income recipients in agriculture are land, management ability, and owner-operator and family labor.

This residual income issue creates a pricing problem when one tries to estimate the cost of production. One solution is to price all inputs owned by the farmer at

1/ Those who wish a more detailed discussion of the theoretical concepts presented here should see: Marshall A. Martin, Cost of Production: The Concept and Some Implications for Its Use in the Determination of Target Prices and Loan Rates, Station Bulletin No. 162, Department of Agricultural Economics, Agricultural Experiment Station, Purdue University, West Lafayette, Indiana, May 1977.
their respective opportunity (alternative use) costs. Thus, the farmer can view his owned inputs as being hired from himself at the price which they would earn in the corresponding factor market. Any additional return is the return to entrepreneurial capacity. While this approach may work well for inputs such as farm machinery which is relatively homogeneous and is frequently bought and sold, it becomes extremely difficult to do for inputs such as agricultural land, managerial ability, and owner-operator and family labor.

A further complicating factor is that the value of the return to the entrepreneurial capacity or residual income claimants is largely a function of events in the product market. Any economic event which increases the product price such as the expansion of export demand or an increase in support price levels, tends to increase the return to the residual income claimants. As this return is capitalized into the value of the residual income claimants, the prices of these inputs tend to rise. The greater the relative scarcity of a particular input, the greater will be the increase in the price of that particular input.

Since land, an important residual income claimant, is a relatively scarce agricultural input, any increase in the economic return allocated to land leads to an increase in land values. This is why the means by which land costs are incorporated into the cost of production and the resultant impact of target prices and loan rates on land values is one of the key issues under discussion in the current farm policy debate. Although less of a political issue, conceptually returns to management ability and owner-operator and family labor are two other types of residual income claimants which can be affected by product price levels.

Determination of "the" Cost of Production

Although the idea of basing the target price and/or loan rate for each major crop on "the" per unit cost of production is supported by some farmers, it is extremely difficult to determine one per unit cost of production for each crop. Production costs can be affected by climatic and agronomic factors, level of technology, farm size and managerial ability. Corn is selected to exemplify how these various factors influence production costs.

Based on recent USDA studies,2/ per acre and per bushel production costs for corn vary widely among the various production regions (Table 1). In 1976 the per acre cost of production for corn, excluding land cost, ranged from $208.64 in the Southwest to $133.31 in the Lake States and Corn Belt. The per bushel production costs, excluding land cost, were $2.13 and $1.57 for the Southeast and Midwest, respectively. Although the Southwest has the highest yield, the Lake States and Corn Belt region has the lowest per acre cost and the second highest yield of all regions in the U.S. giving it the lowest cost of production per bushel, excluding land costs.3/

As these cost data for corn suggest, the nonland cost of production can vary substantially from one geographic region to another. Regional differences in soil types and rainfall can affect the availability of moisture and land productivity. Consequently, yields and the per unit cost of production vary across regions.

These regional differences in yields are normally reflected in the regional land values. Since land is a residual income claimant, the lower its productivity, other things equal, the lower the return to land.

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3/ The Lake States and Corn Belt account for about three-fourths of the corn production in the U.S.
Table 1. Corn: preliminary production costs per planted acre and per bushel, by cost item, specified regions, 1976

<table>
<thead>
<tr>
<th>Cost item</th>
<th>North-east</th>
<th>Lake States &amp; Corn Belt</th>
<th>Northern Plains</th>
<th>Southeast</th>
<th>Southwest</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs per acre:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>$98.34</td>
<td>85.68</td>
<td>75.94</td>
<td>103.67</td>
<td>138.00</td>
<td>86.39</td>
</tr>
<tr>
<td>Machinery ownership costs</td>
<td>26.32</td>
<td>22.85</td>
<td>29.61</td>
<td>24.23</td>
<td>31.91</td>
<td>24.23</td>
</tr>
<tr>
<td>General farm overhead</td>
<td>9.53</td>
<td>9.20</td>
<td>8.78</td>
<td>7.92</td>
<td>15.91</td>
<td>9.04</td>
</tr>
<tr>
<td>Management</td>
<td>16.72</td>
<td>15.57</td>
<td>12.42</td>
<td>12.49</td>
<td>23.02</td>
<td>14.82</td>
</tr>
<tr>
<td>Total, excluding land</td>
<td>150.91</td>
<td>133.31</td>
<td>126.75</td>
<td>148.31</td>
<td>208.64</td>
<td>134.48</td>
</tr>
<tr>
<td>Land allocation:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current value 1/</td>
<td>36.02</td>
<td>96.89</td>
<td>64.77</td>
<td>44.40</td>
<td>97.72</td>
<td>84.11</td>
</tr>
<tr>
<td>Average acquisition value 2/</td>
<td>26.50</td>
<td>68.31</td>
<td>47.52</td>
<td>29.10</td>
<td>85.04</td>
<td>59.42</td>
</tr>
<tr>
<td>Cost per bushel:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total, excluding land</td>
<td>1.81</td>
<td>1.57</td>
<td>1.85</td>
<td>2.13</td>
<td>1.90</td>
<td>1.67</td>
</tr>
<tr>
<td>Total, including land:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current value</td>
<td>2.24</td>
<td>2.72</td>
<td>2.80</td>
<td>2.77</td>
<td>2.79</td>
<td>2.71</td>
</tr>
<tr>
<td>Average acquisition value</td>
<td>2.13</td>
<td>2.38</td>
<td>2.54</td>
<td>2.55</td>
<td>2.67</td>
<td>2.41</td>
</tr>
<tr>
<td>Yield per acre: (bushels)</td>
<td>83.5</td>
<td>84.6</td>
<td>68.5</td>
<td>69.4</td>
<td>110.0</td>
<td>80.5</td>
</tr>
</tbody>
</table>

1/ Based on prevailing tenure arrangements in 1974, reflecting actual combinations of cash rent, net share rent, and owner-operator land allocations. Preliminary 1976 values of owned cropland are used.

2/ The details in the preceding footnote apply with the exception that for owned land the average value of cropland at time of acquisition is used.


and the lower are land values. Those regions which have the highest yields also have the highest land values (Table 1). Note also in Table 1 the greater interregional variability in per bushel production costs excluding land versus per bushel production costs including land.

If production costs vary among regions, how then are farmers in the higher cost regions able to compete with those in the lower cost regions? Farmers in higher cost regions are able to compete since commodity prices tend to be higher in high cost regions, A high cost region is generally an importing region while a lower cost region is generally an exporting region. Differences in transportation costs and local supply and demand conditions lead to these regional differences in commodity prices. A higher commodity price in an importing region encourages production in that region even though per acre and per bushel production costs may be higher because of higher input prices (e.g., labor, fertilizer, and fuel) and/or lower per acre yields. Thus production can be economically viable in a particular region even
though the cost of production is higher in that region than in another.

The per bushel cost of production can also vary within as well as among regions as a result of diversity in the production technology which is employed. Biological technologies (e.g., new crop varieties) as well as chemical technologies (e.g., pesticides and fertilizer) tend to increase yield. If the yield per acre increases more rapidly than the cost of the technology, the per unit cost of production will fall.

The adoption of mechanical technologies is another means of reducing the per unit cost of production. As the cost per unit of output of a new technology falls relative to the cost per unit of output of the technology currently being used, farmers will substitute the new for the old.

The adoption of modern technology has facilitated the increase in the size of farms. The resulting increase in production efficiency has permitted a decrease in the per unit cost of production.

The management ability of individual farmers can be quite varied. It is not uncommon for two farmers who grow the same crop on similar soil types in a particular community to demonstrate very different management abilities. One may be very efficient and successful while the other may not. Consequently, the per acre and per bushel cost of production, excluding the return to entrepreneurial capacity, can vary because of a wide diversity in management skills among producers.

One means, although somewhat oversimplified, of illustrating how this diversity in management ability can affect the per unit cost of production can be shown with some recent estimates of production costs for corn for Indiana for 1977. It is assumed that the timeliness of planting, application of fertilizer and pesticides, and harvesting provide top managers with about a 10 per cent higher yield than above average managers and a 10 per cent lower yield for average managers (Table 2).

As one would expect, increases in yields owing to better management ability result in a decrease in the cost of production per bushel, excluding the return to entrepreneurial ability. Consequently, for a given product price, the return to management per unit of output is larger on the more efficiently managed farms.

In summary, although it is often assumed that the determination of the cost of production is rather simple and straightforward, such studies face conceptual and practical difficulties. One of the more difficult problems is the calculation of the returns to entrepreneurial capacity. Differences among regions and firms in climatic conditions, soil types, technology, farm size, and management ability result in differences in the cost of production for a given commodity. This results in differences among farms in the return allocated to the residual income claimants such as land, management skills, and owner-operator and family labor.

Since land is a relatively scarce factor of production, any increase in the economic rent allocated to land leads to an increase in land values. This is why the way land costs are incorporated into the cost of production as well as the level of target prices and loan rates are two of the key issues in the current farm policy debate.

The Agriculture and Consumer Protection Act of 1973

A unique feature of the Agriculture and Consumer Protection Act of 1973 is the introduction of the target price concept for major agricultural commodities. Target prices are the basis for calculating deficiency and disaster payments for producers. The fundamental purpose of the target price concept is to provide a basis for making income transfer payments to producers which vary inversely with the market price.

Deficiency payments are viewed as income supplements to producers. These payments are made to protect farmers from
Table 2. Estimated Indiana cost of production for corn for 1977 under three different levels of management

<table>
<thead>
<tr>
<th></th>
<th>Average management</th>
<th>Above average management</th>
<th>Top management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assumed Yield/Acre</td>
<td>100</td>
<td>110</td>
<td>125</td>
</tr>
<tr>
<td>Total direct cost/acre</td>
<td>77.60</td>
<td>78.60</td>
<td>80.10</td>
</tr>
<tr>
<td>Total indirect cost/acre excluding land cost</td>
<td>81.50</td>
<td>82.25</td>
<td>83.38</td>
</tr>
<tr>
<td>Total land cost/acre*</td>
<td>108.00</td>
<td>108.00</td>
<td>108.00</td>
</tr>
<tr>
<td>Total cost/acre</td>
<td>267.10</td>
<td>268.85</td>
<td>271.48</td>
</tr>
<tr>
<td>Total cost/acre excluding land cost</td>
<td>159.10</td>
<td>160.85</td>
<td>163.48</td>
</tr>
<tr>
<td>Cost/bushel</td>
<td>2.67</td>
<td>2.44</td>
<td>2.17</td>
</tr>
<tr>
<td>Cost/bushel excluding land cost</td>
<td>1.59</td>
<td>1.46</td>
<td>1.31</td>
</tr>
</tbody>
</table>

*Assumed land value is $1800 per acre at 6.0 per cent interest. Some farmers who purchased their land prior to 1976 may be willing to compute their land cost at a lower figure based on a lower purchase price and perhaps a lower mortgage interest rate. However, the increased land charges shown in the table represent the situation faced by a recent purchaser of land and by most cash rent tenants. Total land costs (interest on investment, plus taxes and maintenance charge) approximate cash rental rates for this quality land in Indiana.


short-run declines in product prices.

Disaster payments help protect producers against the impacts of a natural disaster. Disaster payments are made when natural disasters prevent normal planting operations or, after a crop is planted, cause a reduction in production to two-thirds of normal production. Normal production is determined by a specified acreage allotment\(^4\) and normal yield.

No deficiency payments are made if the market price is greater than or equal to the target price (Figure 1a). Farmers would sell their production in the "open" market at the market price \(P_M\).

Deficiency payments are made if the market price during the first 5 months of the year is less than the target price but greater than the loan rate (Figure 1b). The deficiency payment would be equal to the difference between the target price and the market price times the production from allotted acres \((P_T - P_M) \times Q_a\).

If the market price for the first 5 months of the marketing year is less than the target price and the loan rate, deficiency payments equal to the difference between the target price and the loan rate times the production from the allotted acres would be made \((P_T - P_L) \times Q_a\). Furthermore, producers

\(^4\) Farm acreage allotments are currently based on historical acreage. The national allotment is established annually by the Secretary of Agriculture. The national allotment is then apportioned to the states, counties, and individual producers.
Historic Document

would most likely elect to place all their production under a nonrecourse loan. If unredeemed, the total value received by the farmers would be the loan rate \( (P_L) \) times the total production \( (Q_b) \) plus the deficiency payment for the production grown on the allotted acres \( (P_T - P_L) \times Q_a \) (Figure 1c). Thus the loan rate \( (P_L) \) becomes the floor price for those farmers who participate in the government program. The floor price for non-participants is \( P_M \).

Under the Agriculture and Consumer Protection Act of 1973 target price adjustments for each crop are based on changes in a formula. This formula includes two primary components: a) the USDA Index of Prices Paid for Production items, including Interest, Taxes and Wage Rates and b) a 3-year moving average of yields for the crop under consideration.

The following example illustrates how the formula works. The Prices Paid Index increased from 620 in 1974 to 677 in 1975 (1910-14 = 100). The 3-year moving average yield for wheat decreased from 30.6 bushels per acre to 29.9 bushels per acre.

In 1975 the target price for wheat was $2.05 per bushel. Given the 9.2 per cent increase in the Prices Paid Index and the 2.3 per cent decrease in yields, the target price for 1976 is $2.29 per bushel, an increase of 11.5 per cent.

\[
P_{T(1976)} = 2.05 \left[ 1 + \left( \frac{677 - 620}{620} - \frac{29.9 - 30.6}{30.6} \right) \right]
\]

\[
= 2.05 \left[ 1 + (0.0920) - (0.0229) \right]
\]

\[
= 2.05 \times (1.1148)
\]

\[
= 2.29
\]

An increase in the Prices Paid Index leads to an increase in the target price for the next year. The legislation is interpreted to preclude reductions in the target price below the previous year's level if the yield increases more than the increase in the Prices Paid Index. However, the target price may fall as a result of a decline in the Prices Paid Index.

Unlike the loan rate, target prices apply only to the production on allotted acres and

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**Figure 1.** Target price and loan rate operation.
not to total production. Hence, the expected deficiency payment does not affect the allocation of resources in the short-run. However, if over time farmers build-up an expectation of receiving a deficiency payment, the benefits will be capitalized into the fixed factors of production which are owned by the entrepreneur, i.e., the residual income claimant issue becomes relevant. The price of those factors which are relatively scarce in supply, e.g., land, will tend to experience a price increase.

The deficiency payments are a cost which must be borne by taxpayers. The deficiency payment is a direct income transfer from taxpayers to farmers. A commodity which is under loan, however, can be sold on the market and thus the government can redeem part or all of its initial outlay.

Proposed Farm Legislation

New farm legislation is now being discussed in Congress. In addition to the Carter Administration’s proposal, the Senate has passed a farm bill and the House Agriculture Committee has approved a farm bill which is now being discussed on the floor of the House.

Secretary of Agriculture Bergland, in testimony before the Senate and House Committees on Agriculture in March 1977 recommended a 4-year farm program. Secretary Bergland proposed that a floor, related to market price as well as farmer costs, be placed under the market prices for grains, soybeans, and cotton to protect farm prices. To protect farm income, it was proposed that for the 1978 crop year the income support price level (target price) for all grains, oilseeds, and cotton be equal to the sum of direct costs of production, a return to management, and a return to land ownership equal to 1.5 per cent of the current value of land. In the years beyond 1978, the income support levels would be based on changes in direct costs and yields. Returns to management and land would not increase after 1978. Loan rates would be established by the Secretary of Agriculture at levels that would keep our commodities competitive in world and domestic markets. The administration also recommended that acreage allotments be eliminated and that income support payments be made on the basis of current or the prior year’s plantings.

On May 24, 1977 the Senate passed (69 to 18) a farm bill (S. 275). The provisions of this bill are essentially the same as those in the omnibus farm bill which was introduced by Senators Talmadge and Dole. Target prices and loan rates are slightly higher in the version of the bill which passed in the Senate (see Table 3). This farm bill is estimated to cost $3.9 billion per year.

This bill (S. 275) would extend farm legislation through the 1982 crop year. Target prices and loan rates would be based on the cost of production which would include charges for direct costs, a return to management, and land costs. The land charge would be based on an allocation of share rent, cash rent, and average acquisition values. The yields used to calculate the per unit costs for wheat, corn and cotton would be based on the most recent 5-year average. Loan rates would be set at not less than 85 per cent of the cost of production unless such a level would discourage the exportation of feed grains or result in excessive stocks. Target prices would be equal to 100 per cent of the cost of production. Allotments would be based on the current year’s plantings.

On May 16, 1977 the House Agriculture Committee approved (40 to 6) a farm bill (H.R. 7171). The committee approved (30 to 13) a food stamp bill on June 22, 1977. The two pieces of legislation were merged and reached the House floor in July. The expected cost of this bill is $2.3 billion per year which is only $300 million above what the Carter Administration requested.

The duration of the House bill would be 4 years. The target prices and loan rates in the proposed House bill (H.R. 7171) are generally lower than those approved by the Senate but higher than those requested by the
Table 3. Target prices and minimum loan rates for 1978 crops

<table>
<thead>
<tr>
<th>Item</th>
<th>1973 Act</th>
<th>Senate S. 275</th>
<th>House H.R. 7171</th>
<th>Administration's proposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat ($/bu.)</td>
<td>2.58 1/</td>
<td>3.10</td>
<td>3.00</td>
<td>2.60</td>
</tr>
<tr>
<td>Corn ($/bu.)</td>
<td>1.70 1/</td>
<td>2.28</td>
<td>2.10</td>
<td>1.75</td>
</tr>
<tr>
<td>Cotton ($/lb.)</td>
<td>49</td>
<td>51.1 1/</td>
<td>56 2/</td>
<td>47.5</td>
</tr>
<tr>
<td>Soybeans ($/bu.)</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
</tbody>
</table>

**Loan Rates**

<table>
<thead>
<tr>
<th>Item</th>
<th>1973 Act</th>
<th>Senate S. 275</th>
<th>House H.R. 7171</th>
<th>Administration's proposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat ($/bu.)</td>
<td>1.37</td>
<td>2.47</td>
<td>2.35</td>
<td>2.25</td>
</tr>
<tr>
<td>Corn ($/bu.)</td>
<td>1.10</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
</tr>
<tr>
<td>Cotton ($/lb.)</td>
<td>44 1/</td>
<td>51 2/</td>
<td>51 2/</td>
<td>51</td>
</tr>
<tr>
<td>Soybeans ($/bu.)</td>
<td>2.25</td>
<td>4.00</td>
<td>3/</td>
<td>4.00 6/</td>
</tr>
</tbody>
</table>

1/ Estimated.
2/ Projected.
3/ Set by Secretary of Agriculture.
6/ Set by Secretary of Agriculture, after taking into account world supply/demand situation for grains and oilseeds.


Carter Administration (see Table 3).

Target prices, except for cotton, would be based on a 2-year moving average of the cost of production which includes variable, machinery, and overhead costs. A return to land and management would not be included. The target price for cotton would be 10 percent above the loan rate. The loan rate for all commodities, except cotton, would be at the discretion of the Secretary of Agriculture, but not less than the minimum set for the 1978 crop year. Acreage allotments would be based on the acreage planted for harvest in the current crop year.

All the proposals for new farm legislation suggest that the cost of production should be used as a basis for establishing target prices; and in the case of the Senate bill, loan rates as well. While the level at which target prices and loan rates would be set relative to the cost of production varies among the different proposals (Table 3), the variation is now less than it was among the various bills which were introduced earlier this year.

Linking Target Prices and Loan Rates to the Cost of Production

Once policy-makers decide that the cost of production should be used to establish target prices, and perhaps loan rates, for each crop, they face the following question: At what level will the target prices and loan
rates be set relative to the cost of production?

One of the more troublesome economic and political questions in setting support prices based on the cost of production is related to the owned inputs which are residual income claimants. The three primary owned inputs which must be considered are land, operator and family labor, and managerial ability. The level selected for the support price can have a major impact on the return to the owned inputs.

One level suggested for a target price is to equate it to the direct or variable costs. If market prices should fall to the support level, this would assure continued production in the short-run but would not guarantee a return to land, management ability, and owner-operator and family labor. And if this continued for very long, the value of land would fall and operator labor and management resources would tend to shift into other endeavors.

If the level of support covers both variable and fixed costs, the owned inputs would be guaranteed a minimum return. This guarantee return would most likely be bid into the price of the input leading to an increase in the cost of production followed by an increase in the target price. The result would be an input price spiral.

Land is the input which is extremely susceptible to this type of input price spiral. If farmers expect an increase in the price they would receive from future crop sales, they would be willing to pay more for cropland. This would provide a windfall profit to those who sell land. However, it would make it more difficult for non-landowning farmers to acquire land.

Target prices could encourage an increase in land prices even if no deficiency payments are made. By setting a target price, uncertainty is reduced and farmers' earnings expectations are increased. This could encourage farmers to buy land and bid up its price.

Another way to link the target price to the cost of production is to set the target price equal to all nonland production costs plus a fixed return to land. Land values would increase, but the impact would be once and for all, since the land charge would remain constant in the target price formula. This is essentially what Secretary of Agriculture Bergland has suggested in the Administration's proposal. For the 1978 crop year target prices for all major commodities would cover variable costs, machinery ownership costs, overhead costs, a return to management, and a return to land ownership equivalent to 1.5 per cent of current land prices. Changes in the target prices after 1978 would only be adjusted by changes in variable, machinery, and overhead costs, and yields.

The cost spiral problem could also arise if the loan rates are directly linked to the cost of production. However, the impacts on the owned factors are somewhat different in the case of target prices than they are in the case of the loan rates. Deficiency payments can only be made on production from allotted acres. Hence, the target price would be capitalized directly into the value of the cropland which has an allotment. Since the loan rate applies to all production, earnings provided by the loan rate would get capitalized into all the farm operator's fixed resources, land, labor, and management.

If target prices and loan rates are "too" high, resources would be misallocated, i.e., a crop would be grown in a particular region or on a farm which does not have a comparative advantage in that crop. One means of evaluating the impact of different levels of target prices and loan rates is to compare the rates of return for the various inputs, particularly the residual income claimants.

Product price distortions can also cause the selection of technology to deviate from the more appropriate long run path. Farmers, given price and income guarantees, may invest in irrigation facilities or buy larger tractors when such technologies would not
otherwise be advisable.

One of the primary policy dilemmas, if the cost of production approach is used, is the selection of the appropriate charge for land. If land is being rented on a cash basis, then the cash rent would be the relevant cost for the use of the land input. Although cash rent may be a good indicator of the opportunity (alternative use) cost of land, it is often difficult to ascertain in those regions where tenant share leases are used or where most land is owned and very little is cash rented.

If land has been recently purchased by a farmer, then the price paid for the land should reflect the current market value of land. However, the current market price may not accurately reflect the agricultural production value of land. It frequently includes a speculative demand component. This is especially true in a period of rapid inflation. If land were purchased in the past, then the acquisition value would more adequately reflect the out-of-pocket cost of the land.

If either a current cash rent or current land value is used to compute the cost of production and set support price levels, then those farmers who are able to rent land more cheaply or who purchased their land in the past at lower prices and interest rates would tend to be guaranteed a profit that they might not otherwise receive. On the other hand, farmers who are paying high cash rents or who purchased land at current land prices may face a serious cash flow problem if market prices were to fall to support price levels which are based on average land acquisition values. Thus policy-makers, as they select the appropriate land charge to incorporate into the cost of production calculations upon which target prices and loan rates are based, are faced with a tradeoff between helping landowners who have high land costs and potential cash flow problems versus providing low cost landowners with windfall profits and possibly encouraging an upward land price spiral.

Cost of Production versus Long-Run Market Prices

The cost of production is based entirely on product supply considerations. It does not take into account product demand conditions.

The market price for a product is determined by both supply and demand. Thus, if the target price and loan rate are based only on the cost of production irrespective of the demand conditions, they may be out of line with the long-run market equilibrium price.

Deviations between the support price and the long-run equilibrium market price can lead to serious economic and political problems. If the world market price is less than the loan rate, then export sales could be lost. This would adversely affect the balance of trade. In the absence of restrictions on production and some type of acreage diversion payments, farm income would decline because of the loss of export sales unless the U.S. government is willing to subsidize export sales and/or acquire the excess production through some type of Commodity Credit Corporation activity.

If the loan rate is to be kept above the long-run equilibrium price for any sustained period of time, acreage allotments would be required. This would be necessary to avoid burgeoning surplus stocks and large Treasury costs. This, of course, was a troublesome economic and political problem in the 1950s and 1960s.

Closing Comments

Even though economists know that the determination of production costs is both conceptually and practically a formidable task which is fraught with many dangers, it appears very likely that Congress will decide to use the cost of production as a means to establish target prices and perhaps loan rates. Recognition of the limitations as well as advantage of using the cost of production as a basis for setting target prices and loan
rates should enable policy-makers to enact more appropriate farm legislation. Obviously the final outcome will involve compromises among diverse special interest groups, tradeoffs among economic efficiency and economic equity goals, and administrative feasibility considerations.

The cost of production concept does overcome some of the limitations of the formula approach contained in the Agriculture and Consumer Protection Act of 1973. The cost of production approach is commodity specific and thus can potentially more adequately reflect technological change and the changes in the costs of those specific inputs which are used to produce a particular commodity.

Actual production costs are difficult to measure. They vary across geographical regions as well as among farmers. Rather extensive surveys are required to adequately assess these differences in production costs.

The determination of the appropriate land charge to include in the cost of production is also a difficult policy issue. If it is set high enough to help landowners who have purchased land at current, high land prices avoid cash flow problems if market prices were to fall to the income support level, the lower cost landowner would reap a windfall profit. Moreover, a land price spiral could occur.

Once the cost of production for a particular crop is determined, it still must be linked to the target price and loan rate. The level of the target price and loan rate can affect not only returns to the factors of production, especially the residual income claimants, but also the cost to taxpayers and consumers. If target prices and loan rates are "too high" relative to the long-run equilibrium or world prices, U.S. agricultural exports are affected. Moreover, if high target prices and loan rates were to be maintained, government storage programs and acreage allotment schemes would be required.

REFERENCES


Martin, Marshall A., Cost of Production: The Concept and Some Implications for Its Use in the Determination of Target Prices and Loan Rates, Station Bulletin No. 162, Department of Agricultural Economics, Agricultural Experiment Station, Purdue University, May 1977.

Penn, J. B., and W. H. Brown, "Target Price and Loan Rate Concepts for Agri-


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