



Risk and Resilience in Agriculture

Partial Budgeting

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Introduction

In recent years, farm and ranch management has become more difficult and challenging as a result of rapidly changing production and economic conditions. How do farm or ranch managers deal with these confusing factors? Who or what is available to help them decide the most profitable course of action?

One of the most helpful practices a manager can adopt is to plan for the future, particularly an uncertain one.

Even a poor plan is better than no plan when heading into a new operating season.

Planning includes taking an inventory of resources, devising alternate uses for these resources, estimating costs and returns associated with the alternate uses of these resources, and choosing the best alternative.

Budgets help the manager to organize financial and physical planning. By employing budgeting principles, a manager can compare costs and returns of alternative plans of action

for a farm or ranch business. Ideally, a manager should be able to choose a course of action that most nearly matches long-range goals.

Types of Budgeting

Several basic budgets are available to managers in the decision making process. Each budget is specific in its application, but each uses the same principles. The main budgets are:

- Whole-farm or ranch plan and budget,
- Enterprise budget,
- Partial budget, and
- Cash flow budget

Another budget is the family living expenditure budget.

The **whole-farm** or ranch budget is a detailed listing of resources of the entire business, along with a plan to use these resources to

achieve long-term goals. The whole-farm or ranch budget sets the direction the business will take and helps the manager achieve long-term goals.

The **enterprise budget** is a physical and financial plan for a specific crop or livestock enterprise. The enterprise budget estimates expense and receipts for a specified period of time using a specified set of production practices. Colorado State University has developed representative enterprise budgets for the major crop and livestock enterprises in the state. These budgets are available to producers and can be used as a basis of major budgeting and planning procedures.

The third budget, the **partial budget**, helps the manager evaluate the economic effect of minor adjustments in some portion of the business. Many aspects of business are fixed, in the short run. Partial budget can evaluate changes in resource uses that are not fixed.

The fourth budget, the **cash flow** budget, helps establish the cash needs of the business over a specified planning period, usually a year. Further, the cash flow budget helps plan repayment of existing loan obligations, determine repayment capacity or ability to repay new operating loans or longer-term loans, and establish the cash feasibility of a major capital purchase.

Principles of Partial Budgeting

Many changes that do not require a complete reorganization are possible on a farm or ranch. Given a fixed set of resources, the manager can employ these resources in more than one way in response to changes in product price levels, cropping patterns or carrying capacity. Partial budgets are useful to evaluate changes such as:

- expanding an enterprise,
- alternative enterprises,

- different production practices,
- hiring a custom operation rather than purchasing equipment,
- making a capital improvement, and
- buying a new machine to replace hand labor or an older machine.

Partial budgeting is based on the principle that a small change in the organization of a farm or ranch business will have one or more of the following effects:

1. Eliminate or reduce some costs.
2. Eliminate or reduce some returns.
3. Cause additional costs to be incurred.
4. Cause additional returns to be received.

The net effect will be the sum of positive economic effects minus the sum of negative economic effects.

Components of the Partial Budget

The typical partial budget usually consists of a seven-point plan. The seven components are additional costs, reduced returns, reduced costs, additional returns, totals of the first two and the second two, and a net difference. Table 1 shows the basic form of the typical partial budget.

Each of the cost and return categories is used to estimate the effects of a proposed change in business organization. Column I estimates the negative economic effects that result from the proposed change. Additional costs are those that occur if the change takes place. However, this doesn't include costs common to the present and proposed business organization (i.e., any cost that does not change should not be included in the partial budget). Reduced returns are returns that are not received under the proposed change. The total of additional costs and reduced returns is an estimate of the total negative economic effects of making the proposed change.

Table 1. Partial Budget Form

Column 1	Column 2
Additional cost _____	Additional returns _____
Reduced returns _____	Reduced costs _____
A. Total additional costs and reduced returns _____	B. Total additional returns and reduced costs _____
Net change in income (B minus A) _____	

Column 2 estimates the positive economic effects of the proposed change. Additional returns are added receipts that are received if the alternative plan is adopted. Reduced costs are those that are no longer incurred if the change in organization is initiated. Additional returns and reduced costs are totaled at the bottom of column 2.

The difference between positive and negative economic effects is an estimate of the net effect of making the proposed change. A positive difference indicates the potential increase in net returns if the change is made. Conversely, a negative difference is an estimate of the reduction in net returns if the change is adopted.

Mechanics of Partial Budgeting

When reasonable alternate plans are identified, the most important step begins. The success of the partial budget depends on prediction accuracy, which depends on the accuracy of the information and estimates it contains. The manager needs to collect factual data about the proposed change and provide reasonable estimates of such items as future prices, yields, and gains. Factual information include current costs of the factors of production, costs of capital, current

commodity prices, or other items pertinent to the particular decision.

It is difficult to generate estimates for future unknowns, particularly prices. The manager must estimate yields and prices to get an idea of what returns will or will not be received. Yield estimates can be obtained from several sources. The best source is individual production records that show the historical production level. This, combined with an assessment of current crop conditions, should closely predict future yields, given normal weather and other conditions. Other sources of yield estimates are neighboring farm or ranch histories, Colorado State University research reports showing average production, *Colorado Agricultural Statistics*, published by Colorado Agricultural Statistics Service, and the manager's past experience. A combination of these sources should provide a close estimate of projected production.

Future product prices are more difficult to predict. Agricultural economists, USDA statisticians, and future markets provide information about the trend of prices, national crop and range conditions and national production estimates. However, it will be unusual to find a predicted price for a product on a particular day. Information published by

the above sources, and a manager's intuition, will provide a good estimate of future prices for products.

Perhaps a more revealing approach is to use a range of prices (low, medium and high) to evaluate changes. This method will evaluate the price sensitivity of the projected change.

The partial budget is ready to be developed after all pertinent data is assembled. The amount of dollar cost that will result from making the proposed change is calculated for each of the categories. Again, only the costs and returns that change by proceeding with the alternate plan should be included in the partial budget. The unit used to analyze the change may be any size (depending on the change): the whole crop, one acre of the crop, one head of cattle or the entire herd. After the analysis is performed, the result should be multiplied as necessary to show the economic impact on the entire enterprise or business. The column totals show, respectively, the negative and positive economic aspects of the proposed change. Subtract the first column total from the second column total to obtain a net amount that reflects the change in net income if the proposed alternative is adopted.

A note of caution: the value of the analysis using partial budgeting is only as accurate as the input data- A positive net change says it would be economically wise to proceed with the alternate plan. A negative amount implies that it would not be economically profitable to proceed with the change.

Example -Machinery for Harvest: Rent vs. Custom

Table 2 uses partial budgeting to illustrate how to estimate the economic impact of leasing and operating a self-propelled combine to harvest 500 acres of dryland wheat currently harvested by custom operators.

The prices and rates used in this example may not be applicable to all areas, but the procedure is the same. The budget was prepared using the following assumptions.

- Custom combining rate for dryland wheat is \$12.00/acre
- Combine lease rate \$42.00/hour
- Combine accomplishment rate 7 acres/hour
- Fuel cost (diesel) \$0.95/gallon and 10 gallons per hour
- Labor rate \$5.00/hour

Additional costs. Included in this category are the operating costs of renting the combine., including fuel and oil, rent and labor. Repairs are paid by the leasing firm.

Reduced returns. In this example, there are no reduced returns because only harvesting costs are compared and the return is assumed identical, regardless of the harvesting method. However, there are two elements that might be included in this analysis, but are difficult to value in dollar terms: timeliness of harvest and reduced field losses. First, an operator may be ready to begin harvest, but if he or she depends on custom operators -the operator may have to wait Second, the operator may be more careful and skillful during harvest and save a greater percentage of the grain produced. These elements may be important, but are not included in the economic analysis because their dollar values would vary from farm to farm.

Budget summary The total of column 1 is \$4,180 per year. This is the cost of leasing the combine and operating it for one harvest. The column 2 total is \$6,000. This is the cost of custom combining that would not be incurred. The net difference subtracting column 1 from column 2, is a +\$1,820 savings to the operator from renting a combine as compared to having the wheat crop harvested by a custom operator.

Table 2. Partial Budget Example

Situation- Rent a combine for harvesting 500 acres of wheat per year versus custom hire.

Additional costs:		Additional returns:	
Operating costs		Extra yield	
Rent	\$3000	Timeliness factor	
Fuel and oil	680		
Labor	500		
Reduced returns		Reduced costs	
None	0	Custom combining:	\$6,000
500 acres @ \$12/acre			
A. Total additional costs		B. Total additional returns	
and reduced returns	\$4,180	and reduced costs	\$6,000
Net change in income (B minus A)	\$1,820		

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