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AGRIBUSINESS MANAGEMENT

FIGURE THE ODDS

One would not expect that the occupations of gambling and agribusiness management would ever be discussed simultaneously. Yet gambling and sound business management are, in no small way, interrelated. The professional gambler never places a bet until after he has figured the odds. The professional manager should also take time to figure the odds before committing himself to a specific course of action. As a manager, you may find it necessary to make several decisions each day. An error in your judgment could prove very costly. Several decades ago, many management decisions were based solely on intuition. At that time, intuition was really about all the manager could rely on. Nevertheless, wrong decisions were many and business mortality was high. Today, intuition plays only a minor role in decision making. The manager now renders a major decision only after he has carefully analyzed all available data, i.e., he always figures the odds.

Every gambler knows that there never exists a "sure thing." Even with 100 to 1 odds in his favor, over time the gambler is still subject to a major upset. And so it is with the manager of an agribusiness firm. Figuring the odds will not eliminate wrong decisions, it will only reduce their incidence and consequence.

Before proceeding into a discussion of how one figures the odds, an important distinguishing factor between gambling and management must be noted. In most common forms of gambling, the participant is faced with a singular win-loss outcome possibility. For example, in poker, craps, and dog racing, the bet is settled with a singular win-loss finality. Either you hold the winning hand or you don't; you highroll your opponent or you don't; your dog finishes or he doesn't. Management is not confronted with this singular win-loss outcome possibility. In fact, there exists an infinite number of possible win-loss gradients. For example, you may decide to construct a new warehouse based on the expectation that it will contribute $100,000 in net profit to your business. Once constructed, you may find that the warehouse is contributing to net profit only $50,000, $10,000 or $2,000. Worse yet, you may discover that the gamble was a poor one and the warehouse was actually reducing net profit by $10,000, $20,000, or even $100,000. As a result of this multiple win-loss outcome possibility, figuring the odds in business is substantially more complex than basic gambling theory. While it is complex, it is not impossible however, and the remainder of this paper is devoted to a description of how one figures the odds in business. Three distinct methods of figuring the odds will be discussed: 1) risk analysis, 2) sensitivity analysis, and 3) probability analysis. A realistic business situation will be applied to each of the three methods in an attempt to simplify its understanding.

Risk Analysis

As the title of this method suggests, risk analysis is an analytic procedure whereby management incorporates into its decision making processes some recognition of the risks involved. Suppose your firm's research division has developed five new products. Each of the five products has been test marketed and its prospect

appears promising. Your analysis of production costs, and retail sales price shows an earning potential and growth rate at the end of a five-year period which warrants the market introduction of all five products. However, as an astute manager, you are aware that unforeseen circumstances often arise with new product introductions. Many new products develop faults when commercially marketed that were not discovered in the test markets. For example, competition may reduce actual sales volume to a point well below that anticipated. Labor difficulties in your production facility may raise costs to such an extent that the new product is no longer profitable. These and many other unexpected occurrences do arise, and history has shown that 60 percent of new products commercially marketed fail to generate a profit level adequate to maintain continued production and distribution.

In figuring the odds, management recognizes that only two of the five new products are likely to succeed as expected, while the other three will be lost. Moreover, management has no way of determining which of the five products will be subject to the greatest consumer demand. Risk analysis dictates that a 60 percent discount factor be applied to the projected revenue generation of the combined five-product introduction. If after this discount, the expected five-product revenue continues to exceed relevant costs, the decision to introduce the products should be made. Note, however, that the 60 percent discount should not be applied to the projected revenue of each of the five products separately. If this were done, and the per unit cost-revenue expectations differed for each product, management might choose to introduce only those products which show the most promising discounted profit potential. Such a decision would be unfortunate since management really has no way of determining which three of the five products will ultimately fail. Hence, the introduction of only those products with a promising discounted profit potential would be to accept a 60 percent chance of a total loss.

Sensitivity Analysis

Some types of investment opportunities lend themselves to the preparation of projected future cash flows, e.g., the replacement of an obsolete machine or the addition of a new warehouse are normally accompanied by an engineer's estimates of construction costs, capacities, operating costs, etc., from which expected cost savings can be derived. When this occurs, management may prepare a projection of future cash flows to determine whether, on a discounted cash flow basis, the rate of return exceeds or falls short of its investment minimum. It is at this point that sensitivity analysis becomes useful to management's analysis.

Sensitivity analysis merely consists of changing several of the assumptions contained in the cash flow projection, one at a time, and then observing the impact of such a change on net cash flow. Suppose, for example, your firm was considering the possibility of building a new retail outlet in an area never before served by your organization. Based on a detailed market study and a specific set of assumptions, it was determined that the new outlet would generate a net cash flow of $150,000 per year. The set of assumptions included a retail product price of $2.50 per unit, an annual sales volume of 100,000 units, an employee wage rate of $3.50 per hour, an annual real estate tax of $2,000 and many other pertinent items. Sensitivity analysis requires that cash flow be determined for varying levels of product price while holding the other assumptions fixed. Then vary the sales volume, holding other assumptions constant, and observe its impact on cash flow. Ultimately, management will develop an understanding as to how sensitive the outlet's cash flow is to those factors which are important to its success. Suppose management were to discover that a 10 percent drop in sales volume would reduce cash flow to a level such that the rate of return fell below its investment minimum. If, under these conditions, management was not very confident of its 100,000 unit

sales estimate, it may wisely decide not to construct the new outlet. Again, management's ability to figure the odds could probably avoid a catastrophic decision.

Probability Analysis

Under sensitivity analysis, management compares its confidence in each basic assumption underlying its cash flow projection with variation in that cash flow as caused by possible inaccuracies in the underlying assumptions. Probability analysis differs little from this procedure except that a "likelihood" is assigned to each value of an assumption. Hence in our previous example, management might have determined that a sales volume of 100,000 units would likely be realized five out of every ten years, 75,000 units would likely be sold three out of every ten years, and 120,000 units would likely be sold two out of every ten years. By converting these likelihood's to percentage probabilities (i.e., 50, 30 and 20 percent, respectively), multiplying the resultant cash flows by these probabilities, and adding the products of these multiplications, management is able to derive a cash flow projection that accurately reflects the weighted average of the sales volume assumption. This same procedure is then used to obtain a weighted average cash flow on variations of the other basic assumptions. When the resultant weighted average are themselves, arithmetically averaged, the final expected cash flow reflects the real importance of the basic assumptions much more accurately than any single projection.

The calculations described above are not really as complex or as time consuming as they may first appear. One must recognize, however, that the adaptability of this procedure is directly related to the frequency of the decision, i.e., the greater frequency enhances the validity of management's likelihood probabilities. Figuring the odds in this manner should not frighten the conscientious manager who wishes to maximize his winnings. To prove this point, the remainder of this paper is devoted to four illustrative uses of probability analysis: 1) standby decisions, 2) pricing decisions, 3) credit decisions, and 4) salary decisions. In all four illustrations, it should be noted that costs, probabilities and other relevant data are assumed to be readily available to the manager. In the real world, of course, these data may not be readily available and management may have to substitute estimates for facts. Nevertheless, it can be shown that estimating these data and then proceeding through the prescribed calculations will produce decisions that are substantially more accurate than those resulting from management intuition. Professional gamblers already know this. You too, must learn to figure the odds.

Standby Decision Illustration: Suppose that in order to meet your firm's distribution requirement, a three-shift fleet of 20 delivery trucks is being operated. Unfortunately, you have found that because of driver absenteeism, the delivery fleet is operating at less than full capacity and deliveries have fallen short of production. An operational bottle-neck has, thereby, occurred. Union rules prevent you from asking a plant employee to drive a delivery truck when a regular driver fails to show for work. Hence you are considering the possibility of hiring a standby driver. How will this decision affect your net profit? Unless you stop and figure the odds, you really have no way to answer this question.

First gather the relevant facts, i.e., absentee records, driver productivity, and product gross margin (selling price less variable production costs). Absentee records show that on the first shift there was no absenteeism on 35 percent of the work days, one absence on 30 percent of the days, and two or more absences on 35 percent of the days. A driver could deliver product valued at $250 (selling price) having a gross margin of 20 percent. Drivers were paid $4 per hour for an eight-hour shift. Now let's figure the odds.

The loss in gross margin (after direct labor cost) due to an idle delivery truck is $250 x

20%, or $50 per shift. The labor cost of hiring a standby driver would be $4 x 8 or $32. The standby driver would be useful 65 percent of the time and, thereby, add the gross margin an average of $50 x 65% or $32.50. On the remaining 35 percent of the days, he would cost $32, or an average of $11.20 (35% x $32). Based on these odds, hiring a standby driver would add to gross margin an average of $21.30 ($32.50-$11.20). Now on your own time, follow this same procedure to determine if it would pay to hire a second standby driver. What if absenteeism for the 2nd and 3rd shifts were higher?

Pricing Decision Illustration: Suppose your agribusiness firm is engaged exclusively in the custom harvesting business. The lower your quoted custom charge, the greater are the chances of your getting the job. But, of course, if you succeed in getting the job due to the lower bid, your profit will also suffer an adverse effect. Having been in the business for several years, you have accumulated a record of successful and unsuccessful custom bids. Because of the availability of these data, you are able to figure the odds and decide on an optimum bidding strategy. Your objective is to estimate the chances of success of a quote that is a certain percentage above variable costs, i.e., any custom quote must always exceed your variable costs or the job is not worth bidding for.

Your historical records show that within the current competitive environment, custom quotes 20 percent above your variable costs were accepted 90 percent of the time; those 30 percent over variable costs succeeded 75 percent of the time; and those 40 percent over variable costs were only accepted half of the time. Your variable costs per acre (the basis for the quote) are $10. Hence, if you quote a custom charge of $12 per acre, the job will contribute $2 to overhead and profit, and be accepted 9 times out of 10. By weighing each quote's contribution to profit and overhead by the probability of acceptance, management will soon discover that a custom charge of $13 per acre would be optimal, i.e., $2 x .90 = $1.80, $3 x .75 = $2.25, $4 x .50 = $2.00.

Obviously other factors may enter this decision process. For example, an idle work force may persuade you to submit a bid only slightly in excess of variable costs. Or you may wish to submit low bids and accept the loss in profit for the purpose of keeping additional competition from the area. Nevertheless, all these ancillary factors can be better evaluated by management if the relationship of contribution to overhead and profit and probability of success has first been considered.

Credit Decision Illustration: The farm supply sector of the agribusiness industry is particularly plagued with a series of credit decisions. Most farm supply customers receive credit from retailers and no particular problems arise. However, on occasion, a retail outlet manager is faced with the problem of refusing a sale or accepting credit with the knowledge that there exists a real chance that the bill will never be paid. Of course, your reserve for bad debts may determine whether or not a sale under a high credit risk will be made. But for a borderline case, you may wish to figure the odds.

To accept credit for the sale of an item is to subject your firm to the possible loss of the value of the item plus the variable costs associated with the sale. To reject a request for credit may result in your inability to make the sale and the loss of the gross margin on that sale. Suppose you are able to estimate the odds that a customer will pay his bill (and this is being done when a reserve for bad debts is established). Also suppose that the gross margin is 40 percent on an item that sells retail for $100. Thus, if the gross margin is 40 percent and the probability of a customer paying his bill is 70 percent, the probable loss from your refusal to make the sale would be 40% x $100 x 70%, or $28. The probable loss from accepting the customer's credit would be 60% x $100 x

30% , or $18. Obviously the sale should be made.

Again, other factors such as the availability of working capital, competition, etc., may alter your final decision. Nevertheless, figuring the odds enables management to better deal with these factors.

Salary Decision Illustration: Every business manager is at sometime faced with the decision of raising a valued employee's salary or loosing him to another employer. Such decisions are often clouded with personal judgments and anxieties. The costs of replacing an important employee are often substantial, e.g., training, reduced efficiency, recruiting, etc. Offsetting these costs would be the cost of an increased salary such that the valued employee would remain. The problem is complex, but figuring the odds may enable management to minimize costs.

Suppose you have determined that the costs of replacing any of your firm's regional sales managers would be $1000 in employment fees to an agency, $200 in interview costs, $1000 in training costs, and a loss of efficiency during the break-in period totaling $2000. Studies have shown that amongst this group of employees one can expect about 20 percent to resign each year. You currently employ 20 regional sales managers at a total annual compensation of $300,000. A 5 percent salary increase for the group would cost your firm $15,000 per year. However, it is believed that such a salary adjustment would have a 20 percent chance of reducing this year's resignations by 3, and 50 percent chance of reducing them by 2, and a 30 percent chance of reducing them by 1. Hence the probable reduction in employee turnover costs associated with the increase in salary becomes:

20% x 3 x $4,200 = $2,520

50% x 2 x $4,200 = $4,200

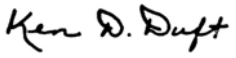
30% x 1 x $4,200 = $1,260

Total $7,980

Since the cost of a salary increase exceeds the potential saving, management should decide to hold the line on salaries and be prepared to accept the costs of resignations.

Summary

Management's ability to figure the odds may partially affect its ability to make those decisions which enhance firm profits. Figuring the odds is shown to incorporate an element of gambling. Three different procedures for figuring the odds are discussed. Risk analysis is shown to be a simple analytic procedure whereby the element of risk is incorporated into the decision process through the use of a discount factor. Sensitivity analysis is shown to be well adapted to those decisions relating to cash flow. It stipulated that the assumptions underlying cash flow projections be changed, one at a time, so that management may observe the impact of such variations. Probability analysis is shown to be similar to sensitivity analysis, except that a percentage probability likelihood is assigned to each value of an assumption. Decisions relating to standby resources, pricing, credit and salaries were shown to be well adapted to probability analysis. The basic formula involves the multiplication of the anticipated profits or costs by the chances (as a percentage) that these profits or costs will be realized to derive the true value of each course of management action. Any manager who begins to think along these lines will be able to make decisions which enhance his company's profits.



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