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CASH FLOW RISK RATIO: AN AID TO MARKETING DECISIONS

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In the past, the fully regulated marketing environment allowed producers to neglect or ignore the marketing side of their business. Now, with an open marketing system and increased volatility in the commodity markets, producers will have the right and the responsibility to determine their own financial security. One of the most difficult questions for producers to answer, is how much of his/her crop must be pre-harvest marketed. Knowing his/her production costs (both variable and fixed) and range of acceptable production, price, and financial risks are the key to determining his/her price objective. Producers can determine their degree of marketing flexibility by using the cash flow risk ratio. This ratio predicts what percentage of the projected crop must be marketed at the expected season average price to meet cash obligations. In this uncertain and risky future, failing to plan may be the same as planning to fail.

1. INTRODUCTION

As recently as a decade ago, South African agriculture was characterised by subsidies and other concessions, which supported producers not only in difficult times, but also in good times. A few years ago, the last agricultural control boards were abolished and the agricultural sector was deregulated, resulting in an extremely dynamic environment. To maintain a successful business, every farmer or producer must be able to respond effectively to changing circumstances. Wise decisions require accurate information about the financial position and activities of the farm concerned.

As these institutional changes occurred, new marketing tools became available to producers who now have the responsibility of marketing their own crops. The marketing time frame for crops can now be divided into three parts - pre-harvest, harvest, and post-harvest. Due to production risk, it is rarely a good idea to price 100 percent of expected production before harvest. The most difficult question for producers to answer is how much of the crop, with which marketing tool, and at what price should be pre-harvest marketed. Producers can choose between spot sales, forward contracts, futures contracts and options on futures contracts as alternative marketing tools.

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The objective of this article is to illustrate how producers, by using a cash flow risk ratio, can determine how much of the crop should be pre-harvest marketed. To achieve the objective the following are addressed:

- quantifying risk and risk management;
- types of risk faced by producers; and
- cash flow risk ratio as an aid to pre-harvest marketing strategies.

2. QUANTIFYING RISK AND RISK MANAGEMENT

Risk is a situation where the outcome is unknown, but the probability of alternative outcomes is known. Risk affects an individual's welfare, and is often associated with adversity and loss (Bodie & Merton, 1998). Risk is uncertainty that "matters" and may involve the probability of losing money, possible harm to human health, repercussions that affect resources (irrigation, credit), and other types of events that can affect a person's welfare. Uncertainty (a situation in which a person does not know with certainty what will happen) is an essential element of risk, but uncertainty does not necessarily result in a risky situation. The degree of uncertainty surrounding an event determines the extent of risk.

Generally, the goals of financial management are defined as surviving, avoiding financial distress and bankruptcy, beating the competition, maximising sales or market share, minimising costs or even maintaining a steady growth in profits. Ross, Westerfield, Jordan & Firer (1996:8-9) simply define the goal of financial management as maximising shareholders' wealth. For a producer, this can be defined as the maximisation of sustainable net worth (assets minus liabilities). It should be noted that, historically, risk management in agriculture has been used as a synonym for crop insurance as a safety net for production risk.

For an individual producer, risk management involves finding the preferred combination of activities with uncertain outcomes and varying levels of expected return. One might say that risk management involves choosing between alternatives that can be used to reduce the effects of risk on a farm, and, in so doing, affecting the farm's welfare position. Some risk management strategies (such as diversification) reduce risk in terms of the farm's operation, others (such as production contracting) transfer risk outside the farm, and still others (such as maintaining liquid assets) build the farm's capacity to bear risk. Risk management typically requires an evaluation of trade-offs between changes in risk, expected returns, entrepreneurial freedom, and other variables. All the financial alternatives must be carefully weighed

up and the most profitable must be selected. The days of non-financial motives such as personal satisfaction seem to be gone for ever.

3. SOURCES OF RISK IN FARMING

Some risks are unique to agriculture, such as the risk of adverse weather which can significantly reduce production levels within a given year. Other risks, such as the price or institutional risk discussed below, are common to all businesses, and, for producers, they reflect an added economic cost. If the producer's benefit-cost trade-off favours minimisation, then he/she can attempt to lower the possibility of adverse effects. These risks include the following (Hardaker, *et al.*, 1997:180-201; Boehlje & Trede, 1977:20-29; Baquet & Jose, 1997:11-14 and Fleischer, 1990: 51-53):

- **Yield risk** occurs because agriculture is affected by many uncontrollable events. These events are often related to weather, including excessive or insufficient rainfall, extreme temperatures, hail, insect plaques, and diseases. Technology plays a key role in reducing production risk in farming. The rapid introduction of new crop varieties and production techniques often offers the potential for improved efficiency, but may at times yield poor results, particularly in the short term. On the other hand, there is always the threat of obsolescence with certain practices (for example, if one uses machinery for which parts became unavailable), which creates another, and different, kind of risk.
- **Price risk** refers to risks associated with changes in the price of outputs or of inputs that may occur after production has begun. In agriculture, production is generally a lengthy process. Livestock production, for example, typically requires ongoing investments in feed and equipment that may not produce returns for several months or years. Because markets are generally complex and involve both domestic and international considerations, producer returns may be dramatically affected by events in far-off regions of the world.
- **Institutional risk** results from changes in policies and regulations that affect agriculture. This type of risk is generally manifested as unanticipated production constraints or price changes for inputs or for outputs. For example, changes in government legislation regarding the use of pesticides (for crops) or drugs (for livestock) may alter the cost of production, or a foreign country's decision to limit imports of a certain crop may reduce that crop's price. Other institutional risks may arise from changes in policies affecting restrictions in conservation practices or land use, or

changes in income tax policy or credit policy. The dismantling of the control boards in South Africa serves as an example of how institutional risk can alter marketing policies and influence the producers' responsibility in farm management.

- Producers are also subject to the **personal risks** that are common to all businesses. Disruptive changes may result from such events as death, divorce, injury, or the poor health of a principal on the farm. In addition, the changing objectives of individuals involved in the farming business may have significant effects on the long-term performance of the operation.
- **Financial risk** differs from the business risks previously described in that it results from the way the firm's capital is obtained and financed. A producer may be subject to fluctuations in interest rates on borrowed capital, or face cash flow difficulties if there are insufficient funds to repay creditors. The use of borrowed funds means that a share of the returns from the farm must be allocated to meeting debt payments. Even when a farm is financed 100 percent by the owner, the owner's capital is still exposed to the probability of any lowering of equity or net worth. Financial risk has three basic components:
 - the cost and availability of debt capital;
 - the ability to meet cash flow needs in a timely manner; and
 - the ability to maintain and increase equity.

Cash flows is especially important because of a variety of ongoing farm obligations, such as cash input costs, cash lease payments, tax payments, debt repayment and family living expenses.

Production, marketing and financial risks on most farms are interrelated. Debt repayment ability depends on production levels and prices received for the products. Financing the production and storage of commodities depends on borrowing ability. Therefore, all three types of risk must be considered together. Producers differ greatly in terms of their willingness to take risks and their ability to survive unfavourable outcomes. Acceptable risk levels are a very important individual decision.

Risk management optimises rather than maximises returns. In the *Wall Street Journal*, April 26, 1994, Tim Ferguson describes risk management as the principle of spreading "risk and reward so that uncertainty does not inhibit commerce". In both financial and agricultural businesses, risk management

strategies are often utilised in the expectation that they can outperform the marketplace. How then, can a financial tool reduce uncertainty while, at the same time it maximise returns?

4 CASH FLOW RISK RATIO AS AN AID TO PRE-HARVEST MARKETING STRATEGIES

One aspect of financial risk management is liquidity. This involves the producer's ability to generate cash quickly and efficiently in order to meet his or her short-term financial obligations. The liquidity issue relates to cash flow. Liquidity is affected by the question which, when adverse events occur, a producer has assets (or other monetary sources) that can be easily converted to cash to meet his or her financial demands. There are three fundamental types of cash demand:

- The first is made by transactions that demand liquidity. This need arises from the normal operation of the farm enterprise.
- The second is a precautionary demand for liquidity and is necessary to respond to business adversity or to meet unexpected demands for cash.
- The third type is an investment demand or speculative demand for liquidity. This demand enables the business to respond to new or unforeseen investment opportunities.

One method of determining liquidity demand is to use a cash flow budget. A cash flow budget lists projected cash inflows and outflows for a specific period. The cash flow budget provides a timed format for examining the financial condition of the farming enterprise, detecting potential problems and suggesting alternative approaches that could be employed to solve these problems. Cash flow requirements consist of the following expenditures:

- ⇒ operating inputs (seed, fertiliser, pesticides, lime, soil tests, scouting, crop insurance, etc.);
- ⇒ machinery costs (fuel lubrication, repairs, custom hire, machine rental, down payments on new or replacement items);
- ⇒ personnel costs (wages, salaries, other labour costs, family living expenses, income taxes);

- ⇒ miscellaneous costs (farm insurance, consultants' fees, tools, supplies, etc.); and
- ⇒ debt payment (principal and interest on term loans, interest only on operating loans).

Using the cash flow budget, it is possible for producers to determine their production costs per hectare. If they know their production cost, producers can improve their marketing by:

- providing a pricing objective by discovering break-even prices;
- determining the portion of the total crop that must be sold at a particular price to ensure that they can meet cash commitments;
- determining the portion of the crop that can be left unpriced once minimum earnings and cash flow commitments have been realised;
- understanding the earnings and cash flow implications of selling the crop at a particular price; and
- reducing emotional involvement while adding focus and discipline to the marketing decision.

The degree of marketing flexibility in a given financial situation can be estimated by means of the cash flow risk ratio. It is calculated as follows:

$$\text{Cash flow risk ratio} = \frac{\text{cash flow break - even price per hectare}}{\text{expected market price}}$$

The cash flow risk ratio can be used to predict what percentage of the projected crop must be marketed at the expected season average price to meet cash obligations. The break-even price/yield increases or decreases as yields change. If yield declines, the percentage of crop required to meet cash flow needs increases. After cash flow needs are met, remaining production can be marketed using methods intended to gain the highest possible net price.

Producers who have low cash flow needs and substantial operating capital and borrowing capacity have more flexibility in terms of how they market their commodities. Their marketing plan is dictated mainly by their expectations of price movements, storage costs and income tax management. Cash flow requirements can be very different for different producers. The

amount of outstanding debt serviced and whether land has been purchased or rented have the greatest impact. The following example illustrates this point. Four hypothetical producers, all produce 600 hectares of maize in Mpumalanga annually, using similar technology on similar land. Only their land holding and debt situations differ.

- Oscar Owner holds title to all the land he farms and is debt-free.
- Richard Renter cash rents his entire land base, and has some debt because he needed to purchase machinery.
- Chris Cropshare has a 50 percent lease agreement with a great-aunt on all his land, and also owes some money on machinery.
- Bruce Buyer recently purchased 250 hectares of crop land and cash rents another 350 hectares. He has the same machinery debts as Renter and Cropsharer.

The cash flow requirements for one crop (maize) is calculated in Table 1.

Table 1: Hypothetical cash flow requirements for maize on a 600 hectare farm

Item	Owner	Renter	Cropshare	Buyer
Operating inputs	426 000	426 000	426 000	426 000
Machinery costs	222 000	222 000	222 000	222 000
Personnel costs	96 000	96 000	96 000	96 000
Insurance (short-term)	48 000	48 000	48 000	48 000
Land costs (rent)	0	72 000	36 000	42 000
Miscellaneous costs	48 000	48 000	48 000	48 000
Debt payments	0	50 000	50 000	50 000
Total cash flow needs	840 000	962 000	926 000	932 000
Hectares planted	600	600	600	600
Cash flow cost per hectare	1 400	1 603	1 543	1 553
Expected or actual yield (ton per ha)	3.25	3.25	3.25	3.25
Cash cost break-even price	431	493	475	478
Expected market price (R/ton)	640	640	640	640
Cash flow risk ratio	67,3%	77,0%	74,2%	74,7%

The cash flow risk ratio indicates what percentage of the crop must be sold at the expected market price to meet all cash obligations. Once that demand has been met, the remaining production can be marketed using methods intended to gain the highest possible net price, regardless of risk. Owner has 32.7% of his crop available for speculation. The higher the cash flow risk ratio, the more important it is to lock in a price at or above the break-even price when it is available, and the less a producer can afford to speculate on the possibility of achieving a higher price. A cash flow risk ratio greater than 100 percent means that it is possible that savings and/or borrowings will have to be used to meet the cash flow needs for a given year. It is important to calculate the cash flow risk ratio for each of the major crops produced by a producer. Although the cash flow risk ratio can be used as a standard for pricing decisions, it is not necessarily a price goal. A price goal must be based on the needs of a business combined with price levels currently and potentially offered by the market. The price goal change from year to year, or even more often, depending on changing market conditions. In some years, the market may not offer a break-even price at any time, and strategies to minimise loss that are needed.

But, what about the producer who is diversifying his crops to manage production risk. He can also use the cash flow budget to manage his price risk. The following example illustrates how the cash flow budget can assist a producer in determining how much of his/her crop must be sold at a given price. Dave Diversify, who is debt-free, hold the title to a 600 hectare farm in Mpumalanga. There he plants 200 ha each of maize, sunflower seed, and sorghum. The cash flow budget of Dave Diversify is set out in Table 2.

Sorghum has the lowest cash flow risk and Dave has 41.1% of his sorghum left to speculate with. The higher the cash flow risk ratio, the more important it is to lock in a price at or above the break-even price when it is available, and the less a producer can afford to speculate on the possibility of achieving a higher price.

The formula for the contribution margin is the following:

$$\text{Contribution margin} = \frac{\text{fixed cost}}{\text{contribution per unit}}$$

From the table it is clear that Dave has 59 ton of maize available for speculating. The cash flow break-even price is a reference point indicating the availability of extra cash for potential shortfalls. The break-even price for

maize is R584.62 per ton; that is the price needed to cover all costs. A price above R584.62 per ton implies a return for taking a risk. The margin of safety indicates by how much sales may decrease before a producer will suffer a loss. The margin of safety only calculates by how much the net market price of the crop can decrease before a producer will suffer a loss. In the example, the market price of maize can decrease by only 9.1% before Dave will suffer a loss.

Table 2: Hypothetical cash flow requirements for a diversified farm

Item	Maize	Sunflower	Sorghum
Operating inputs	142 000	80 000	127 000
Machinery costs	74 000	70 000	74 000
Personnel costs	32 000	32 000	32 000
Insurance (short-term)	16 000	12 000	15 000
Miscellaneous costs	16 000	16 000	16 000
Total cash flow needs	280 000	210 000	264 000
Cash flow cost per hectare	1 400	1 050	1 320
Expected or actual yield	3.25	1.3	3.5
Cash cost break-even price	431	808	377
Expected market price ¹	600	1 050	640
Total cash receipts	390 000	273 000	448 000
Cash flow risk ratio	71.8%	76.9%	58.9%
Farm living expenses ²	100 000	100 000	100 000
Contribution margin	591	413	380
Quantity available for speculation	59	-153	320
Break-even price	584.62	1 192.31	520.00
Margin of safety	9.1%	-58.9%	45.7%

¹⁾ Market price represents the net amount after all marketing costs were subtracted.

²⁾ A total of R300 000 of farm living expenses is allocated on the number of hectares planted by each crop.

5. CONCLUSION

Over the past few years, South African agricultural policy underwent dramatic and far-reaching changes, moving from a fully regulated marketing environment towards an open system, where market forces determine price levels. The resource limitations of a producer, unpredictable weather patterns and fluctuating economic and market conditions make planning difficult.

Nevertheless, understanding the principles of financial farm management can help a producer to maximise his/her net worth over a sustainable period.

Financial measures are intended to help producers analyse their farming activities from a financial perspective and provide information which is useful in making good management decisions. By themselves, the financial measures discussed do not provide answers - they need to be reviewed in relation to each other and to other farming and non-farming activities. It is not possible to control or predict all the factors that influence the final outcome of any farming decision. Nor is it possible to have available all the information that would be ideal. But decision-making can be improved by using available information and by effective financial planning and analysis.

REFERENCES

BACQUET, A. & JOSE, D. (1997). *Understanding agricultural risks: Production, marketing, financial, legal, and human resource*. U.S. Department of Agriculture, Risk Management Agency.

BODIE, Z. & MERTON, R.C. (1998). *Finance*. Upper Saddle River, NJ: Prentice Hall.

BOELHLJE, M.D. & TREDE, L.D. (1977). Risk management in agriculture. *Journal of the American Society of Farm Managers and Rural Appraisers*, 41:20-29.

FLEISHER, B. (1990). *Agricultural risk management*. London: Lynne Rienner Publishers, Inc.

HARDAKER, J.B., HUIRINE, R.B.M. & ANDERSON, J.R. (1997). *Coping with risk in agriculture*. New York: CAB International.

ROSS, S.A., WESTERFIELD, R.W., JORDAN, B.D. & FIRER, C. (1996). *Fundamentals of corporate finance*. London: Irwin.