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SOURCES AND MANAGEMENT OF RISK IN EXTENSIVE LIVESTOCK FARMING IN THE NORTH-WESTERN TRANSVAAL BUSHVELD

V Swanepoel

Agricultural Economist, Directorate of Agricultural Economics, Department of Agriculture, Pretoria

GF Ortmann

Associate Professor, Department of Agricultural Economics, University of Natal, Pietermaritzburg

Abstract

A survey involving 93 farmers in the North-Western Transvaal Bushveld reveals sources of and responses to risk in farm production, marketing and financing. Main sources of risk were considered to be variations in livestock production, rainfall and livestock prices, the threat of land reform, and changes in input costs. The most important production responses to risk include low-cost production, choice of production system and changing livestock numbers. Acceptance of the floor price scheme was regarded as the most important marketing response to risk, while financial record keeping, debt management and maintaining credit reserves were considered the major financial responses to risk. The results could assist policy makers, lenders, extension officers and consultants in designing appropriate risk management programmes and strategies for farmers in the study area.

Uittreksel

Bronne en bestuur van risiko in ekstensiewe veeboerdery in die Noordwes- Transvaalse Bosveld.

Resultate van 'n opname onder boere in die Noordwes-Transvaalse Bosveld dui op bronne van en responsies tot risiko betreffende produksie, bemarking en finansiering. Hoofbronne van risiko is variasies in veeproduksie, reënval en veepryse, die bedreiging van grondhervorming en veranderde insetkoste. Die belangrikste produksie responsies tot risiko sluit in lae-koste produksie, keuse van produksiesisteme en verandering in veegetalle. Aanvaarding van die vloerprysstelsel is beskou as die belangrikste bemarkingsrespons tot risiko. Die vernaamste finansiële responsies sluit finansiële rekordhouding, bestuur van skuldverpligtinge en behoud van kredietreserwes, in. Die resultate kan beleidmakers, leners, voorligtingsbeamptes en konsultante help om gepaste risikobestuurstrategie vir boere in die studiegebied te ontwerp.

1. Introduction

Farmers operate in a risky environment which is characterized by variable weather conditions, fluctuating prices, changing policy measures and improving technology. Ortmann *et al.* (1992) examined sources of and responses to risk among leading Cornbelt farmers in the USA. This study is similar in its examination of sources of and farmers' responses to risk, but deals with extensive livestock farmers in the North-Western Transvaal Bushveld. The current economic and political climate in South Africa places emphasis on research which identifies the causes of risk and methods for managing risk in agriculture.

The source of data and a summary of the characteristics of the sample of respondents is presented in the next section. This is followed by an evaluation of the main sources of risk for the extensive livestock farmers and a discussion of the practices which the respondents consider to be important for managing risk. The results could assist policy makers, lenders, extension officers and consultants in designing appropriate risk management programmes and strategies for farmers in the study area.

2. Data source and characteristics of respondents

During 1992 the Directorate of Agricultural Economics, in conjunction with the Transvaal Agricultural Union and

the Red Meat Producers' Organization, conducted a survey amongst farmers in the North-Western Transvaal Bushveld. District Agricultural Union representatives were contacted and questionnaires were left with them for distribution to farmers. Unfortunately, the survey resulted in a disappointingly low usable response of 7,6 percent, representing 93 farmers. Nine districts were represented in the sample, with 24 percent of the respondents from Zeerust, 24 percent from Waterberg, 16 percent from Ellisras, 12 percent from Potgietersrus, 10 percent from Thabazimbi, eight percent from Rustenburg, four percent from Soutpansberg and two percent from Swartruggens (Van der Watt, 1993).

The respondents' average farm size was 2 272 hectares, of which 21 percent was rented. Beef cattle sales accounted for an average of 68 percent of gross income, game for 11 percent and cash cropping eight percent. The remaining 13 percent was obtained from off-farm sources. The average debt-asset ratio of the study farms was 22,5 percent. Average net farm income per R100 capital investment was -R6,73 in 1991/92. The main reason for the poor financial performance was identified as the recent drought which resulted in lower production and high purchased feed expenditure. Furthermore, over-capitalization in fixed improvements relative to livestock was identified as another cause. Farmers in the region practised an average stocking density of 11,4 hectares per large stock unit (Swanepoel, 1993).

3. Sources of risk

The questionnaire allowed farmers to rate various sources of risk in terms of their perceived importance on a scale of one (not important) to five (very important). Sources of risk identified by Ortmann et al. (1992) were used as well as additional sources thought to contribute to risk in the study area. These include changes in the stock-reduction scheme, rainfall variability, changes in labour laws, unionisation of labour, changes in the political environment, threat of land reform, changes in Meat Board policy and changes to the Marketing Act. Table 1 lists the various sources of risk considered, the mean ratings and the percentage of farmers who responded with a four or a five on the five-point scale. Rankings of the risk sources are in terms of the mean ratings. Generally, the rankings also follow the percentage of respondents who indicated either a four or a five on the five-point scale.

Results shown in Table 1 reveal that farmers ranked all sources of risk as important, with most sources receiving a mean rating of four or more on the five-point scale. When comparing these results to those of the Cornbelt (Ortmann et al., 1992), where the mean ratings ranged from 2,86 to 4,31, it appears that farmers in the North-Western Transvaal Bushveld perceive their environment generally as much more risky, with ratings ranging from 3,88 to 4,80.

The highest ranked sources of risk were variations in livestock production (4,80) and rainfall variability (4,79). These two sources are expected to be closely related. The recent drought appears to have had a major impact on respondents' perceptions of these two risk sources. Livestock price variability ranked third (4,77), revealing vulnerability of the livestock industry to fluctuating prices. Following this was the threat of land reform (4,67), showing that in addition to production and price risks, commercial farmers are also burdened with uncertainty in the political environment (4,37).

Changes in input costs (4,64) ranked fifth. The continuing cost-price squeeze in the livestock industry has contributed to low profitability (Swanepoel, 1993). Injury, illness or death of the farmer (4,51) and changes in family relationships (4,07) were also perceived to be important. This suggests a need for further research on how farmers can cope with these risks.

Changes in interest rates (4,48) was ranked highly, with 86 percent of respondents giving this risk source a value of four or five. Swanepoel (1993) reported an average debt-asset ratio of 22,5 percent on the study farms. This ratio is considered to be high. Due to the price fluctuations occurring in the red meat industry, a long term debt-asset ratio for extensive livestock farming should preferably not exceed 10 percent (Wilsenach, 1993). Understandably, therefore, interest rate fluctuations are considered to be a major source of risk. Changes in credit availability (4,06) had a much lower ranking, indicating that credit institutions may be inclined to lend to farmers and giving less consideration to farm profitability during drought conditions. Government support in the past may have given rise to expectations that this financial assistance would continue.

About 90 percent of respondents gave marketing cost variations (4,46) a high rating. Changes in the cost of capital items (4,45) followed closely. Changes in labour laws (4,34), changes in labour availability (3,92) and unionization of labour (3,88) may represent political risks for these farmers as their dependency on labour, due to the extensive nature of their farms, is low.

Changes in technology (4,33) was also considered to be important. In the current state of low farm profitability, any competitive advantage becomes important. Crop yield variability (4,22) and crop price variability (4,11) ranked lower, due most likely to the low frequency of crop farmers in the sample.

Changes in land rental and price (4,13) was also considered to be an important source of risk. Farmers are under pressure to increase farm size, either by purchasing or renting more land, in order to spread fixed costs and conserve veld. Swanepoel (1993) reports an average farm size increase of 14 percent in the study area since 1979.

Changes to the Marketing Act (4,12) and in Meat Board policy (4,10) were also rated highly, implying a dependency on formal marketing structures. Changes in the stock reduction scheme (4,02) was also perceived as an important source of risk. Swanepoel (1993) reported that farmers in the study area had reduced stock numbers by 32 percent since 1979. This could be a result of the recent drought as well as improved management practices.

In general, the respondents' perceptions of the relative importance of various sources of risk are much higher than for crop farmers in the US Cornbelt (Ortmann, et al., 1992). This may be attributed to a relatively more stable climatic and political environment in the US Cornbelt. Extensive livestock farming has traditionally been considered less risky than cash cropping in South Africa. However, this may not always be the case, and farmers, economists, lenders, extension officers and consultants should seriously consider alternative ways in which farm risk management could be improved. Some guidelines are presented in the following section.

4. Responses to risk

Possible production, marketing and financial responses to risk similar to those asked by Ortmann et al. (1992) were used in this study. However, some additional possible responses were included, such as choice of production system, changing number of labourers, capital items, livestock numbers and farm size, as well as different marketing responses. Farmers were asked to rank responses on a scale of one (not important) to five (very important). Table 2 lists the mean ratings of various management responses, their rankings and the percentage of respondents giving a high rating (four or five on the five-point scale) for each management practice. Generally, the rankings based on the mean ratings follow the proportion of farmers who responded with a four or a five on the scale used.

An important production response to risk, according to the mean rating of 4,63, was low-cost production. Given the low profitability of farms over the past season this represents a critical survival measure for farmers in the study area. Choice of production system (4,54), for which over 94 percent of respondents voted with a four or a five, and changing livestock numbers (4,39) were also ranked highly. These production responses represent a logical approach to dealing with the cyclical nature of red meat production (Lanvokon, 1993).

Keeping physical production records (4,26) was also considered to be an important management practice. Swanepoel (1993) indicated that management has improved on the study farms since 1979. Poor managers cannot hope to survive in the fluctuating (risky) livestock industry.

Table 1: Relative importance of various sources of risk for farmers in the North-Western Transvaal Bushveld, 1992

Sources of Risk	Mean Ratings*	Rankings	Percent 4&5's**
Livestock production variability, eg. calving percentage, mortality	4,80 (0,08)	1	96,7
Livestock price variability	4,77 (0,07)	3	95,6
Crop yield variability	4,22 (0,16)	13	82,4
Crop price variability	4,11 (0,17)	16	77,0
Rainfall variability	4,79 (0,07)	2	96,7
Changes in costs of inputs	4,64 (0,09)	5	90,7
Changes in land rental/price	4,13 (0,13)	14	75,6
Changes in costs of capital items	4,45 (0,10)	9	86,2
Changes in technology	4,33 (0,11)	12	83,7
Changes in interest rates	4,48 (0,12)	7	86,0
Changes in credit availability	4,06 (0,14)	19	72,9
Injury, illness or death of farmer	4,51 (0,11)	6	88,2
Changes in family relationships, eg. divorce	4,07 (0,15)	18	73,5
Changes in labour laws, eg. minimum wages	4,34 (0,14)	11	81,8
Unionization of labour	3,88 (0,17)	22	68,2
Changes in labour availability	3,92 (0,12)	21	69,3
Changes in stock-reduction scheme	4,02 (0,14)	20	74,4
Changes in political environment	4,37 (0,11)	10	83,7
Threat of land reform	4,67 (0,09)	4	91,3
Changes in Meat Board policy	4,10 (0,12)	17	75,0
Changes to Marketing Act	4,12 (0,11)	15	78,3
Marketing cost variations	4,46 (0,10)	8	90,2

* Where 1 = not important, 5 = very important. The mean ratings include the ratings of those farmers who responded to the question, ie. the means include only nonmissing values. Figures in parentheses show the standard error of the mean.

** Shows the percentage of farmers who responded with a 4 or a 5 on a scale of 1 (not important) to 5 (very important).

Farmers recognized the need for diversification of enterprises (4,18) and the geographic dispersion of production (4,07). Two-thirds of the respondents considered farm size changes and reducing the number of labourers as important production responses to risk.

The respondents considered the floor price scheme (4,45) as the most important measure to reduce marketing risk. Marketing direct to the consumer (4,29), which supports recent deregulatory measures in the meat industry, and utilizing marketing records (4,17) also ranked highly.

Forward contracting of product prices (3,82) was the lowest-ranked marketing response. In the past, most farmers had to sell their livestock through formal marketing channels. Following deregulation, however, farmers will have the opportunity to negotiate better product prices.

Financial record keeping (4,60) was considered as the most important financial response to risk. This was closely followed by debt management (4,45) and main-

taining credit reserves (4,39), which ranked joint second in the study by Ortmann et al. (1992) after liability insurance.

Life assurance (4,08) also ranked highly. Given the cyclical nature of the livestock industry, farmers need to provide for their retirement. Insurance of assets (3,79) was considered to be important by 63 percent of the respondents. During periods of financial stress, farmers may reduce expenditure on insurance to save on costs.

Non-farm investments (3,26) were not perceived as very important, but 60 percent of the respondents considered non-farm income as important. Income from off-farm sources accounted for 13 percent of the respondents' gross income in 1991/92. Farmers should consider investing off the farm during favourable financial times in order to have a source of revenue during adverse times. Crop insurance was considered as relatively unimportant (2,51), due most likely to the low frequency of crop farmers in the sample.

Table 2: Relative importance of production, marketing, and financial responses to risk for farmers in the North-Western Transvaal Bushveld, 1992.

Risk Management Responses	Mean Ratings*	Rankings	Percent 4&5's**
Production Responses			
Type of production system	4,54 (0,08)	2	94,4
Diversification	4,18 (0,11)	5	81,7
Geographic dispersion of production	4,07 (0,12)	6	71,3
Low-cost production	4,63 (0,08)	1	93,3
Reducing number of labourers	3,80 (0,13)	7	67,0
Increasing number of labourers	2,69 (0,17)	12	30,0
Reducing capital items	3,43 (0,15)	10	55,8
Increasing capital items	2,98 (0,16)	11	38,6
Keeping physical records	4,26 (0,11)	4	80,5
Changing number of livestock	4,39 (0,09)	3	91,0
Decreasing farm size	3,72 (0,17)	9	66,3
Increasing farm size	3,77 (0,15)	8	67,0
Marketing Responses			
Importance of Floor Price Scheme	4,45 (0,09)	1	87,0
Gathering, analyzing and keeping market information	4,17 (0,12)	3	81,1
Marketing direct to consumer	4,29 (0,11)	2	80,0
Forward contracting of prices	3,82 (0,13)	4	70,2
Financial Responses			
Crop insurance	2,51 (0,15)	8	24,4
Insurance of assets	3,79 (0,15)	5	63,3
Life assurance	4,08 (0,13)	4	72,2
Non-farm investments	3,26 (0,16)	7	48,9
Non-farm income	3,53 (0,15)	6	60,0
Maintaining credit reserves	4,39 (0,11)	3	87,5
Debt/leverage management	4,45 (0,11)	2	92,0
Financial record keeping	4,60 (0,09)	1	92,2

Where 1 = not important, 5 = very important. The mean ratings include the ratings of those farmers who responded to the question, i.e. the means include only nonmissing values. Figures in parentheses show the standard error of the mean.

** Shows the percentage of farmers who responded with a 4 or a 5 on a scale of 1 (not important) to 5 (very important).

Respondents were asked whether they would consider more information on risk management in production, marketing, finance and overall farm management to be useful. A scale of one (not important) to five (very important) was used to indicate the relative importance of more information. The mean scores in Table 3 show that additional information on risk management in all areas is considered to be important. The analyses presented in Table 1 and Table 2 give an indication of the areas in which farmers would want more information.

5. Conclusions

Farmers in the North-Western Transvaal Bushveld perceive variability in livestock production and rainfall to be the most important sources of risk. These two aspects are expected to be closely related. The current low average profitability of farms in the study area is a result of lower production and additional costs incurred during the recent drought.

Table 3: Relative importance of more information on risk management for farmers in the North-Western Transvaal Bushveld, 1992.

Management Areas	Mean Score*	Percent 4&5's**
Farm production	4,14 (0,11)	77,9
Product Marketing	4,20 (0,12)	81,4
Farm finance	4,17 (0,11)	80,5
Overall farm management	4,23 (0,11)	82,6

* Where 1 = not important, 5 = very important. The mean ratings include the ratings of those farmers who responded to the question, i.e. the means include only nonmissing values. Figures in parentheses show the standard error of the mean.

** Shows the percentage of farmers who responded with a 4 or a 5 on a scale of 1 (not important) to 5 (very important).

It is recommended that, where possible, farmers should attempt to build up fodder banks to prevent relatively costly feed expenditures during droughts. In addition to environmental risks, producers face price uncertainty and other risks.

Political risks in the form of threats of land reform, for example, exert additional management pressures on producers. Policy makers and political leaders should attempt to create a stable political climate which would promote investment and confidence in the future of commercial agriculture.

Lending institutions, who should be circumspect about lending to over-leveraged farmers, could also become more involved with farmers in establishing risk-management strategies. Such cooperation could be mutually beneficial.

Results of this study indicate that farmers are still very dependent on formal marketing channels and regard the floor price scheme as an important measure to alleviate marketing risk. However, producers who are able to use other marketing channels more profitably, should be allowed to do so. Deregulatory measures now being undertaken in various industries (including meat) will add more flexibility in marketing.

Farmers can respond to risk in various ways by, for example, lowering production costs, choosing appropriate production and marketing systems, and improving financial management (keeping more comprehensive records and reducing debt). Off-farm investments and income could serve as important sources of revenue during critical financial times on the farm.

This study has given evidence of the perceived sources of risk and the risk management practices that a sample of extensive livestock farmers in the North-Western Transvaal Bushveld consider to be important. These results could assist policy-makers, lenders, extension officers and consultants in designing, together with the farmers, appropriate risk management programmes and strategies.

Notes

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2. Constructive comments by Mr MAG Darroch and Mr JB Levin of the Department of Statistics and Biometry at the University of Natal on the presentation of results are also gratefully acknowledged.

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