DIVERSIFICATION AS A RISK STRATEGY IN TIMES OF CHANGE: A STUDY IN THE EASTERN ORANGE FREE STATE

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Abstract

Data from 100 commercial farmers in the Aberfeldy pedosystem (situated in the North-eastern Orange Free Sate) were used to analyse diversification as a risk alleviating strategy. In theory, diversification reduces risk, but when the ability with respect to management or entrepreneurship is ignored, diversification may increase risk. Results show that any excessive attitude towards risk is undesirable. Both risk averters and risk seekers showed a greater probability of finacial deterioration or failure. Risk neutrality seems to be the optimal strategy.

Uittreksel

Data van 100 kommersiële boere in die Aberfeldy pedosisteem (geleë in die Noord-oos Vrystaat) is gebruik om diversifikasie as 'n risiko versagtende strategie te ontleed. Volgens die teorie kan risiko verminder word deur te diversifiseer, maar wanneer die vermoë van die bestuurder of entrepreneur geignoreer word, kan risiko verhoog word. Resultate wys dat enige buitensporige houding ongewens is. Risiko soekers en vermyders het beide 'n groter waarskynlikheid van finansiële agteruitgang of mislukking getoon. Dit blyk dat risiko neutraliteit die optimale strategie is.

1. Introduction

Managing risk in agriculture is a topic of continuing interest. A complex risk environment has emerged over the past decade, reflecting the farm sector's growing sensitivity to forces in the general economy, government policy and international markets. This environment demands strong skills in production, marketing and financial management. Risk management skills are an important component of superior management in each of these areas.

In deciding on a business strategy, three basic problems of management determine the adaptation process, namely the entrepreneurial, production and administrative problems. The entrepreneurial problem consists of defining the mission. The production problem involves establishment of a system for producing, controlling and distributing goods; the administrative problem revolves around planning and developing the business for finding solutions to the entrepreneurial and engineering problems (Griffin, 1987).

Entrepreneurship, defined as the capacity for innovation, investment and expansion in new markets, products and techniques, means that there is an entrepreneur at work whenever someone takes risks and invests resources to make something new, designs a new way of making something that already exists or creates new markets (Griffin, 1987; Leff, 1980).

Entrepreneurship and management are not synonymous concepts; the first job of the manager is to make a business perform well. He takes resources and synchronizes them into production. In contrast, the job of an entrepreneur is to bring about change on purpose. Even in an entrepreneurial environment management skill is essential. The difference between the two lies in the choice of tools (March, 1984). Entrepreneurship is a synonym to change.

The present depressed state of agriculture in South Africa, particularly the grain sector, renders high levels of technical and managerial competence indispensable for profitable farming. **However, not all people can improve management of existing entities and simultaneously successfully diversify into new ventures. This is one of the most distinguishing factors among farmers.**

Van Zyl *et al* (1993) showed that the agricultural sector showed a steady decline in its financial performance since 1973 with the largest downswing in 1983 when a recovery phase started. The decline is parially attributable to the cost-price squeeze, which obviously exerts considerable pressure on income. The negative trend was, however, countered by an annual growth in total factor productivity of 4,63% since 1983.

Van Schalkwyk (1992) calculated output/input price ratios for the statistical regions of South Africa. Large variations were found. Regions with more variable rainfall are subject to larger risks than those with more stable precipitation. Different regions are devoted to the production of different commodities. Differences in relative prices therefore exist among different regions which, in addition, are not equidistant from markets and are not equally well served by transport and marketing infrastructure. The difference in attainability of favourable prices gives rise to differences in price risks. Some regions tend to specialize in products with a high degree of price variability. Farming in these regions is subject to higher financial risk, as is farming in regions with high output/input ratios and regions with above average indebtedness.

However, risk does not vary only amongst regions, it also varies between districts and even between neighbours. Farmers differ as they may not choose the highest income possibility and the greatest risk. They may also choose the lowest risk and the lowest income. The best choice depends on their financial position and ability to

stay in the game (Van Zyl and Groenewald, 1986). It is therefore relevant to analyze farmers' different attitudes towards risk management and the results thereof on their economic performance.

2. Risk and agricultural production

Due to imperfect knowledge about the future, producers cannot predict future yields, prices and production outcomes with certainty. Planning and precautions taken, or not taken, to minimize risk can make the difference between success and failure. Six important kinds of change or uncertainty give rise to risk; namely price uncertainty, yield uncertainty, the possibility of new technology, government policy, the actions of others involved in the same business environment and the uncertainty of personal or health incidents surrounding the manager himself (Heady and Jensen, 1955). Managerial actions to counter uncertainty include: predicting the future as best as possible, planning which is consistent with the predictions and implementing the plans. Precautionary measures against uncertainty can also have three distinct forms: measures to reduce the variability of income, measures to prevent profit from falling below a specific minimum level and measures to increase the producer's ability to withstand unfavourable economic outcomes.

Farmers increasingly have to cope with income pressures and policy uncertainties. This may render diversification attractive to farmers. In static theory, diversification usually reduces risk. However, under a low level of management, diversification may increase risk. Planning is thus necessary to reduce risk. The evidence clearly shows that farmers are not well-equipped to plan business developments outside their established field of experience (Haines, 1987). Their experience, training and daily management tasks have not equipped them for the competitive business environment beyond the farm gate. The reasons are simple. Agricultural price support has protected them from the realities of commercial competition and sophisticated business skills were not necessary for survival. Technical proficiency and productivity gains were the keywords. The emphasis has been on production; some types of market regulation (eg. one channel marketing) did not leave room or need for development of marketing skills. The macroeconomic environment was also much more favourable and stable.

Precautions to counter uncertainty can take on various forms. One of the most common precautions taken to reduce risk and uncertainty is diversification. Some forms of diversification is carried out solely to realise the greatest profit without concern for variability in prices and yields and the inherent risk associated with it. However, diversification can also be used as a strategy to reduce risk. The theory is that profits with specialization in a single crop will be greater, but two or more products may be produced to reduce the risk of very low incomes in some years.

Diversification to reduce uncertainty, like all other strategies, comes with a cost. The cost is the income sacrificed over a period of years by organizing the farm to reduce the variability of income between years. Diversification to reduce risk means that income will probably not be too low in bad years, but will also not be as high in good years.

If enterprises are to offset each other for income variations, they must possess certain characteristics. Their prices and yields should have as little positive correlation as possible. The higher the correlation between prices and yields, the less effective diversification is. Diversification to lessen income variability, or to distribute the risk, is more effective as a means of combating yield variability (Heady and Jensen, 1955).

3. Research approach

Comprehensive data collected by Koch in 1981 and 1991 from 100 farmers in the Aberfeldy pedosystem in the north-eastern Orange Free State were used in this study (Koch, 1985). The respondents were arbitrarily divided into three groups according to their attitude towards risk. The different risk approaches were measured with five arbitrary questions ranging from how they see their attitude towards risk in relation to other farmers in the region, to indirect questions to measure the correctness of the answers on the direct questions. The respondents had to assign a number between 1 and 5 to the different questions, with higher values indicating higher risk levels. High correlations were obtained between the questions ($r > 0,8$; $p < 0,05$), indicating that the methodology is suitable for purposes of this analysis.

The respondents' different attitudes towards risk were tested for correlations with other variables, namely the farmers' age, experience, level of education, managerial ability measured according to the method proposed by Burger (1971), gross and net farm income, debt and choice of enterprise mix. This was done to determine whether different strategies and characteristics can be linked to risk attitudes. A t-test was subsequently done to determine whether the above characteristics and strategies differ significantly between the different risk groups (i.e. the risk seekers, averters and risk neutral farmers). The effects of risk attitudes on the economic performance and survival of the different risk groups were subsequently measured. Of the 100 original respondents surveyed in 1981 only fifty were still farming in 1991. Of the fifty dropouts, 20 died or retired, while 13 left farming because of financial problems (i.e. were sequestrated, sold their farms or had chosen to rent their farms out). The rest stopped farming due to other reasons. This dropout can be regarded as normal.

4. Results and discussion

The Pearson's correlation coefficients between farmer characteristics, strategy and financial indicators on the one hand, and risk rating on the other (Table 1), reveal interesting patterns with respect to risk preferences. According to table 1, farmers who have a risk preference have better managerial abilities, higher levels of education, larger cultivated areas, higher non-farm income, higher returns on own capital, their wheat and potatoes' contribution to net farm income is bigger, they have a larger debt load and a larger net farm income. Farmers who are risk averse are more experienced, older and their dairy's contribution to net farm income is larger.

The respondents were subsequently divided on basis of their risk ratings assigned on a basis of the five questions mentioned earlier. Forty-four respondents were identified as risk seekers, thirty were risk neutral and twenty-six were risk averse. Table 2 shows the means of these three groups with respect to certain key variables. In many cases these means differ significantly between groups. According to table 2, risk seekers have superior managerial abilities, they are younger, own larger cultivated areas, they have higher education levels and their net farm income is higher, but they also have a higher debt load per hectare.

Table 1: Pearson's correlations between risk rating and farmers' characteristics, strategy, the different products contribution to net farm income and financial indicators, 1981 (n=100)

Characteristic and strategy		Products contribution to NFI (%)		Financial indicators (per ha)	
Variable	r	Variable	r	Variable	r
Managerial ability	0,48997 (0,0001)*	Potatoes	0,17507 (0,0815)	Debt load	0,34133 (0,0005)
Age (years)	-0,53552 (0,0001)	Maize	0,16034 (0,1110)	Non-farm income	0,19240 (0,0551)
Experience (years)	-0,49057 (0,0001)	Sorghum	0,02026 (0,8415)	Net farm income	0,27406 (0,0058)
Level of education (years)	0,29799 (0,0026)	Wheat	0,20672 (0,0391)	Gross farm income	0,41968 (0,0001)
Diversification (level)	0,10485 (0,4687)	Dry beans	0,06159 (0,5427)	Return on own capital	0,20677 (0,0390)
Cultivated area	0,44203 (0,0001)	Sunflower	0,04593 (0,6500)	Return on total capital	0,14406 (0,0390)
		Dairy	-0,24080 (0,0158)		
		Beef	-0,03619 (0,7208)		
		Sheep	-0,15011 (0,1361)		

* Figures in parenthesis are p-values

Table 2: Means of different risk groups with respect to some key variables, 1981 (n = 100)

Variables	Means of different risk groups			Significance of difference between means (p< F)		
	Averters	Neutral	Seekers	Averters and Neutral	Neutral and Seekers	Averters and Seekers
Characteristics and strategy:						
Managerial ability	15,5	19,9	21,5	0,0005	0,2629	0,0006*
Age (years)	52,9	40,9	38,3	0,0001*	0,3540	0,0000
Experience (years)	30,5	18,3	15,7	0,0001*	0,3246	0,0001
Level of education (years)	11,5	12,6	13,1	0,0075	0,2461	0,0227
Diversification (level)	12,2	12,5	13,8	0,8827	0,4834	0,5261
Cultivated area (ha)	210,7	417,8	625,6	0,0432*	0,0572	0,0011
Products contribution to NFI (%):						
Potatoes	1,8	2,0	5,0	0,2492	0,8820	0,1848*
Maize	21,8	31,9	26,4	0,2121	0,0030	0,1200
Sorghum	-	0,3	-	-	0,2286	-
Wheat	11,7	19,3	18,6	0,8663	0,0401	0,0875
Dry beans	6,7	10,4	9,1	0,7177	0,2773	0,4916
Sunflower	0,2	1,8	0,31	0,1252*	0,0968*	0,6839
Dairy	25,5	13,5	10,5	0,5337	0,0342	0,0105*
Beef	15,2	8,3	15,3	0,3310	0,0587	0,9710*
Sheep	14,5	8,8	10,7	0,5366	0,0551	0,2322
Financial parameters (R per/ha):						
Debt load	86,31	163,1	191,3	0,0242	0,4012	0,0059
Non-farm income	8,0	8,1	18,5	0,9428	0,3600*	0,1382*
Gross farm income	116,5	213,3	223,1	0,0323	0,7873	0,0000
Return on own capital	7,7	17,8	13,0	0,0313*	0,2490	0,0062
Return on total capital	6,5	13,8	9,87	0,1010	0,3696	0,0111

* Non-parametric t-values for unequal variances

Table 3: Risk attitudes and economic failure

Risk groups	Action on financial problem		
	Sequestration	Sold farm	Rented farm out
Averters	1	3	1
Neutral	2	-	1
Seekers	5	-	-
Total	8	3	2

The risk neutral farmers planted significantly more maize than the risk averse and risk seeking farmers and they are less experienced. This is a direct result of the pricing policy of the Maize Board followed at that stage. One of the objectives of the one channel marketing scheme was to fix prices to reduce risks. The dairy enterprise is most prominent among the risk averse group. This was to be expected, as this is one of the few agricultural enterprises with a relatively stable monthly income. The return on own capital indicates that, like any other input, risk can also be managed inefficiently. The risk averters and seekers have different attitudes towards risk. It is, however, clear that the risk neutral group is in a better position than both averters and seekers with respect to both return on own and total capital.

The diversification strategies of the different risk groups are not significantly different, neither is a higher level of diversification associated with risk averters. This is due to the fact that both risk averters and risk seekers diversify in this region, but for different reasons. Some types of diversification are implemented solely to make the greatest profit without concern for variability in prices and yields and the risk associated with it. However, diversification can also be implemented purely to reduce risk. Sometimes profits will be higher with specialization in a single crop but two or three crops may be produced just to reduce risk of very low incomes in specific years. On other farms, the best organization may call for one main enterprise, a complementary enterprise and supplementary enterprises: diversification already exists as a means of using resources more efficiently and in making higher profits.

Diversification to reduce uncertainty, like all other precautions to lessen the impact of unknown outcomes, comes at a cost. The cost is the income sacrificed over a period of years by organizing the farm to reduce the variability of income between years. Diversification to reduce risks usually means that income never falls as low in bad years and never is as high in good years as could have been the case. Again the choice must be that of the individual, depending on his financial position, his family responsibilities and his general ability to shoulder risks. If he has a good credit position, he may choose a higher return, variable alternative and carry cash reserves forward from poor to good years; or he may use credit during bad years and repay it in lush years. If his debt load is at a maximum and debt payments are due each year, he may select the more stable alternative even though it gives somewhat less income.

Diversification considerations can include attempts to either (1) put a floor under income, or (2) level off the variations in income. To put a floor under income, the manager selects a stable enterprise to give some profit every year. Dairying or a small tract of irrigated crops serve this purpose. Then he selects the prospectively high return enterprise even though it does involve considerable risks. The goal is to get offsetting enterprises. If enterprises are to offset each other for income variations, they must possess certain characteristics: their prices and yields should have as little positive correlation or association, as is possible. Diversification is not very effective in reducing variations in income for major changes in farm prices. Price correlations are positive (move in the same direction) over periods of any length. The same can be said of enterprises affected by drought.

The 13 farmers in the survey who left farming due to financial reasons had different risk attitudes in 1981. This partly led to their failures during the following decade. Table 3 indicates why the farmers left farming and what their risk attitudes were in 1981.

Of the 13 economic failures, equal percentages (38,46%) were risk seekers and risk averters, while 23% were risk neutral. This is in accordance with Van Zyl (1989) and De Jager and Van Zyl (1991) who showed that any excessive action is undesirable. A compulsive risk averter rarely accepts opportunities or challenges; he very reluctantly, if ever, accepts new practises and is rarely a successful entrepreneur. A compulsive risk seeker, on the other hand, gambles with his business to such an extent that it will inevitably be ruined. The focus should be on the maximisation of opportunities, not the minimisation of risks. It is important to determine which opportunities and risks suit the business and which do not.

5. Conclusion

This study showed that the level of diversification is not correlated to farmer's attitude towards risk. Diversification is sometimes carried out solely to make larger profits without concern for variability in prices and yields and the risk associated with it. However, diversification can also be implemented purely to reduce risk. Earning income from non- farming ventures is also a way to diversify. This study indicates that some farmers apply this to reduce their risk.

In South Africa, there are many examples of diversified ventures which are also compatible with the existing farming system. Farmers should be perfectly capable of doing market research, assembling needed resources, learning and handling new skills and getting ventures going after all administrative work and constraints have been adressed. The opportunities are there and the incentive and premiums which are offered are large enough so that they are encouraged to take these chances. The difficult decision may ironically lie in resisting the opportunity if diversification is not a viable proposition, as there are situations where no suitable diversification opportunity exists. Any excessive attitude regarding risk is undesirable.

From the foregoing it may be deduced that diversification strategies should therefore satisfy two conditions namely:

- The variance, or standard deviation, in gross margin or profit should be small enough in a specific strategy to ensure that losses in less favourable years, and thus interest and loan obligations, are limited.
- Expected gross margin or profit per hectare should be large enough to ensure that sufficient funds are generated to compete with other strategies.

Liquidity considerations also affect the optimal diversification strategy. This is in accordance with Van Zyl and Groenewald (1986), who indicated that a farmer with liquidity problems should follow a more conservative strategy with a higher expected yield and at the same time a higher probability of a loss only in years without liquidity problems.

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