

Influence of Farm Characteristics on Financial Portfolio Diversification among Commercial Sugarcane Farmers in Bungoma and Kakamega Counties, Kenya

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Abstract

The main purpose of this study was to analyse the relationship between farm characteristics and financial portfolio diversification among sugarcane farmers in Bungoma and Kakamega Counties in Kenya. Descriptive correlation was used to describe and establish the relationships among the study variables. The target population for this study comprised of all sugarcane farmers around Kakamega and Bungoma Counties. Both primary and secondary data was used in this study and the positivistic approach to research guided data analysis will be used for the study. The study variables were measured using both the ordinal scale and summated scale (likert-type scale). The questionnaire was pre-tested on pilot respondents who were not be part of the study respondents but knowledgeable in the study aspects in order to ensure their validity and relevance. Cronbach's alpha coefficient was used to measure the reliability of the scale. The relationship between return on investment of farm characteristics which was the dependent variable of the study and portfolio diversification was assessed using Pearson product moment correlation. The study found out that there was a positive correlation between contracting farmers secures farm funding and financial portfolio diversification which was statistically significant ($r = .468$, $p < 0.05$). The regression results revealed that farm characteristics had overall significant positive relationship with the financial portfolio diversification among commercial sugarcane farmers in Kenya ($\beta = 0.204$, $p\text{-value} = 0.012$). The hypothesis criteria was that the null hypothesis H_{04} should be rejected if $\beta \neq 0$ and $p\text{-value} \leq \alpha$ otherwise fail to reject H_{04} if the $p\text{-value} > \alpha$. From the above regression results, $\beta \neq 0$ and $p\text{-value} < 0.05$, hence the study therefore rejected the null hypothesis since $\beta \neq 0$ and $p\text{-value} \leq \alpha$ and concludes that farm characteristics affected financial portfolio diversification among commercial sugarcane farmers in Kenya.

Acknowledgment

To my fellow researchers, Prof. Gregory Namusonge, Prof. G.Namusonge, Dr. Otieno, Dr. Mugambi, Dr. M.Sakwa, Dr. Waka: I convey my special acknowledgment to my family and I thank my beloved parents and family whose prayers and encouragements have never departed from me ever since. May God richly bless you all, for directly or indirectly contributing to the success of this academic work. I am also grateful to the entire Mount Kenya university fraternity for giving me the opportunity to work in this institution.

Key Words: Farm Characteristics, Financial Portfolio Diversification, Commercial Sugarcane Farmers, Kenya

1.1 Background to the study

Net farm income is highly variable from year to year, and is closely tied to the size and efficiency of the operation. It also depends on the amount of debt the farm is carrying. The rate of return on farm assets is quite variable, too, but average long-term rates of 6 to 10 percent have been common. The average rate of return on farm equity measures how fast farm net worth is growing, excluding changes in land and machinery values. Highly leveraged farms may earn little or no return on equity when interest rates are high. On the other hand, if the farm's overall return on assets is higher than the cost of borrowed money, the return on equity may be quite high and net worth will grow rapidly. Operating profit margin is equal to the shilling return to capital divided by the value of farm production each year. Ratios have averaged about 25 to 30 percent in recent years. High profit farms have had ratios of 35 percent or more, while low profit farms have had ratios of less than 15 percent. Farms that hire or rent assets such as labor, land, or machinery will have a lower operating profit margin because operating costs are higher. However, they will usually generate a larger gross and net income. Farms with owned or crop share rented land will have a higher operating profit margin because they have lower operating expenses.

Profitability refers to the difference between income and expenses. One important measure of profitability is net farm income. Annual rates of return on both equity capital and total assets also can be calculated and compared to interest rates for loans or rates of return from alternative investments. Financial efficiency ratios show what percent of gross farm revenue went to pay interest, operating expenses, and depreciation, and how much was left for net farm income. The asset turnover ratio measures how much gross income was generated for each dollar

invested in land, livestock, equipment, and other assets. Asset turnover ratios for typical farms are about 30 to 40 percent, but they can range from 20 to 30 percent for low profit farms and up to 40 to 50 percent for high profit farms. The asset turnover ratio measures the efficient use of investment capital while the operating profit margin ratio measures the efficient use of operating capital. Because they are substitutes for each other (owned and rented land, for example), farms that are high in one measure may be low in the other.

Repayment capacity measures show the degree to which cash generated from the farm and other sources will be sufficient to pay principal and interest payments as they come due. The farm record data that was available did not contain enough information to calculate historical repayment capacity measures. However, the term debt coverage ratio should at least be great than 1.0, and the capital debt repayment margin should be large enough to cover any possible shortfalls in cash flow that cannot be paid from savings or other sources of short-term liquidity. If comparisons show that a farm's financial performance is below average, further analysis should be done to determine the sources of the problem. Areas of possible concern are production efficiency, marketing, purchasing of inputs, and the scale of the operation in relation to the size of the work force. Enterprise analysis and production records can help identify problems that contribute to poor financial performance. (Plastina, 2013) Prior studies have shown a close relationship between the use of debt financing and the profitability of the small and medium size enterprises. According to Buthiewez and Yanikkaya (2008) in a study on the effects of debt financing from IMF, they determined that IMF lending stimulates the growth and performance of SMEs. Currently, the contributions of the SMEs are so significant and have been recognized by many governments which are now including them in their development plans. This also includes support services and funding at lower interests.

1.2 Statement of the problem

Households seek to generate a portfolio of income with different degrees of risk, expected returns, liquidity and seasonality. Farmers are thus allocating different household resources at their disposal to different income generating activities and farmers are giving attention to more than one major activity aimed at not only stabilizing but also increasing and maximizing farm income. (Andrew, 2009)

M Dlamini (2010) identified numerous assets that determine sugarcane profitability. These include: farm assets; closely monitoring labor as far as planting, weeding, irrigation, fertilizer application and harvesting is concerned. He also confirmed that under-utilizing labor affects the overall profitability and identified agronomic factors such as varieties planted, soil fertility, system of irrigation and planting time as determinant of sugarcane investments in financial performance. Masaku (2011) provided considerable insights regarding farm financial assets affecting sugarcane investments financial performances. These include yield per ha, farmers experience, sucrose content in the sugarcane, change in production quota of the farmers and the distance between farm and the mill.

A comparative performance of the sugar industry by the Kenya sugar Board (2012:2013) shows that the sugar industry recorded an 8.3% decrease in sugar production during the period January-March 2013 compared to the same quarter last year. Total sales for the quarter were 135,610 tons against 143,077 tons in the same period 2012, a decrease of 5.2%. The quarter ended with closing stock of 14,658 tons against 21,726 tons in the same period last year. Total area under cane as at the end of March 2013 was 180,912 hectares compared to 206,809 hectares in the same period last year, a decrease of 14%. An analysis by Kenya National Bureau of statistics (2007) on the major sources of household income showed that households derived the highest proportion of their income from employment and labor (47.65%) and non-farm enterprises (36.60%). This is an indicator that households rely to higher extent on non-farm sources of income than on farm sources. The other sources contributed a small proportion of the total income and these were crops (7.21%), livestock (6.50%) and other (2.04%). The category of income labeled as others was composed of minor sources of income such as gifts, donations, shares in cooperatives and remittances. This means that the non-farm assets and financial assets are also more important to the households in terms of income contribution and investment diversification.

Farm diversification is common to rural landowners across the developing world. In Kenya, diversification is being promoted as a system to build economic resilience for farming families. Diversification is an addition of another stream of farm-based income to supplement the existing source/s. Over time, the diversification enterprise may overtake and replace the original core business (Andrew, 2009). It is against this background that this study analyzed the relationship between farm characteristics and financial portfolio diversification among commercial sugarcane farmers in Kenya.

1.3 Objective of the study

The objective of the study was to establish the influence of farm characteristics on financial portfolio

diversification among commercial sugarcane farmers in Kenya.

1.4 Hypothesis of the Study

H₀: Farm characteristics affect the level of financial portfolio diversification among sugarcane growing farmers in Kenya.

2.1 Literature Review

Farm size, farm experience and contract farming are some of the farm characteristics known to influence financial portfolio diversification of sugarcane farmers. The size of the farm generally has a positive effect on the decision of a farmer on whether to diversify their investments or not. It is assumed that households with larger cultivated tracts of land have the ability to diversify their portfolio as compared to their counterparts with smaller tracts of land.

Interest by agricultural economists in farm diversification is evident in published research. Since the early works of Markowitz and Heady, attention has focused mainly on mean-variance portfolio approaches. These studies generally focus on the normative issue of optimal diversification under uncertainty. The fundamental reasons why farmers diversify is that the relationship between diversification and farm size is an indicator of trade-offs between risk reduction and possible economies so size in a particular activity. That is if there are substantial economies of scale in a particular activity one clearly gives up a large expected return in order to ensure against risk through diversification. (Pope & Prescott, 2006) The size of the farm has an effect on the profitability of the enterprise because farmers with a small farm may produce a good yield only to find that his returns are lower, owing to costs incurred as a result of economies of size.

The number of years a farmers' association has been involved in sugarcane farming is a proxy of the management capability of the association. It is expected to have an influence in the farmers' associations' management skills as well as improved interaction with the mill where they deliver their sugarcane. Through the interaction, the farmers may develop some confidence in sugarcane farming by applying the required management expertise to produce a good crop. Thus, farmers who had been involved in the sugarcane farming for several years are expected to perform better than relatively new farmers. Therefore, a positive relationship is expected between farming experience and profit per hectare. (Dlamini & Masuku, 2012)

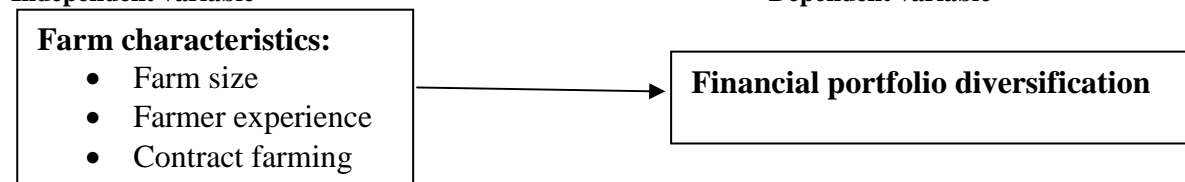
In contract farming, the buyer and the producer commit in advance to exchange the product. In addition, in most cases, the buyer provides credit, monitoring, or is directly involved in part of the production process. The need for steady supply of raw material, the scope for the buyer to provide in-kind loans, and the presence of increasing returns in some of the cultivation or post-harvesting tasks are among the major factors thought to affect the emergence and the success of contract farming schemes. (Lorenzo, Michael, & Sendhil, 2012)

Contract farming is defined as "an agreement between farmers and processing and/or marketing firms for the production and supply of agricultural products under forward agreements, frequently at predetermined prices" (Eaton and Shepherd, 2001). In addition, the large majority of these schemes include the provision of inputs and some form of production monitoring. Eaton and Shepherd also identify five main typologies of contract farming, primarily based on the number of contractors. Another important distinction across schemes is based on the price setting mechanism. In "fixed price contracts", the contracts specify in advance the price producers will receive at harvest. In "formula price contracts", a pre-determined formula determines the price received by farmers' using the current market price as a starting point, and factoring in the costs and the interest on the inputs provided by the buyer during the production process. With the dismantling of marketing boards and the liberalization of agricultural markets, the prevalence of contract farming schemes has been steadily increasing throughout the developing world, including Africa (Porter and Phillips-Howard, 1997). In Kenya, the country we focus on this paper, Grosh (1994) reports an increase in the share of contracted crops over the total value of marketed crops from 22% in 1964 to 45-50% in the mid-1980s.

According to Waswa *et al* (2012), contracted cane farmers supply 90% of the total sugar cane to the Kenyan sugar factories. The majority of these are small-scale growers, whilst the remaining is supplied by factories Nucleus Estates. Therefore contracted cane farmers are an important entity in sugarcane production. MSC being a large-scale organization operates under a bureaucratic form of structures. The farmer and the company have each management obligations that affect sugarcane production; therefore the researcher investigated the managerial factors (functions) that influenced sugar cane production by contracted sugarcane farmers. The study assumes that portfolio diversification is directly affected by some characteristics of the farmer return on investment. The study is also based on the assumption that these characteristics will either push the farmer to diversify more or lesser. It is on this view that the study formulated the following null hypothesis:

The conceptual Framework

Independent variable



3.1 Methodology and Design

A research design refers to the overall strategy that you choose to integrate the different components of the study in a coherent and logical way, thereby, ensuring you will effectively address the research problem; it constitutes the blueprint for the collection, measurement, and analysis of data (Sakaran, 2003). This study was a survey research design as the research involved collecting data as reported by individuals. The data was then described and further correlated to create a snap shot of the current state of affairs and to establish and describe the relationships among two or more study variables. Descriptive research design allows the researcher to evaluate and describe the relationship between the study variables which are associated with the problem. Correlational design also allows a researcher to measure the research variables by asking questions to the respondents and then examining their relationship (O'Connor, 2011). Therefore the study was descriptive correlational study. Descriptive was chosen because it provides a relatively complete picture of what is occurring at a given time and allowed the development of questions for further study while correlational research design allowed testing of expected relationships between and among variables, making predictions and can assess these relationships in everyday life events.

3.2 Study Area

The study was carried out in Bungoma and Kakamega Counties. Sugar cane farming supports directly or indirectly over five million people in Kenya (KSB, 2012). The challenges faced by Kenya sugar industry are inefficient production processes, accumulated debt, and stiff competition from low cost producers and high cost of production. These issues push the farmers to seek the addition of another source of farm-based income to the existing income stream (Mumias sugar, 2007) hence the need to carry out the study in this area. The proximity to the researcher is another reason as to why this area was chosen; this allowed the researcher to conduct the research adequately and within the stipulated time period.

3.3 Population

The target population for this study comprised of all sugarcane farmers around Kakamega and Bungoma Counties. The farmers were preferred because they are likely to exhibit elaborate relationships between the study variables since they are highly knowledgeable about the farming activities related with the crop and the environment in which the crop is grown.

The population of the study was 2,039,645. *KNBS (2012)*

3.4 Data collection instrument

According to Mugenda, (2003) data collection instruments are the tools that assist the researcher in the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes. For this study, the researcher will use questionnaires. The questionnaires have both open-ended and closed-ended, and were divided into three parts. Part I contains general information of the respondent, part II contains questions on Return On Investment and lastly part II contains questions on financial portfolio diversification.

3.5 Pilot Study

In order to ensure content validity of the research instrument, the preliminary questionnaire was pre-tested on a pilot set of respondent for comprehension, logic and relevance. Respondents in the pre-test were drawn from a section of Sugarcane growers in Kakamega County which will be similar to those in the actual study in terms of background characteristics. The respondents on which the pre-testing was done was not be part of the target population of study. 30 farmers randomly selected were used in the pilot study.

3.5.1 Validity of research instrument

All the aspects of the questionnaire were pre-tested including question content, wording, sequence, question

difficulty, layout and form and instructions. The feedback obtained was used to revise the questionnaire before administering it to the study respondents. Both the questionnaire and the measurement process was guided by the conceptual framework in order to measure the key elements of ROI and financial portfolio diversification and ensure construct validity because they reflect the key components of the study variables.

3.5.2 Reliability of Research Instrument

Reliability on the other hand refers to the measure of the degree to which a research instrument yields consistent results on across time and across the various items of the instrument (Sekaran, 2003). Reliability is the extent to which an instrument is predictable, stable, accurate and dependable to yield the same results every time it is administered. Cronbach's alpha coefficient was used to measure the reliability of the scale, which was also used to assess the interval consistency among the research instrument items. This is because it is strong in determining the inter consistency or average correlation of items in a survey instrument to gauge its reliability (Santos, 1999).

3.6 Data analysis and presentation

The positivistic approach to research guided data analysis was used for the study. Positivism advocates for hypothesis testing using quantitative techniques (Stiles, 2003). The data followed Sekaran, (2003) four step process of data analysis; getting data ready for analysis which involves getting a feel of the data, testing the goodness of the data and testing the hypothesis. The data was subjected into factor analysis in order to determine the suitability of the data for regression analysis. According to Kothari (2010), factor analysis is a useful tool for investigating variable relationships for complex concepts such as socioeconomic status, dietary patterns, or psychological scales. It allows researchers to investigate concepts that are not easily measured directly by collapsing a large number of variables into a few interpretable underlying factors. Descriptive statistics was used to obtain a general understanding of the respondents' characteristics. Both parametric and non-parametric tests were done depending on measurement scale. In an effort to establish the suitability of the data for regression analysis by ensuring that the dependent and independent variables have a statistically significant relationship while at the same time controlling for multicollinearity problem which occurs if any two independent variables are highly correlated (Cooper & Schindler, 2005), correlation analysis was used to measure the strength of the relationship between financial returns on investments and financial portfolio diversification.

The relationship between return on investment of farm characteristics and financial portfolio diversification was expected to follow the multiple linear regression models as follows:

$$Y = \beta_0 + \beta_1 X_1$$

Where:

- Y = Dependent variable (household portfolio diversification).
- β_0 = Constant or intercept which is the value of dependent variable when All the independent variables are zero.
- β_1 = Regression coefficient for each independent variable.
- ε = The slandered error term random- variation due to other unmeasured factors.
- X_1 = Return on investment of farm characteristics

4.1 Response level, Data coding and Cleaning

Although the study had intended to collect data from a sample of 399 Households, the researcher managed to successfully collect data from 320 of them. This represents a response rate of 80 percent of the target population and the researcher considered the response rate good enough. The data was then coded and cleaned through extensive checks for consistency. Data was analyzed using a set of descriptive and inferential statistics in statistical package for social sciences (SPSS) version 12.0 software.

4.1 Descriptive Study Results

The return on investment of farm characteristics was assessed by six measures. Table 4.1 presents the relevant result which shows that on the scale of 1 to 5 (where 5= the greatest extent and 1is the lowest extent).

Most the household return on investment of farm characteristics are to great extent correlated with sugarcane contact farming is the best if you are to get ability to get funds for other investments (Mean 4.150) and also Sugarcane contact farming enables profit oriented sugarcane investments (mean 4.100). However, contracting enables one to acquire security for other types of investments (mean 3.400) and my big farm enables me to earn reasonable profits (mean3.700) were moderate. Overall, the intensity of return on investment of farm characteristics was considerably high (mean 3.808).

The results reveal that at one-sample t-test comparison of the financial return on investment of farm characteristics mean score indicates differences that were all statistically significant. The extent of return on investment of farm characteristics varied from one household to another. My farm size is big enough to enable me earn sufficient profits (t-test = 42.684, p-value < 0.05) and it was followed by my big farm enables me to

earn reasonable profits (t-value=39.814, p-value < 0.05). On the other hand, the lowest difference was reported in I have a long experience in farming sugarcane which makes it always profitable (t-value=26.292, p-value < 0.05) followed by with some experience sugarcane farming is profitable (t-value=26.321, p-value < 0.05).

Table 4.1 Financial Return on Investment of Farm Characteristics

ROI of Farm Characteristics Measures	N	Mean	Std. Deviation	t-value	Significance (P-value)
My big farm enables me to earn reasonable profits	320	3.700	.842	42.684	0.000
My farm is big enough that its revenue supports my needs	320	3.750	.766	39.814	0.000
I have a long experience in farming sugarcane which makes it always profitable	320	3.750	.829	33.452	0.000
Contracting enables one to acquire security for other types of investments	320	3.400	.860	26.292	0.000
Sugarcane contact farming is the best if you are to get ability to get funds for other investments	320	4.150	.726	26..321	0.000
Sugarcane contact farming enables profit oriented sugarcane investments	320	4.100	.830	27.374	0.000

4.2.2 Factor analysis for Farm Characteristics

From the results, KMO has an index of 0.56. From the study results, the Bartlett's Test of Sphericity has p-value of 0.000 which is less than the stated $\alpha = 0.05$, implying that the test is highly significant; hence the factor analysis is appropriate.

Table 4.2 Results of Factor Analysis for Financial ROI of Farm Characteristics

Component Matrix(a)

	Component	
	Contracting farmers secures farm funding	Farm size relate to profitability
My big farm enables me to earn reasonable profits		.564
My farm is big enough that its revenue supports my needs		.602
I have a long experience in farming sugarcane which makes it always profitable		.874
Contracting enables one to acquire security for other types of investments	.895	
Sugarcane contact farming is the best if you are to get ability to get funds for other investments	.924	
Sugarcane contact farming enables profit oriented sugarcane investments	.948	
Overall Mean	3.883	3.733
Cronbach's Alpha	0.938	0.789

Extraction Method: Principal Component Analysis.
 a 2 components extracted.

From the study results, farm size relate to profitability accounts for 50.771% and 26.146% respectively of the total variance. Cumulatively, 76.917% of the variance is accounted for by the two factors. From the study results, the system has identified the two as important factors to be loaded in the analysis. From the rotated matrix, factor one (farm size relate to profitability) has is highly and positively correlated with sugarcane contact farming enables profit oriented sugarcane investments (0.948). However, I have a long experience in farming sugarcane which makes it always profitable with factor two (0.874). The overall correlation between the indicator of Farm size relate was 0.680 and Contracting farmers secures farm funding was 0.922.

The measures of return on investment of farm characteristics were subjected into the reliability test using Cronbach's alpha coefficient and were found to have Cronbach's alpha coefficient of 0.738 hence considered to be reliable in that they all had alpha coefficient greater than the minimum accepted Cronbach's alpha coefficient of 0.70.

Table 4.3 Overall significance ANOVA (F-test) (Contracting farmers secures farm funding)

Model		Sum of Squares	Degree of Freedom	Mean Square	F	Sign. (P-value)
Contracting farmers secures farm funding	Regression	1.362	4	1.362	1.621	0.008
	Residual	5.351	316	0.334		
	Total	6.713	320			
Farm size relate to profitability	Regression	1.081	5	1.018	2.162	0.024
	Residual	2.230	315	0.216		
	Total	3.311	320			

Predictors: (Constant): Age

The ANOVA results shows that on overall significance, there is a statistically significant relationship between age and contracting farmers secures farm funding because the p-value is less than the set value of 0.05 (p – value = 0.008) while the relationship between age and Farm size relate to profitability was also statistically significant (p-value=0.024) .

4.2.3 Correlation between Farm Characteristics and Portfolio Diversification

The relationship between return on investment of farm characteristics which was the dependent variable of the study and portfolio diversification was assessed using Pearson product moment correlation. As shown in Table 4.18 below, there is a positive correlation between farm size relate to profitability and financial portfolio diversification which was statistically significant ($r = .638$, $p < 0.05$). On the other hand, there is a positive correlation between contracting farmers secures farm funding and financial portfolio diversification which was statistically significant ($r = .468$, $p < 0.05$). The research findings also show that there is a positive relationship between all the measures of farm characteristics and portfolio diversification and the other measures had positive and significant relationship among themselves.

Table 4.4: Correlation between Farm Characteristics and Financial Portfolio Diversification

Scale	1	2	3
1 Financial Portfolio diversification	1		
2 Farm size relate to profitability	.638*	1	
3 Contracting farmers secures farm funding	.468*	.442*	1

*Correlation is significant at the 0.05 level (2-tailed).

4.2.4 Regression Analysis for Farm Characteristics and Financial Portfolio Diversification

To assess the level of significance of the relationship between farm characteristics and financial household portfolio diversification among commercial sugarcane farmers in Kenya, the study formulated the following null hypothesis;

H_0 : Farm characteristics do not have a significant relationship with financial portfolio diversification among commercial sugarcane farmers in Kenya.

The null hypothesis (H_0) tested the direct relationship between Farm characteristics and financial portfolio diversification among commercial sugarcane farmers in Kenya using aggregate mean scores. The measures of financial portfolio diversification mean scores were regressed against those of farm characteristics measures and the relevant research findings are presented in Table 4.5.

Table 4.5 Regresion Results of Financial Portfolio Diversification against Farm Characteristics Goodness Fit Analysis: Model Summary(b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.204(a)	.163	.046	.83466

a Predictors: (Constant), Farm characteristics

b Dependent Variable: Financial Portfolio diversification

Overall significance, ANOVA(b)

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.543	1	.543	.779	.012(a)
	Residual	2.787	316	.697		
	Total	3.329	320			

a Predictors: (Constant), Farm size relate to profitability, Contracting farmers secures farm funding
 b Dependent Variable: Financial Portfolio diversification

Individual significance (T-test): Coefficients(a)

Model		Unstandardized		Standardized		
		Coefficients		Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	4.016	5.120		1.565	.193
	Farm size relate to profitability	1.184	1.342	.204	.883	.042
	Contracting farmers secures farm funding	0.365	0.779	0.266	2.289	0.028

a Dependent Variable: Financial Portfolio diversification

- Lever of significance, $\alpha = 0.05$

From the Table 4.5, the regression results reveal that farm characteristics had overall significant positive relationship with the financial portfolio diversification among commercial sugarcane farmers in Kenya ($\beta = 0.204$, p-value = 0.012). The hypothesis criteria was that the null hypothesis H_{04} should be rejected if $\beta \neq 0$ and p-value $\leq \alpha$ otherwise fail to reject H_{04} if the p-value $> \alpha$. From the above regression results, $\beta \neq 0$ and p-value < 0.05 , hence the study therefore rejects the null hypothesis since $\beta \neq 0$ and p-value $\leq \alpha$ and concludes that farm characteristics affected financial portfolio diversification among commercial sugarcane farmers in Kenya. The study results show that at the individual level, all the indicators of Farm characteristics relate to profitability and contracting farmers secures farm funding had positive and significant effect on financial portfolio diversification as follows: Farm size relate to profitability had positively influenced on financial portfolio diversification ($\beta = 0.204$ and p-value = 0.042) while contracting farmers secures farm funding also positively affected financial portfolio diversification ($\beta = 0.266$, p-value = 0.028).

Arising from the research results in Table 4.5, the resulting regression model that predicts the level of financial portfolio diversification (PD) for a given level of farm characteristics (FC) is stated as follows:

$$PD = 2.681 + 0.204FS + 0.266CF$$

Where: 2.681 = y-intercept constant, PD = household portfolio diversification, 0.204= an estimate of the expected increase in financial portfolio diversification corresponding to an increase in use of farm size relate to profitability and contracting farmers secures farm funding. The regression results also shows that 16.1 percent of the portfolio diversification can be explained by farm characteristics (R square = 0.161).

5.1 Summary of the Findings

The study found out that farm characteristics had overall significant positive relationship with the financial portfolio diversification among commercial sugarcane farmers in Kenya ($\beta = 0.204$, p-value = 0.012). The study results show that at the individual level, all the indicators of farm characteristics relate to profitability and contracting farmers secures farm funding had positive and significant effect on financial portfolio diversification as follows: Farm size relate to profitability had positively influenced on financial portfolio diversification ($\beta = 0.204$ and p-value = 0.042) while contracting farmers secures farm funding also positively affected financial portfolio diversification ($\beta = 0.266$, p-value = 0.028).

5.2 Conclusions

Farm characteristics had overall significant positive relationship with the financial portfolio diversification among commercial sugarcane farmers in Kenya ($\beta = 0.204$, p-value = 0.012) hence the study concludes that commercial sugarcane farmers in Kenya need to improve on their farm characteristics because it has been found by this study to have a positive and significant effect on portfolio diversification of commercial sugarcane farmers in Kenya.

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