International Journal of Science and Technology Research Archive

ISSN: 0799-6632 (Online)

Journal homepage: https://sciresjournals.com/ijstra/

(RESEARCH ARTICLE)

Check for updates

Factors influencing trader's participation in small scale hides and skin business in the leather value chain, among non-pastoralist

Ruth Mwenje Lumarai *, George Owuor and Edith Gathungu

Department of Agricultural Economics and Agribusiness Management, Egerton University, P.O Box 536-20115, Egerton. Kenya.

International Journal of Science and Technology Research Archive, 2023, 04(01), 210–221

Publication history: Received on 15 January 2023; revised on 26 February 2023; accepted on 01 March 2023

Article DOI: https://doi.org/10.53771/ijstra.2023.4.1.0037

Abstract

Hides and skin, the by-product from cattle and small ruminants (livestock production) forms an important business from the meat industry. Through value addition, the hides and skin are processed to leather. It is the main economic activity in both high potential, Arid and Semi-Arid regions and on small scale in other regions of Kenya. The objectives of this study were to determine the development and sustainability of the leather sector among the non-pastoralist communities. The study was carried out in Nakuru County (0.4254° S, 36.0023° E). Purposive random sampling technique of 100 respondents drawn from 10 sub-counties was used. Both primary and secondary data were used. Key informant interviews and percentiles were used to determine the challenges facing traders in the hides and skin industry. The multinomial logit model was used to determine the factors influencing the participation of the hides and skin traders in the leather sector and combination of the Gross Margin (GM) and the Endogenous Switching Regression (ESR) model to evaluate the impact of the hides and skin business to the income of traders. The main challenge that affects hides and skin traders is fluctuating prices at 56% and the lowest being poor condition of their working premise at 2%. This is a type of business that is passed on from one generation to another because most traders are middle aged or elderly (>45 years old). 35% indicated that their main reason for starting the business was family and had over 10 years' experience. The study also showed that ownership of registered business earns more income by $18 and on the contrary a reduction of income by $54. In conclusion proper utilization of hides and skin will not only earn income to the traders but will also minimize on wastage of a useful resource which is by-product from livestock industry that supports a valuable leather industry.

Keywords: Participation; Middle men; Owners of registered premise; Small scale; Income

1 Introduction

Hides and skin business forms part of the leather value chain and it derives its raw material from animal production in the Agricultural Sector (Mattila and Memedovic, 2008). The main products sold in this business include, hide which are mainly from big animals such as cows, camel and donkeys while skin are obtained from small animals such as goats and sheep (Ministry of Agriculture, Livestock and Fisheries (MoLF), 2015). Globally, China is the leading supplier of the leather footwear market and accounts for 63.7% while Asia is the leading consumer of leather products (United Nations Industrial Development Organization, , 2010). Even though African countries have a 5th livestock which accounts for 21% of the world's livestock population (Mwinyihija, 2015), they only account 4% of world leather production and 33% value addition in leather. For the last 2 decades, Kenya has been the third largest livestock holder in Africa and it has been a net exporter of meat as well as hides and skins. Although it served as a leather footwear hub for East Africa two decades ago, it is currently a very minor exporter of leather and leather products with 0.14% as at 2013, (Mwinyihija, 2009). The demand for leather products is growing faster than its supply and in Kenya and the performance has greatly declined from what it was in the 1990's, (World Bank Group and Economic Transformation Group, (2015)). This leather

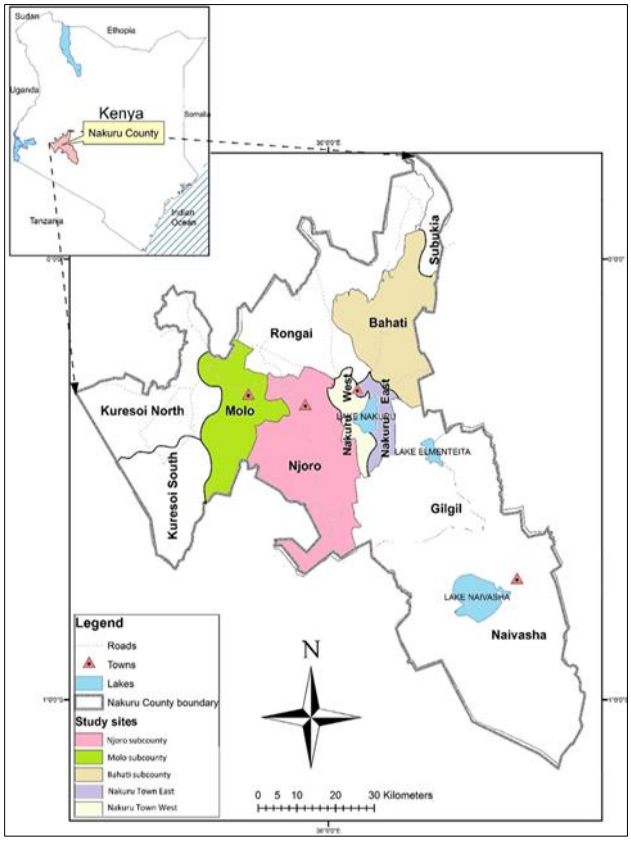
* Corresponding author: Ruth Mwenje Lumarai; Email: mwenjeruth@gmail.com

market is divided into: Primary markets which is characterized by livestock traders, butchers and the local buying group, Secondary markets which consists of main collection centers characterized by hides and skins traders and Tertiary market which is the highest market level that is characterized by exporters, tanners and major buyers in urbanized localities, (Mwinyihija, 2010). The middle men and owners of registered Premises form part of the local buying group and they mainly deal in raw, salted dried hides. The objectives of this study were to determine the development and sustainability of the leather sector among the non-pastoralist communities by focusing on the challenges facing the traders in the industry, factors influencing the trader's participation in the industry and the impact of the hides and skin business on the income of the trader

2 Material and methods

2.1 Study Area

The research was conducted in Nakuru County (0.4254° S, 36.0023° E) in the Central Rift Valley of Kenya and this was considered as a representative of other areas that produce hides and skin under small scale category. Most studies have been done in the pastoralists regions which produce hides and skin on large scale forgetting that consumption of meat is done everywhere and hence providing useful raw materials for the leather industry in Kenya. Consideration of such areas will minimize on wastage of this useful resource and will add extra income to the stakeholders.



Source: Virtual Kenya and Google Earth Pro. (2015)

Figure 1 Map of Nakuru County, Kenya

2.2 Theoretical framework

This study was based on Corporate Social Responsibility (CSR), (sustainable business practices) of the social contract theory which states that there should exist an implicit social contract between business and society and this contract implies some indirect obligations of business towards society (Omran, 2015). According to Dunfee, (2006), this theory suits an emerged economy where individuals are able to direct scarce resources to their highest valued use, the government is limited to its efficient ends, free-moving prices are allowed to signal the relative value of alternate uses for scarce resources without the distortion of taxes, the value of money is predictable and where private property rights and contracts between individual decision makers are enforced in an unbiased fashion.

Sustainability is one of the principles of CSR among accountability and transparency. A sustainable business is one that operates in the interest of all current and future stakeholders in a manner that ensures the long-term health and survival of the business and its associated economic, social and environmental systems (Schaltegger and Herzig , 2002). Since effects in which actions in this study are considered have on the options available in the future, then the utilization of the resources should not be more than what can be regenerated, this should not only be taken into account for measurement of costs and value created in the present but also for the future of the business itself. The leather sector in the country should therefore attain durable sustainability where there is efficient utilization of scarce resources in an optimal way, value addition through technology and innovation and the outputs of the industry to have distributional effects to all stakeholders (Crowther and Aras, 2008).

2.3 Determination of sample size

The study mainly targeted hides and skin traders who had been in the business for at least 2 years and a census of 100 traders was done contrary to the proposed sample size of 150 which was obtained using the formula described by Ali, (2014):

$$\boldsymbol{n} = \frac{\boldsymbol{pqZ^2}}{\boldsymbol{e^2}} \text{ ..... Eq (1)} \quad n = \frac{0.5 \times 0.5 \times 1.96^2}{0.08^2} = 150$$

Where n = Sample size; Z= standard deviation at a given confidence level (α=95%), p = proportion of the population containing the major interest q = 1-p e= allowable error. Since the proportion of the population is not known, p= 0.5, q=1-0.5=0.5, Z= 1.96 and e= 0.08

2.4 Participation of hides and skin traders

To determine the factors influencing the participation of the hides and skin traders in the leather sector, the logistic regression model was used instead of the probit model because the probit model has computational burdensomeness and weaker assumptions unlike the logistic regression model (Caliendo and Kopeinig, 2005) This model is the standard method for unordered, multi category dependent variables since it allows one to analyze data where participants are faced with more than two choices (Gujarati, 2012). In this study, it is therefore used to determine the factors that influence the choice of traders to participate in the hides and skin business. In this hides and skin marketing channel, if one decides to trade locally in hides and skin, he or she has two choices: the trader may decide to participate as a middleman or the trader may decide to have a registered premise dealing in hides and skin. Hence the following formula proposed by El- Habil, (2016) for the multiple binary logistic regression was used:

$$\pi = \frac{exp(\beta_0+\beta_1 x_1+\cdots..+\beta_{k-1}x_{k-1})}{1+exp(\beta_0+\beta_1 x_1+\cdots..+\beta_{k-1}x_{k-1})} \text{ ..... Eq (2)}$$

Where, π is the probability that a trader participates in the hides and skin business

x_1 to x_k denotes number of factors influencing the binary response Y (occupation of the hides and skin trader).

The choice to participate in the hides and skin business was based on maximization of the trader's utility subject to technical, socio-economic and institutional factors. Producers and traders who make their decision to participate or not in the market base their options that maximizes their utility (Onionkiton, 2014).

The trader decides on the marketing channel to use basing on the option to maximize utility subject to internal and external factors. If the costs that are associated with using a particular channel are greater than the benefits, the trader will be discouraged from using it thus shifts to the other option that will maximize their utility. Since the decision maker has incomplete information, uncertainty has to be taken into account making the utility to be modeled as a random variable in order to reflect the uncertainty (Greene and Hensher, 2009).

Table 1 Description of variables that were used in this model

Variable	Definition	Expected sign
Age	Traders actual age (years)	+
Gender	Traders gender (1=male; 0=female)	+/-
Marital status	The traders marital status	+
Education	Actual years of schooling (years)	+
Training	Training in the leather sector (1=yes; 0= no)	+
Experience	Experience in the hides and skin business (years)	+
Market information	Access to market information (1=yes; 0=no)	+
Market access	Access to markets (1=yes; 0=no)	+
Trans	Transportation of hides and skin to the tannery (1= trader; 0= buyer)	+/-
Market infra	Access to Market infrastructure (1= yes; 0= no)	+
Credit	Access to credit for the business (1= yes;0= no)	+
Storage	Access to storage facilities for collected hides and skin (1= yes; 0= no)	+
Legal fee	Amount of legal fee you pay to do the business (KES)	+/-
Policy	policies that affect your business (1= yes; 0= no)	+
Price	Average price of hides and skin KES	+
TR Business	Total Revenue from the business	+/-
TVC Incurred	Total variable cost incurred	+/-
GM	Gross margin from the business (KES)	+

2.5 Impact of the hides and skin business on the traders' income

A combination of Gross Margin (GM) analysis the Endogenous Switching Regression (ESR) models were used for the study.

2.5.1 Gross Margin Analysis

GM analysis was used to evaluate the profitability of the business and it was calculated as follows:

$$GM=TR-TVC \quad \text{.....Eq (3)}$$

Where GM – The average gross margin of the hides and skin business for the trader,

TR- The average total revenue of the hides and skin business for the trader, TVC – The average total variable cost incurred by the trader in the hides and skin business

The TR was the average monthly income of the maximum monthly income (average number of hides and skin collected per month in kg × the maximum price of selling a kg of hide or a piece of skin sold) and the minimum monthly income (the average number of hides and skin collected per month in kg × the minimum price of selling a kg of hide or a piece of skin).

2.6 Endogenous Switching Regression Model

The relationship between the outcome of participation (income) and a set of exogenous variable was estimated for the 2 types of traders.

The expected income that the trader received from participation in the hides and skin business was a latent variable determined by observable characteristics (X_i) and unobserved characteristics (ε_ij), the income equation is specified as:

$$Y_{ij}^{*}=X_i \beta_j+\varepsilon_{ij} \ldots\ldots\ldots\ldots\ldots\ldots\text{Eq (4)}$$

The base or reference category was non-participation in the hides and skin business is denoted as

j= 1, if the individual is not a trader in hides and skin, j= 2, if the individual is a middle man and j= 3, if the individual has a registered hides and skin premise hence the outcome equation for each of the possible choices is given as:

$$Y_{ij}=Z_i \alpha_j+U_{(ij)} \text{ if } I=j \ldots\ldots\ldots\ldots\ldots\ldots\text{Eq (5)}$$

where Y_ij , the outcome of the ith trader with the choice j is, Z_i was the set of exogenous variables, I was made to be the index of the j choices, α_j were the coefficients of the exogenous variables and U_(ij)the error terms distributed with E(U_ij/X,Z)=0 and var U_ij/X,Z=σ_j^2 the outcome (GM) only observed when the ith individual made one of the j choices which occurred when the utility derived from the choice made was greater than the other choice available. With the linearity assumption which involved the construction of the correlation between u's and ε's sums to zero the equation of the multinomial ESR in equation (6) was specified as:

$$Y_{ij}= Z_i \alpha_j+\sigma_j \lambda_j+\omega_{ij} \text{ if } I=j \ldots\ldots\ldots\ldots\ldots\ldots\text{Eq (6)}$$

Where σ_j was the covariance between ε's and u's, λ_j is the inverse Mills ratio computed from the estimated probabilities and ω_ij was the bootstrapped standard error to account for the heteroskedasticity arising from the generated regressor λ_j. This model was applied to produce selection-corrected predictions of counterfactual income using the Average Treatment Effect on the Treated (ATET).This method was used to evaluate the effect of the treatment "adoption of strategy" on the net revenues of the farm households that adopted strategy (Veronesi and Salvatore, 2012) and was used in the study to evaluate the effect of participation in the hides and skin business on the income of the two types of traders that participated in the business. The expected income of the traders that participated in the hides and skin business: j= 2, 3 with j= 1 for non-participants as the reference category was derived as:

$$〖(Y)〗_{i2} |I=2) = Z_i \alpha_2+\sigma_2 \lambda_2 \ldots\ldots\ldots\ldots\ldots\ldots \text{ Eq (7a)}$$

$$〖(Y)〗_{i3} |I=3) = Z_i \alpha_3+\sigma_3 \lambda_3 \ldots\ldots\ldots\ldots\ldots\ldots\text{Eq (7b)}$$

Thereafter, the expected income of the traders that participated in the business in the counterfactual hypothetical case that they did not participate (counterfactual) was derived as:

$$〖(Y)〗_{i1} |I=2) = Z_i \alpha_1+\sigma_1 \lambda_2 \ldots\ldots\ldots\ldots\ldots\ldots\text{Eq (8a)}$$

$$〖(Y)〗_{i1} |I=3) = Z_i \alpha_1+\sigma_1 \lambda_3 \ldots\ldots\ldots\ldots\ldots\ldots \text{ Eq (8b)}$$

The treatment effects for the middlemen and the owners of registered premises was therefore calculated as the difference between 7a, 8a and 7b, 8b respectively given as:

ATT for middlemen will be:

$$E〖(Y)〗_{i2} |I=2)-E〖(Y)〗_{i1} |I=2) =Z_i 〖(\alpha)〗_{2-\alpha_1)-\lambda_2 〖(\sigma)〗_{2-\sigma_1)} \ldots\ldots\ldots\ldots\ldots\ldots\text{Eq (9)}$$

ATT for owners of registered premises will be:

$$E〖(Y)〗_{i3} |I=3)-E〖(Y)〗_{i1} |I=3) =Z_i 〖(\alpha)〗_{3-\alpha_1)-\lambda_3 〖(\sigma)〗_{3-\sigma_1)} \ldots\ldots\ldots\ldots\ldots\ldots\text{Eq (10)}$$

Whereby, for the equations 7 and 8, the first term on the right-hand side represented the expected change in participants mean outcome, if the participants characteristics had the same return as non-participants while the second term (λ) is the selection term that captured all potential effects of difference in unobserved variables.

3 Results and discussion

3.1 Factors influencing participation of hides and skin traders in the leather industry

The factors that influence traders' participation in the leather industry are significant (TABLE 4). Age plays a key role in participation in this industry whereby majority of the traders were above 40 years because they are likely to have started participating in the business when they were in their late 20-30's when the industry was operating profitably within the country. This supports the study of Wanyoike et al. (2018) who stated that majority of hides and skin traders are middle aged or elderly >45 years and had been in the hides and skins collection business for over 10 years and worked with specific clients. The level of education also plays an important role in influencing the individuals to participate in the business whereby majority of the traders had secondary and primary education with only few (5%) who have attained tertiary education. This supports the study of Naporos, (2012), whose findings showed that majority of hides and skin traders are those who drop out of school at either primary or secondary level.

The ability to store hides and skin also plays a significant role in influencing the traders participation in the industry bearing in mind that this is a perishable commodity and without proper care it is likely to rot giving the traders losses. If one cannot preserve the hides and skin, the trader will opt to be a middleman hence sell the product within a day after acquisition but if one can own a storage facility and maintain it well, the trader will opt to be an owner of a registered premise in this value chain and preserve the hides and thus add value to it and staying with it longer before it is taken to the tannery. According to Jabbar et al. (2002), poor handling of hides and skin during storage may lead to further damage such as scratches and tearing, wetting and contamination and infestation by insects.

The traders pay legal fee to do business. This is a significant factor in influencing the individual's participation in the industry because if the amount they pay to the government is high they will not afford it hence will not be able to trade in hides and skin but if it is manageable they participate at different levels of the chain depending on their ability.

The amount of income accrued from the business influences their participation in the business whereby most of the traders were farmers and therefore engaged in hides and skin business which is less involving but helps them earn an extra income while those who had butchery businesses engaged in hides and skin business to earn an extra income by selling the by-products of the animals which they usually buy as a whole for meat. The gross margin has a significant influence on participation which was gotten by deducting the expenses that one incurred while doing the business from the total revenue earned. High revenue encourage trader to engage in the business while low revenue discourages trader from conducting business but is better than getting losses.

Comparison of price of hides and skin indicated that, the price of hide and sheep skin are the ones that greatly influence the traders' participation in the industry. The price of a hide ranges KES 10 to KES 50 per kg for an average weight of 25kgs for the hide that they usually get while the price of a sheep skin ranges KES 40 to KES 180 per sheep skin. The price of goat skin was not significant because within the county, the farmers majorly rare cows and sheep because the weather conditions favor their survival and therefore becoming a major source of meat and concurrently major source of hides and skin thus little trade in goat skin. According to the study of Wangui, (2016), a camel hide fetches the highest price in the market, followed by cattle hide then lastly both sheep skin and goat skin because of their differences in size and weight.

Table 2 Factors influencing participation of hides and skin traders in the leather industry

Factor	Odds ratio	Std. Err.	z	P>z	95%	Conf. interval
Gender	1.001	0.694	0.00	0.999	0.258	3.893
Age	0.962	0.021	-1.83	0.067	0.922	1.003**
Marriage	0.781	0.224	-0.86	0.389	0.446	1.370
Education	0.489	0.196	-1.79	0.074	0.223	1.071**
Training	1.898	1.196	1.02	0.309	0.552	6.526
Information	2.763	3.212	0.87	0.382	0.283	26.979
Storage	647.354	789.608	5.31	0.000	59.278	7069.560***
Market	0.926	1.386	-0.05	0.959	0.049	17.413

Transport	1.111	1.120	0.10	0.917	0.154	8.021
Market Infrastructure	6.557	7.969	1.55	0.122	0.605	71.007
Credit	0.959	0.618	-0.06	0.949	0.271	3.391
Legal fee	29.077	18.107	5.41	0.000	8.580	98.542***
Policy	0.367	0.206	-1.79	0.074	0.122	1.102
Income	0.999	0.000	-4.35	0.000	0.999	1.000***
Gross Margin	1.000	0.000	3.60	0.000	1.000	1.000***
NOH	1.000	0.000	0.20	0.845	0.999	1.000
NOG	0.997	0.002	-1.60	0.109	0.994	1.001
NOS	1.001	0.001	1.03	0.304	0.999	1.002
AVPH	0.839	0.037	-3.97	0.000	0.769	0.915***
AVPG	1.014	0.015	0.90	0.367	0.984	1.043
AVPS	0.952	0.019	-2.39	0.017	0.913	0.991**

***, **, *: Significant at (P<0.01), (P< 0.05) and (P<0.1) , respectively.

3.2 Impact of the hides and skin business on the traders' income

3.2.1 Exclusion Restriction

To analyse the impact of the hides and skin business on the traders' income the endogenous switching regression (ESR) model was used. This study used 2 exclusion restrictions which included availability of contracts between the traders and the buyers of the collected hides and skin and the period of storage of the hides and skin. Firstly, contracts are important in this hides and skin business because they assure the traders of the availability of market for their products and secondly the period of storage is important because it determines the choice of occupation of the trader in this business as either a middle man or an owner of the registered premise.

Table 3 Validity of the selected instruments

Variable	**Occupation of the trader**	
	Coef	**Std error**
Contract	0.425	0.262
Period	-0.085**	0.031
Constant	-1.595*	1.867
Wald test	-20.707***	

***, **, *- Significant at (P<0.01), (P<0.05) and (P<0.10), respectively

In the study, the wild test was significant and hence indicated the goodness of fit of the endogenous switching regression model hence solving the problem of endogeneity.

3.3 Endogenous Switching Regression estimates for the selected outcome

Table IV gives the results of the ESR model whereby the first column presents the determinants of an individual participating in the hides and skin business while the second and the third column provides determinants of the traders' income for middlemen (1) and owners of registered premises (0), respectively.

Table 4 Endogenous switching regression model estimates for selected outcome from the business

	Occupation of the trader		**Returns from the business**			
			lgGMBUSS_1		**lgGMBUSS_0**	
	Coef	Std.Err.	Coef	Std.Err.	Coef	Std.Err
GND	0.345256	0.46133	0.01228	0.06029	0.30333	0.19601
educ	-0.01293	0.04147	0.00508	0.00383	-0.00928	0.01825
age	-0.00189	0.00901	-0.00187*	0.00104	-0.00738*	0.004
exp	-0.00525	0.00988	-0.00148	0.00103	0.0045	0.00444
TMBS	-0.03235*	0.01767	-0.0029	0.00297	-0.00212	0.00733
lnNOH	-0.03604	0.06253	0.0005	0.00647	0.08428***	0.02654
lnNOG	-0.09977	0.10492	0.00708	0.0107	-0.01436	0.04807
lnNOS	0.056863	0.10274	0.0068	0.00943	0.09717**	0.04767
BUSS	0.068669	0.53765	0.0193	0.04422	0.31948	0.22549
MKTTYP	0.690195	0.92348	0.02924	0.15258	0.1976	0.42849
GRD	0.315707	0.30264	0.02468	0.04422	0.13713	0.14193
credit	0.571325	0.37592	-0.06236	0.04878	-0.08169	0.20002
TRNNG	0.282144	0.40588	0.11698*	0.0684	0.35635**	0.16863
CNTRCT	0.424588	0.26218				
PRD	-0.08527**	0.033115				
_cons	-1.59512	1.86756	7.9946***	0.4352	2.84493***	0.70714
/lns1	-2.42532***	0.17522				
/lns2	-0.80136***	0.13395				
/r1	0.20184**	1.40566				
/r2	1.60371***	0.42272				
sigma_1	0.08845	0.0155				
sigma_2	0.44872	0.06011				
rho_1	0.19915	1.34991				
rho_2	0.92223	0.06319				

LR test of indep. eqns. chi2 (1) =5.18***; Wald chi2 (13) =24.89; Log likelihood= -20.707928 ***, **, *- Significant at (P<0.01), (P<0.05) and (P<0.1), respectively.

3.4 Determinants of occupation of the hides and skin traders

The time that one has been in the hides and skin business and the period that one stays with the collected hides and skin before selling them have a great influence on the occupation that a trader takes part in this business. The time in business is significant at (P<0.1). Both middlemen and owners of registered premises had been in the business for more than 10 years although the owners of registered premises had been in the business longer than the middlemen. This is likely to be because the traders had had direct business deals with the tannery making it easier for them have better access there hence selling their products to them.

The period of storage is significant at (P<0.05) and is important because those traders who could not preserve their collected hides and skins and stay with them longer than a day opted to be middlemen while those who could preserve and stay with them for a month or longer opted to be owners of registered premises. The owners of registered premises,

preferred this occupation because they had ever dealt with green, salted and dried hides hence had opted to deal in salted hides which can stay for a longer time without being spoilt thus incurring little losses and also their daily collection is accumulated for a at least a month thus making them enjoy economies of scale due to cheaper salting costs (salt and employees) and transportation costs to the tannery while the middlemen opt for their occupation due to lack of capital to maintain and run a registered hides and skin premise.

3.5 Factors influencing the gross margin earned from the business

For the middlemen, age and training have a significant influence on the gross margin earned from the business. Both of them are significant ($p<0.1$). The average age of the middlemen was 44 years and they were younger than the owners of registered premises hence likely to be less risk takers to engage in value addition of the hides and skin therefore opt to make easy money quickly by just collecting the hides and skin and selling them while still raw to the owners of registered premises. Very little training has been done among the traders and therefore little or no knowledge on proper preparation and maintenance of the collected hides and skin to ensure delivery of high quality raw materials to the tanneries. In this study, only 18% of the owners of registered premises and ($P<0.1$) of the middlemen had received training on how to handle hides and skin.

For the owners of registered premises, age, the number of hides collected, the number of sheep skin collected and training have a significant influence on the amount of gross margin that one earns from the business. The average Age of the owners of registered premises was 48 years and their years of experience were higher than that of the middlemen. From the study, they started as middlemen and discovered the benefits of owning a registered premise and therefore ventured into it. The number of hides collected is significant at ($p<0.01$), this is because the hides prices are based per weight (Kg) of hide sold and it fetches a high price when salted and therefore the more the number of hides collected by a trader, the more the income will be earned from the business. Number of sheep skin collected is significant at ($P<0.05$), comparing the number of sheep skin collected with the number of goat skin collected, the sheep skins were more which confirms the study of Korir, (2016) whereby, the increase in population of sheep and goats recorded was 60% and 39%, respectively between 2010 and 2014. Training was significant at ($p<0.05$) this helps the traders while doing business and are able to maintain high quality for their products and thus minimizing wastage due to poor handling of the collected hides and skin and ensuring that they maximize on the income they earn from their business.

3.6 Mean treatment effects on the gross margin from the business

The results in table 5 show the impact of the hides and skin business on the traders' income (gross margin from the business) which was estimated.

Table 5 Mean treatment effects on gross margin from the business

Treatment effects	**Income based on occupation**				
	lgGMBUSS_1		**lgGMBUSS_0**		
ATT(Group1; middlemen	a)8.2586	0.0089	b)8.2299	0.0084	0.0295***
ATU(Group0;ownersofregistered premises)	c)4.9213	0.0536	d)4.4257	0.0519	-0.4961***
Heterogeneity effects	3.3373		-3.8042		-0.4666

***, **,*: Significant at ($P<0.01$), ($P<0.05$) and ($P<0.1$), respectively

The values in the cell (a) and (d) represent the mean values of the logarithms of the gross margin as the incomes for the middlemen and owners of registered premises while cell (b) and (c) represent the counterfactual expected values. The average treatment effect on the treated (ATT) was 0.0295 (an equivalent to 2.95%) which represents the actual effect that a trader earns from being a middleman. On the other hand, the findings on the average treatment effects on the untreated (ATU) shows that the income of the owners of registered premises would decline by 0.4961 (49.61%) if they were to be middlemen.

Comparing the amount that the traders earn from the two occupations, an owner of a registered premise would lose 49.61% by being a middleman and that which a middleman earns 2.95% from operating a business, the middlemen would have earned more if they owned a registered premise. This implies that being an owner of a registered hides and

skin premise increased the likelihood of having a higher income as compared to the counterfactual case of being a middleman. The traders would probably be constrained socially and economically for example their low level of education and lack of training on handling hides and skin would limit them from operating a registered premise and inadequate funds might also hinder them due to higher operational costs for maintaining a registered hides and skin premise.

The row of heterogeneity effects shows what each of the groups would have attained if they chose the other occupation. If a middlemen had decided to be an owner of a registered premise, then he/she would be expected in a month, to have attained more income by log 3.3373 (KES 2,174) than the Owners of registered premises. This implies that the middlemen would be better off than the owners because they would deny the owners the raw materials that they supply to them yet they are the ones who directly source the raw materials from the slaughter houses and the community then supply to them. This implies that the owners of registered premises would be worse off than the middlemen and would likely quit the business. Contrary, if an owner of registered premise had decided to take the role of a middle man and source the hides and skin directly from the slaughter houses and the community and sold their collected hides and skin without adding value to them, then they would have reduced their income by log 3.8042 (KES`6,371). The transitional heterogeneity effect is negative, implying that the effect realized on income is attributed to unobservable trader characteristics and not the occupation of the hides and skin trader.

4 Conclusion

The main factor that makes one to participate in Hides and skin business is family because it is a type of business that is passed on from one generation to another. The owners of registered premises earn more from hides and skin trade as compared to the middlemen

Recommendation

More sensitization should be done on the importance of hides and skin to encourage new and more participants in the leather value chain. More training should be offered to the hides and skin traders on the importance of value addition on hides and skin to enable traders earn more from the business. The government should provide incentives such as financial assistance to the traders in such regions in order to tap more income from this resource rather than leaving it wasted.

Compliance with ethical standards

Acknowledgments

Kenya Climate Smart Agriculture Project (KCSAP) for funding this research. The hides and skin traders who willingly provided the relevant information for the study and the enumerators who helped me collect data from the respondents. Department of Agricultural Economics and Agribusiness Management. Egerton University for supporting the study.

Disclosure of conflict of interest

The authors have no competing interests.

Statement of ethical approval

The present research work does not contain any studies performed on animals/humans subjects by any of the authors.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

References

[1] Ali, M. (2014). Sampling and Sample Size Estimation. Geneva, 1-43.

[2] Caliendo, M. and Kopeinig, S. (2005). Some Practical Guidance for the Implementation of Propensity Score Matching, 1-32. Institute for the Study of Labor (IZA) discussion paper no.1588.

[3] Crowther, D. & Aras, G. (2008). Corporate Social Responsibility, 1, 1-144.

[4] Dunfee, T. W. (2006). A Critical Perspective of Integrative Social Contracts Theory: Recurring Criticisms and Next Generation Research Topics. Journal of Business Ethics, Vol 68, Issue 3 PP 303–328 DOI 10.1007/$10551-006-9016-6

[5] El-Habil, A. (2016). An Application on Multinomial Logistic Regression Model Pakistan Journal of Statistics and Operation Research Vol.8 Issue 2 pp271-291 DOI DOI: 10.18187/pjsor.v8i2.234

[6] Gujarati, D. (2012). Econometrics by Example. Palgrave Macmillan.

[7] Greene, W. and Hensher, D. (2009). Modeling Ordered Choices. Stern School of Business, New York University, Department of Economics.

[8] Jabbar, M. Kiruthu, S.Gebremedhin, B. and Ehui, S. (2002). Essential Actions to Meet Quality Requirements of Hides, Skins & Semi-processed Leather from Africa. Amsterdam, the Netherlands.

[9] Korir R, (2016). Beef Value Chain Assessment for South-West Mau, Kenya Prepared for: Initiative for Sustainable Landscapes, Program of IDH, The Sustainable Trade Initiative, Pages 1-53

[10] Mattila, H. and Memedovic, O. (2008). The Global Leather Value chain: the industries, the main actors and prospects for upgrading in LDCs. International Journal of Technological Learning, Innovation and Development, 1(4) PP 482-519 DOI:10.1504/IJTLID.2008.021965

[11] Ministry of Agriculture Livestock and Fisheries, (2015). Agricultural Policy Security. Republic Of Kenya

[12] Mwinyihija, M. (2009). Hides, skins and leather in Kenya – Leather International, 2 February.

[13] Mwinyihija, M. (2010). Hides, Skins and Leather Value addition Initiatives; The Kenyan Scenario. Conference proceeding, (1-40). Conference held at Nairobi Safari Club, MawinguConference Room,On 23rd –25th March.

[14] Mwinyihija, M. (2015). Evaluation of Competitiveness Responses from the Leather Value Chain Strata in Kenya. Research in Business and Management, 2(1), PP1–24 DOI: 10.5296/rbm.v2i1.xxxx.

[15] Naporos, S. (2012). Factors Influencing the Quality of Hides and Skins, A Case of Kajiado County of Kenya. Msc thesis,University of Nairobi

[16] Omran, M. (2015). Theoretical Perspectives on Corporate Social Responsibility Disclosure: A Critical Review. International Journal of Accounting and Financial Reporting, Vol 5 Issue 2, PP 38-55. DOI:10.5296/ijafr.v5i2.8035.

[17] Onionkiton, G. (2014). Market Participation among Cassava Value Chain Actors in Rural Benin. Msc thesis,University of Ghana.

[18] Schaltegger, K. & Herzig, M. (2002). Sustainability Management in Business Enterprises. Berlin: The Federal Ministry for the Environment, Nature conservation and Nuclear Safety.

[19] UNIDO, (2016). Networking small enterprises in Ethiopia's leather sector, Inclusive and Sustainable Industrial Development.

[20] Wangui A.N, (2016).The Performance of Hides and Skins Sub – Sector and Associated Economic Losses in Wajir County, Kenya, A thesis submitted to the University of Nairobi in partial fulfillment of requirements for Master of Science degree in Leather Science, pages 1-136

[21] Wanyoike F, Godiah L, Nadhem M, Kiptoo, E & Ibrahim, G, (2018). An analysis of the hides and skins value chain in Somaliland, International Livestock Research Institute (ILRI)

[22] World Bank Group and Economic Transformation Group, (2015). Kenya leather industry, 1-126.

Author's short Bioghraphy

Ruth Mwenje Lumarai received a Bachelor's of Science Degree in Agribusiness Management from Egerton University in 2014 and is currently completing her studies for MSc Degree in Agribusiness Management at Egerton University.

	**George Owuor** is a Professor in the Faculty of Agriculture, Department of Agricultural Economics and Agribusiness Management. He received his PhD through DAAD, his MSc in Agricultural Economics at Egerton University and Bachelor of Agribusiness Managment at Egerton University.
	**Edith Gathungu** received her PhD in Human Resource Management from Jomo Kenyatta University of Agriculture and Technology, MSc in Labour Laws and Labour Walfare from Pune University and a Degree in B Com from Pune University. She is currently a Lecturer in Egerton University, Department of Agricultural Economics and Agribusiness Management.