Evaluation of Productivity Responses from the Leather Value Chain Strata in Kenya

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Abstract

Productivity is fundamental in addressing key economic indicators such employment, wealth creation, trade, competiveness and rural development in Africa. The inattentive attitude towards the importance of productivity in most African countries has culminated to problems that entail lack of sustainable productivity framework in their commodity development. In retrospect, as a panacea the value addition initiatives being set up in the continent should as a prerequisite take cognizance of productivity to its livestock agro-based production chain. This background, therefore, prompted the significance of this study to focus in identifying and examining the survey responses from the leather strata in Kenya related to productivity. In addition, the study evaluated the significance of the interrelationship between various stratums that interphase in the value creation process of the leather sector influence activities related to productivity. During the prognosis, a quantitative approach (n=244), descriptive analysis including an aggregate score to ascertain the top activities impacting on productivity in Kenya was carried out. The results indicated that whilst producers were mainly concerned with transport related costs, skilled man power attributed a major constraint amongst the slaughterhouse, traders, tanners and footwear. However, tanners involved with the processing of the hides and skins, identified enhancement of Total factor of productivity (TFP) as fundamental to their productivity. This was a significant result as it illustrated appropriate focus on management of costs and enhancing productivity to spar generation of tangible value-addition initiatives and transform the leather strata to be competitive. Thusly, the overall results indicated that productivity related activities were significant (p<0.05) to the value chain stratum. Therefore, this observation strengthened the aspect of considering

productivity as fundamental in the leather sector's quest for achieving higher performance in the leather strata value addition initiatives in Kenya.

1. Introduction

Productivity is fundamental in any entrepreneurial activity for all tradable commodities worldwide. Hirsch (1947) in a classical review indicated that establishing a relationship between input and output in the perspective of considering capital, labor, and consumer provides a picture of productivity. Whilst in a much modern era, Young, Wilkie, Ewing, & Rahman, (2008) considered productivity more important than profits and revenue as it directly reflects on the efficiency and effectiveness of an enterprise's policies and processes. Therefore, to uphold the drive in entrepreneurship, particularly in the leather sector the ability to recapitalize, efficiency in production and effectiveness in linking with appropriate markets is fundamental. In retrospect to capitalization, weak financial sectors have been identified as a factor in reducing productivity, investment and limiting job creation in the manufacturing sector (World Bank, 2012). For instance a study in Ethiopia by Demeke et al., (2011) indicated that limited access to finance, weak technical know-how, high handling costs, inadequate market institutions, weak private sector capacity and underdeveloped processing industrial sector remained fundamental problems towards the country's productivity.

The leather industry in East Africa is one of the fastest growing agro-based sectors in the region. The sector is dependent to the strong livestock base that is conspicuous in the area due to its prevailing ecological conditions that support livestock rearing and related enterprises (Mwinyihija, 2014a). This therefore pits the sector as the primary source of livelihood in providing food security and sustenance to most of the inhabitants in the region. In Kenya, leather manufacturing priority is based on the status of the performance of the livestock agro-based sector (Mwinyihija, 2014b). This type of sectoral dependence is predominantly characterized with relatively abundant natural resources of the country as well as employs labour intensive technologies.

Accordingly, Lall (2001a, 2001b) indicated that such an approach to enterprises is known as 'resource based and low-technology' industries. In light of the same when considering the livestock resource (including hides and skins) rich countries at domestic levels in Africa this may viewed as a comparative advantage including their apparently limited requisite for highly skilled personnel. To the contrary, this scenario dose not preempts and stimulates growth in technology, efficiency, competitiveness and productivity in the leather sector development. For instance, in Africa's leather sector the highest concern is the cost of labour where the cost of labour per worker is conspicuously higher than real value added per worker. This observation denudes the envisaged optimal labour productivity and negatively impacts on the competitiveness of the leather sector.

Most of the national governments in the East African region are directing their efforts in developing policies that target agro-based commodities for value addition. The levels of emphasis and implementation as concerns the process is varied with different national governments in aspects related to legal and policy framework. Thusly, the socio-economic impact of the sector in addressing key aspects such as poverty alleviation, wealth creation, gender parity and rural development has remained elusive (Conceição, Mukherjee, & Nayyar,

2011; Handoussa, 2009). However, in the proposed study the intent is to evaluate whether at the first instance, the existing policies are adequate, the degree of value creation is sufficient, the growth factors pursued lead to productivity of the leather sector. However, studies related to value addition in Africa have not taken cognizance of the importance of productivity that would enhance the drive towards value creation in the continent's leather sector.

The Research Problem is underscored by a lack of sustainable productivity framework in Kenya. Yet, this is fundamental to the value addition initiatives of the leather sector productivity of its production chain. In the developing countries, this is a pertinent issue that has been inadequately addressed and as such adversely impacts on alleviation of poverty, employment creation, wealth generation, gender parity, rural development and overall productivity of the leather sector (McKague & Oliver, 2012). The problem has further been compounded in the developing countries with observed high losses along the production chain, lack of appropriate strategic interventions and implementation modalities which would have ensured tangible productivity in terms of value addition in the leather strata (Sounderpandian, Prasad and Madan, 2008). Thusly, the need to conceptualize the underpinning factors is paramount to provide tangible interventions or optimize on identified unexplored opportunities within the leather stratums in boosting productivity through value addition initiatives in Kenya (Sharma et al., 2010).

As such the significance of the research is to explore on how the productivity of the leather sector could redress the socio-economic indicators such as employment generation, wealth creation, gender parity and rural development. According to Saleth et al., (2008), it is critical that related studies that investigate on the indicators mentioned address the complexities and inadequacies of the sector's productivity and sustainability appertaining to value addition.

It is with this background that the proposed study intends to pursue and evaluate these shortcomings, in particular with a case study based on Kenya's leather sector. The support theory to the investigation will be based on positivist paradigm and the research question will be designed in the scope of verification of hypotheses and research being conducted empirically. As such a quantitative approach is anticipated to be appropriate where the application of correlation analysis will further allow identifying each stratum's role and determining relationship from within and amongst the variables. Moreover, if there are also, differences among the groups, the source of the difference will be known. The design will integrate a non-experimental technique where the study will survey a sample of the population in the Kenya leather sector. In achieving this goal, a primary research tool based on structured questionnaire type survey will be applied.

The research aim will entail identifying and examining the responses from the leather strata in Kenya related to productivity. Moreover, evaluate the significance the interrelationship between various stratums that interphase in the value creation process of the leather sector influence activities related to productivity. Finally, identify through an aggregate score which among the activities, the respondents deemed crucial towards productivity of their respective stratums.

The outcome of the study is envisaged to encompass a deeper comprehension of productivity to ascertain the performance of the leather sector in Kenya. The proposed study has both a theoretical and practical inclination as it expands on the knowledge base related to the interphase of productivity and its direct focus towards value creation.

2. Methodology

2.1 Sample Size

The sample size was based on an estimated population of 1,031 registered leather value chain players drawn from the Kenya leather sector. The sample size composition ensured incorporation of randomly selected players from each of the phases or stratum of the value chain. The sample size was determined through Sigma XL Version 6.2 (2013), which provided a target of 281 respondents. The statistical power analysis using this sample size indicated a value of $\alpha = 0.05$ (where H_O; $P_O = 0.5$ and $Ha \neq 0.5$), Power (1-Beta) $= 0.922$. This was corroborated with an online a-priori sample calculator, an analytical tool by Soper (2013). Triola (2009) earlier indicated that in a quantitative study, a minimum of 30 could provide a normal distribution for a parametric analysis.

2.2 Sampling Procedures

The study adopted a random sampling strategy for all respondents but ensured that all the strata in the value chain were incorporated. The minimum number of respondents from each stratum was targeted. Due to the complexity of the leather value chain (Viju, 2008), such as the distances involved and remoteness of the localities in the study, internet-based survey was viewed most suitable but unfeasible due to the poor infrastructural support for internet usage as a tool. Thusly, irrespective of the convenience of electronic surveys, face to face survey was preferred due to conduct the research.

2.3 Data Collection Methodology

The survey was conducted using structured questionnaires. Invitations to participate in the survey were notified through emails, telephone calls, and surface mails depending on the communication method with the greatest ease of accessibility and also the researcher's established relationships with the participant.

2.3.1 Statistical Techniques

The data analysis included descriptive statistics, calculated to describe the sample. Due to the large sample size ANOVA and pairwise set of means rather than *t*-test was performed on the mean responses of the respondents to determine if there were differences between the groups within the various levels (pre-, peri- and post-slaughter) and value chain stages (producers, butchers, hides and skins traders, tanners, footwear and leather-goods manufactures).

The statistical technique adopted a stratified random sampling approach to adequately analyze the distinct groupings in the leather value chain and their inter-relationship. The

rationale for this choice was based on the different strata of the leather chain (e.g. producers, traders, tanners, and manufacturers of leather-goods), wherein the individual role and relationship with each other was evaluated.

Keller and Warrack (1999) indicated that the identified difference would be attributed to the divergence among the groups which is also applicable to the leather value chain. Furthermore, a correlation coefficient was used to determine if correlations exist between value addition opportunities and the identified outcome (trade). By using ANOVA and the means matrix to carryout multiple comparisons to test $H_O = \mu1 = \mu2 = \mu3\ldots\ldots K$; H_a: at least one pairwise set of means are not equal at $p < 0.05$. Pursuance of data analysis due to the assumption of equal variance when using ANOVA included test of medians (Kuskal-Wallis test) and normality (Levene's test which is robust on multiple group comparison to ascertain normality). In case of unequal variances in the response data Welch's ANOVA was used. The basis overall was to determine if there were differences between the stratum within the various levels (pre-, peri- and post slaughter) and value chain stages (producers, butchers, hides and skins traders, tanners, footwear and leather-goods manufactures) by derived confidence limits and p-value for null hypothesis H_O: $p = po$. In this study, using ANOVA and obtaining the coefficient of determination and pairwise probabilities allowed for quantification of data and to appropriately generalize the results obtained from the population (Loslever, Cauffriez, Caouder, Turgis, & Copin, 2012).

In addition, aggregated score on weighted total frequency score for each thematic activity in each stratum was analyzed. The purpose of using this technique was to weigh the frequency according to the participant's responses in each of the activity in a stratum (e.g. Producer, Butcher etc.) leading to the mentioned themes (i.e. productivity). The rationale was that the participant's response on an activity in a thematic area over another determined the relationship between value addition opportunities as measured in the leather strata in relation to the value chain. An aggregated score and a mean for each activity per stratum were computed to facilitate their ranking. The aggregated score for each parameter or activity was calculated by multiplying the total number of frequencies of each option by its respective value assigned in the various scale of the survey question.

2.3.2.1 Descriptive Statistics

The study used descriptive statistics to summarize the sample's measures of central tendencies (i.e. means, etc.) and variability (i.e. standard deviations) to determine whether the data sets would exhibit deviations (positive or negative).

2.3.2.2 Correlational analysis and statistical package

This study used correlation studies (coefficient of determination (R^2) to deduce or explain on strata's variation in relation to the identified independent variable. However, while correlation analysis demonstrated the strength of the relationship between the variables, it is important to characterize the nature of the relationship (Nikolić, Muresan, Feng, & Singer, 2012). Therefore, during the study, coefficient of determination (R^2) provided a measure of

strength of the relationship between independent and dependent variables and *p*-value for null hypothesis H_O: $p = po$ .To evaluate the coefficient of determination analytical tools from Sigma XL (version 6.2; 2013) was used. The advantage of this tool was its ability to identify the sub-issues (related to the research objectives stated earlier) of the study that significantly affected value addition and Trade in the leather sector.

3. Analysis and Presentation of Results

The pilot study had 11 sections with a total of 111 assessed items within the instrument and attained a Cronbach alpha of 0.869. The survey instruments had a mixture of dichotomous and multi-point scales as such there were relatively heterogeneous variances in which case the use of standardized variables was appropriate (Santos, 1999; Falk & Savalei, 2011). The attained value of 0.869 in this study was ideal value (where Cronbach alpha values between 0.7 – 0.95 were considered acceptable with values above 0.80 mostly preferred) limits for ascertaining internal consistency and homogeneity (Dunn, Baguley & Brunsden, 2013; Tavakol & Reg, 2011).

Out of the targeted 281 respondents to be interviewed, the study yielded 244 valid responses providing a response rate of 87%. The demographics of the sample included number of respondents in the identified strata in the value chain map along with gender involvement and comparisons. Age, position level, type of organization, education level and type of specialization depicted the diversity and characterization of the core value players of the leather value chain. Moreover, experience provided an insight to the conformity of the experimental prerequisite (of respondents having equal or more than 5 years exposure to the leather sector) and ultimately ascertain the reliability of responses emanating from the value chain players.

Thus, as an attempt to articulate the productivity aspects of this study, the leather chain strata (i.e. Producers, Butchers, Traders, Tanners, Leathergoods and Footwear) responses were analyzed to comprehend the sectors performance in Kenya.

3.1 Productivity

3.1.1 Employment

The study analyzed employment response data from the survey conducted for the leather strata in Kenya covering the period 2004 – 2013 (Table 1). An overall review of the strata indicated that there was progressive increases in employment from 2004/05 (12.29%) towards 2012/13 (21.29%). Considering the individual stratum on trends towards employment, Butchers/Slaughter house owners demonstrated the lowest response number of employee per year depicting 8 employees on average along the years under review.

Table 1. Number and Percentage of response related to value chain strata on identified activities towards productivity (All respondents)

Activities	Leather Value Chain Strata	Total

		Producer	Butcher/ Slaughter -houseowner	Trader	Tanner	Leather Goods	Footwear	
Number of Employees (2004-2005)		18 (13.58%)	6 (12.4%)	6 (16.64%)	27 (11.76%)	3 (11.67%)	4 (14.2%)	63 (12.29%)
(2006-2007)		19 (14.5%)	7 (14.01%)	6 (17.54%)	30 (13.13%)	3 (12.59%)	4 (14.49%)	68 (13.41%)
(2008-2009)		22 (16.78%)	7 (15.62%)	5 (15.78%)	31 (13.63%)	3 (12.59%)	4 (15.63%)	73 (14.31%)
(2010-2011)		23 (17.55%)	8 (17.75%)	6 (16.43%)	43 (18.95%)	4 (15.33%)	4 (16.48%)	95 (18.68%)
(2011-2012)		24 (18.46%)	9 (19.2%)	6 (16.76%)	46 (20.26%)	5 (21.97%)	4 (17.05%)	102 (20%)
(2012-2013)		25 (19.13%)	10 (21.02%)	6 (16.84%)	51 (22.26%)	6 (25.86%)	6 (22.16%)	108 (21.29%)
Availability of skilled man power	Available	24 (26.09%)	21 (51.22%)	31 (44.29%)	2 (28.57%)	7 (43.75%)	7 (50%)	92 (38.17%)
	Available but expensive to hire	55 (59.78%)	16 (39.02%)	32 (45.71%)	1 (14.29%)	7 (43.75%)	4 (28.57%)	115 (47.72%)
	Not Available	13 (14.13%)	4 (9.76%)	7 (10%)	4 (57.14%)	2 (12.5%)	3 (21.43%)	34 (14.11%)
Growth in wages/salary 2004-2013	No increase (0%)	25 (29.07%)	1 (2.86%)	20 (28.17%)	1 (14.29%)	1 (6.25%)	1 (9.09%)	49 (21.59%)
	Increased (1-5%)	11 (12.79%)	15 (42.86%)	14 (19.72%)	2 (28.57%)	3 (18.75%)	2 (18.18%)	48 (21.15%)
	Increased (6-10%)	35 (40.7%)	8 (22.86%)	6 (8.45%)	1 (14.29%)	6 (37.5%)	6 (54.55%)	62 (27.31%)
	Increased (11-20%)	2 (2.33%)	3 (8.57%)	25 (35.21%)	1 (14.29%)	2 (12.5%)	0 (0%)	33 (14.54%)
	Increased (21-30%)	13 (15.12%)	5 (14.29%)	3 (4.23%)	2 (28.57%)	0 (0%)	1 (9.09%)	24 (10.57%)
	Increased (31% and above)	0 (0%)	3 (8.57%)	2 (2.82%)	0 (0%)	2 (12.5%)	1 (9.09%)	8 (3.52%)
	Decreased over time	0 (0%)	0 (0%)	1 (1.41%)	0 (0%)	2 (12.5%)	0 (0%)	3 (1.32%)
Production								
Contribution of Wages and salaries	None	0 (0%)	1 (2.56%)	16 (22.86%)	0 (0%)	1 (5.56%)	0 (0%)	18 (7.56%)
	1-10 %	42 (47.19%)	12 (30.77%)	21 (30%)	3 (42.86%)	6 (33.33%)	4 (28.57%)	89 (37.39%)
	11-25%	23 (25.84%)	23 (58.97%)	22 (31.43%)	2 (28.57%)	10 (55.56%)	5 (35.71%)	85 (35.71%)
	26-50%	24 (26.97%)	3 (7.69%)	11 (15.71%)	2 (28.57%)	0 (0%)	5 (35.71%)	45 (18.91%)
	51% and above	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (5.56%)	0 (0%)	1 (0.42%)
Contribution - Raw Materials	None	0 (0%)	1 (2.86%)	13 (18.31%)	0 (0%)	0 (0%)	0 (0%)	14 (5.98%)
	1-10 %	15 (16.67%)	8 (22.86%)	14 (19.72%)	2 (28.57%)	2 (11.11%)	1 (8.33%)	42 (17.95%)
	11-25%	46 (51.11%)	5 (14.29%)	13 (18.31%)	1 (14.29%)	3 (16.67%)	2 (16.67%)	71 (30.34%)
	26-50%	29 (32.22%)	17 (48.57%)	5 (7.04%)	4 (57.14%)	9 (50%)	4 (33.33%)	68 (29.06%)
	51% and above	0 (0%)	4 (11.43%)	26 (36.62%)	0 (0%)	4 (22.22%)	5 (41.67%)	39 (16.67%)
Contribution - Fuel and Energy	None	0 (0%)	2 (5.71%)	14 (20.59%)	1 (14.29%)	4 (23.53%)	1 (9.09%)	22 (9.61%)
	1-10 %	67 (74.44%)	20 (57.14%)	29 (42.65%)	1 (14.29%)	10 (58.82%)	6 (54.55%)	134 (58.52%)
	11-25%	22 (24.44%)	11 (31.43%)	22 (32.35%)	3 (42.86%)	2 (11.76%)	2 (18.18%)	62 (27.07%)
	26-50%	1 (1.11%)	1 (2.86%)	2 (2.94%)	2 (28.57%)	0 (0%)	2 (18.18%)	8 (3.49%)
	51% and above	0 (0%)	1 (2.86%)	1 (1.47%)	0 (0%)	1 (5.88%)	0 (0%)	3 (1.31%)
Contribution -Financial Costs	None	0 (0%)	3 (8.57%)	15 (21.43%)	0 (0%)	1 (5.88%)	3 (25%)	22 (9.52%)
	1-10 %	8 (8.99%)	17 (48.57%)	16 (22.86%)	1 (14.29%)	7 (41.18%)	4 (33.33%)	53 (22.94%)
	11-25%	29 (32.58%)	1 (2.86%)	34 (48.57%)	4 (57.14%)	7 (41.18%)	4 (33.33%)	80 (34.63%)
	26-50%	52 (58.43%)	13 (37.14%)	4 (5.71%)	2 (28.57%)	2 (11.76%)	1 (8.33%)	74 (32.03%)
	51% and above	0 (0%)	1 (2.86%)	1 (1.43%)	0 (0%)	0 (0%)	0 (0%)	2 (0.87%)
Contribution –Taxes	None	1 (1.1%)	4 (11.76%)	16 (23.19%)	0 (0%)	2 (11.76%)	1 (8.33%)	24 (10.39%)
	1-10 %	87 (95.6%)	24 (70.59%)	22 (31.88%)	5 (71.43%)	10 (58.82%)	6 (50%)	155 (67.1%)
	11-25%	2 (2.2%)	3 (8.82%)	26 (37.68%)	2 (28.57%)	4 (23.53%)	4 (33.33%)	41 (17.75%)
	26-50%	1 (1.1%)	2 (5.88%)	4 (5.8%)	0 (0%)	0 (0%)	1 (8.33%)	8 (3.46%)
	51% and above	0 (0%)	1 (2.94%)	1 (1.45%)	0 (0%)	1 (5.88%)	0 (0%)	3 (1.3%)
Factors affecting Productivity								
total factor productivity	Increased	26 (30.59%)	25 (71.43%)	21 (35%)	5 (71.43%)	11 (68.75%)	8 (66.67%)	96 (44.44%)
	Decreased	45 (52.94%)	10 (28.57%)	16 (26.67%)	2 (28.57%)	4 (25%)	2 (16.67%)	79 (36.57%)
	No change	14 (16.47%)	0 (0%)	23 (38.33%)	0 (0%)	1 (6.25%)	2 (16.67%)	41 (18.98%)
increased specify range	1-5%	1 (2.27%)	14 (50%)	14 (53.85%)	3 (60%)	3 (23.08%)	2 (25%)	37 (29.84%)
	6-10%	16 (36.36%)	12 (42.86%)	7 (26.92%)	2 (40%)	4 (30.77%)	2 (25%)	43 (34.68%)
	11-25%	15 (34.09%)	2 (7.14%)	5 (19.23%)	0 (0%)	6 (46.15%)	4 (50%)	32 (25.81%)
	26% and above	12 (27.27%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	12 (9.68%)
if decreased specify range	1-5%	16 (32%)	1 (9.09%)	12 (80%)	1 (50%)	1 (16.67%)	0 (0%)	31 (36.05%)
	6-10%	33 (66%)	9 (81.82%)	3 (20%)	1 (50%)	2 (33.33%)	2 (100%)	50 (58.14%)
	11-25%	1 (2%)	1 (9.09%)	0 (0%)	0 (0%)	1 (16.67%)	0 (0%)	3 (3.49%)

	26% and above	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (33.33%)	0 (0%)	2 (2.33%)
measures to enhance labour productivity	Yes	75 (85.23%)	22 (64.71%)	17 (39.53%)	6 (85.71%)	11 (64.71%)	9 (75%)	141 (69.8%)
	No	13 (14.77%)	12 (35.29%)	26 (60.47%)	1 (14.29%)	6 (35.29%)	3 (25%)	61 (30.2%)
measure to enhance total factor prod	Yes	67 (83.75%)	25 (83.33%)	16 (44.44%)	7 (100%)	11 (64.71%)	10 (83.33%)	137 (74.86%)
	No	13 (16.25%)	5 (16.67%)	20 (55.56%)	0 (0%)	6 (35.29%)	2 (16.67%)	46 (25.14%)

In Table 1 the highest stratum on employee numbers were the Tanners on average (34) per year (2004-2013). The importance of leather processing by the Tanners in employing high number of persons is illustrated in this study. However, analysis of skilled manpower availability demonstrated that Butchers (51.22%) and Footwear (50%) stratum had availability of skilled manpower in meeting their requirements. This observation was directly translated to the high number of flayers (persons trained to remove the animal skins and hides immediately after slaughter) who are normally trained in-house and considered skilled due to the hands-on expertise required for the job. Whilst, for the Footwear stratum they acquire their semi-skilled persons from operating cobblers or previously trained footwear artisans in operational and those sourced from wound-up footwear companies.

Contrary to this observation in Table 1, Tanner's (57%) response illustrated that they experience unavailability of skilled manpower for their stratum. The specific responsibility at the tanning strata (which encompasses pre-tanning, tanning and post-tanning activities) equally requires specialized trained personnel. Unfortunately there are few training centers which can avail such manpower. Local institutions of higher learning in the country have embarked on training lower, medium to high level personnel in the leather field. These institutions are a probable approach in addressing the situation.

3.1.2 Production

In Table 1 the overall contribution (73.1%) of wages and salaries on production to the leather strata was observed to be between 1-25%. The stratums with the highest response were Butchers (58.97%) and Leather-goods (55.56%) who indicated a share of $11 - 25\%$ wages and salaries towards production. The tanners (42.86%) in comparison to other stratum seem to contain their wages and salaries contribution at 1-10% to production. This was an important observation for tanners whose narrow profit margins in dealing with semi processed materials requires them to reduce costs where they could e.g. on wage bills etc.

The strata responses (30.34%) depict that in general, raw materials illustrated 11-25% contribution to the leather production value chain strata. The highest in the stratum were Butchers (48%) (whose main input is livestock bought for meat production) indicating share contribution of 11-50%. As a result of meat production, high turnover of hides and skins as raw material were produced. Traders (36.62%) responses from the survey indicates' that the resultant hides and skins directly from the Butchers, contribute equal to or above 51% to the raw material input to the stratum. In retrospect, Tanners (57.14%) who use raw hides and skins and Leather-goods (50%) utilize finished leather, responded to have a 26-50% share contribution to leather production.

The leather strata's importance to fuel and energy share (1- 10%) in leather and leather goods production is conspicuous when the overall responses (58.82%) are analyzed (see Table 1).For instance, Producers (74.44%) were observed to have response to fuel and energy contribution share of 1-10% to their productivity. This particular observation illustrates the producer's response towards importance of transportation of estimated 6million animals per annum for meat production.

The livestock transport operation engage large tracks covering approximately 500 to 1000 km every 24-72hrs on average. This exercise consumes a lot of fuel to transport livestock to urban towns where major slaughter-houses are located. Share-wise, Tanners (42.86%) depicted a higher contribution of 11-26% towards fuel and energy in comparison to other stratums due to the highly mechanized operations supported by standby generators, boilers and use of lubricants for machinery during processing, transportation of semi-processed leather and delivery of tanning inputs.

Table 1 further demonstrates 34.63% responses of the leather strata participants showed 11-25% of financial costs contributed towards production in the value chain. An analysis of the Tanners (57.14%) responses also attributed 11-25% in their cost of leather production emanating from financial costs. This aspect is closely related to the payment mode of cash on delivery (COD) of all hides and skins delivered to the tanners. Moreover, tanners' exports are based on Freight on Board (FOB) bank certification mode for the release of their payment including other payment arrangements. Thus, the tanners to administer this approach there is need to service credit facilities, overdrafts and loans. This contributed to most of their incurred financial costs, thus, impacting towards the general expenditure towards leather production.

The other contributing share to production is that of taxes to the leather strata chain and was mostly pronounced at Pre-slaughter phases (i.e. Producer and Butcher levels) (Table 1). The Producers (95.6%) and Butchers (70.59%) responses illustrated that 1-10% of their production is impacted by taxes. This observation also provides the insight of inherent taxation and its causes. Included in such taxes are levies which encompass local government fee's charged en-route to Producers when purchasing and transporting livestock in some instances even through several districts (or currently referred to as Counties).

3.1.2.1 Factors Affecting Productivity

Table 1 provides responses towards Total Factor Productivity (TFP) which according to Dettori, Marrocu, and Paci (2012) captures how efficiently inputs are utilized and is key to project competitiveness. The overall leather strata response (44.44%) on these issues indicated that factors affecting productivity increased. Butchers (71.43%) and Tanners (71.43%) responded affirming to an increase in total factor productivity. The two stratums are at most known for operating on high demand, low competition and readily available markets for their products (i.e. Meat and semi processed leather). As such an opportunity to increase in their TFP is incentivized within their operational environment as explained earlier.

The study further illustrated that 34.68% responses from the leather strata affirmed 6-10% increase to TFP. Tanners had the highest responses (60%) depicting TFP increase of 1-5% (see Table 1). This observation supports the activity of the Tanners in value addition and the need to optimize on productivity to be competitive and profitable. On the other hand, Footwear stratum response (100%) showed a decrease of 6-10% bringing to the fore the challenges explained earlier related to the policy on second hand and poor quality footwear imports.

In an effort to avert on some factors affecting productivity the leather strata responded (69.8%) affirmatively towards enhancing labour productivity. Producers (85.23%) and Tanners (85.71%) responded in favour of enhancing labour productivity. For the Tanners, productivity based on the number of personnel per square foot (Sqft) of Leather produced, determines their profitability which as discussed earlier has a very narrow profit margin unlike footwear and leather goods. As such precautionary measures on the engagement of personnel are geared toward optimization in productivity per production unit in the stratum.

It was observed that Producers deploy a large number of workforce to cater for various activities in their stratum. This include staff engaged in livestock husbandry, selection and sorting for animals prepared for marketing and finally transportation with all activities requiring prerequisites to enhance labour productivity. The overall leather strata (74.86%) response illustrated (Table 1) that to overcome the factors affecting productivity it is fundamental to enhance TFP. Highest on this notion were the Tanners (100%) with quite high response factors in comparison to other stratums. The reason for the Tanners zeal has been explained and relates to the low profit margins due to their focus on semi-processed leather.

Table 2 shows the aggregated score, mean, standard deviation and rank order in relation to identified activities to towards productivity with producers. In this stratum the top aggregate score of 89.4 (with a mean of 0.98) and ranked first, illustrate and consolidates the producer's disapproval of multi-level and repeated levels of taxation and some levies charged en-route. This observation is associated with the several counties or districts the producers have to pass (at each county border point subjected to paying levies) during the delivery of livestock from primary source to the terminal market. The lowest response (ranked 12th) for this stratum provided the negation by producers in reversing on TFP. This observation indicated their resolve as always directed towards striving to improve rather than reverse on TFP.

Table 2. Aggregated score, mean, standard deviation and ranking on identified activities towards productivity with producers

Activities	Producer value chain stratum				
	Number	Aggregate score	Mean	SD	Rank
i.) EMPLOYMENT					
Availability of skilled manpower	92	65	0.71	0.53	7
Growth in wages	86	32.2	0.37	0.46	10
ii.) PRODUCTION					

Contribution of wages & salaries	89	74.8	0.84	0.97	4
Contribution of raw material	90	69.2	0.77	0.85	6
Contribution of fuel & energy	90	85.20	0.95	1.61	2
Contribution of financial costs	87	62.4	0.70	0.80	8
Contribution of taxes	91	89.4	0.98	2.12	1
iii.) FACTORS AFFECTING PRODUCTIVITY					
Total factor productivity(TFP)	85	60.7	0.71	0.48	9
Range of increase for TFP	44	31.5	0.72	0.49	11
Range of decrease for TFP	50	21.5	0.43	0.61	12
Enhancement of labor productivity	88	81.5	0.93	1.1	3
Enhancement of TFP	80	73.5	0.92	1.1	5

Table 3 shows the aggregated score, mean, standard deviation and rank order in relation to identified activities towards productivity with butchers. In this stratum the top aggregate score of 33 (with a mean of 0.81) responded by identifying unavailability of skilled workforce as an issue of concern towards its total factor productivity. This observation is associated with well-trained flayers whose source of training is on the job training or wait for government led skills development programmes that are dependent to budgetary availability. At most with the speed of trying to flay as many animals as possible to boost their daily income, quality of hides and skins is comprised at this stratum. In contrast, most of the contributions associated with wages and salaries scoring 32.4 (mean of 0.83) in this stratum is directed towards staff and their emoluments. Major engagements are on those employed to run the administrative and financial aspects of the enterprise at this stratum. Thus, this provides the need of restructuring the approach to encompass quality conscious orientation to the flayers (persons engaged with removal of hides and skins from slaughtered animals). Appropriate consideration of the terms and conditions of the flayers would improve the quality of hides and skins in the value chain. The lowest response (ranked 12th) for this stratum as observed for producers also negated on reversing the TFP.

Table 3. Aggregated score, mean, standard deviation and ranking on identified activities towards productivity with Butchers

	Butcher value chain stratum				
Activities	**Number**	**Aggregate score**	**Mean**	**SD**	**Rank**
i.) EMPLOYMENT					
Availability of skilled manpower	41	33	0.81	0.72	1
Growth in wages	35	15.7	0.5	0.3	10
ii.) PRODUCTION					
Contribution of wages & salaries	39	32.4	0.83	1.1	2
Contribution of raw material	35	24.0	0.69	0.6	9
Contribution of fuel & energy	35	30.2	0.86	1.2	4
Contribution of financial costs	35	26.6	0.76	1.0	8
Contribution of taxes	34	28.8	0.85	1.5	5
iii.) FACTORS AFFECTING PRODUCTIVITY					
Total factor productivity(TFP)	35	31.67	0.91	1.1	3
Range of increase for TFP	28	11.0	0.40	0.4	11
Range of decrease for TFP	11	4.9	0.45	0.8	12

Enhancement of labor productivity	34	28.0	0.8	0.7	7
Enhancement of TFP	31	28.42	0.92	1.1	6

Table 4 shows the aggregated score, mean, standard deviation and rank order in relation to identified activities towards productivity with Traders. In this stratum the top aggregate score of 56 (with a mean of 0.80) illustrated the importance of the raw material's availability and its contribution to TFP. The enterprise's core activity at this level focuses on sourcing, storage and delivery of raw material to the tanners and to some export. As such proper sourcing skills which require sorting, selection and grading techniques are fundamental for the Traders survival in business (could easily make huge losses if staffs are unskilled). In this stratum, second ranked response was on availability of skilled manpower with a score of 54.67 (a mean of 0.78) which confirmed the importance of the activity. The lowest response (ranked 12th) for this stratum as observed for producers and butchers also provided the negation by traders on decreasing the TFP.

Table 4. Aggregated score, mean, standard deviation and ranking on identified activities towards productivity with Traders

Activities	Traders value chain stratum				
	Number	**Aggregate score**	**Mean**	**SD**	**Rank**
i.) EMPLOYMENT					
Availability of skilled manpower	70	54.67	0.78	0.63	2
Growth in wages	71	28.58	0.40	0.45	9
ii.) PRODUCTION					
Contribution of wages & salaries	70	48.40	0.70	0.65	6
Contribution of raw material	71	56	0.80	0.70	1
Contribution of fuel & energy	68	51.60	0.76	0.92	3
Contribution of financial costs	70	49.60	0.71	0.82	4
Contribution of taxes	69	49.4	0.72	0.76	5
iii.) FACTORS AFFECTING PRODUCTIVITY					
Total factor productivity(TFP)	60	39.3	0.66	0.35	7
Range of increase for TFP	26	10.75	0.41	0.28	11
Range of decrease for TFP	15	4.5	0.3	0.38	12
Enhancement of labor productivity	43	30	0.70	0.13	8
Enhancement of TFP	36	26	0.72	0.24	10

Table 5 depicts the aggregated score, mean, standard deviation and rank order in relation to identified activities to towards productivity with Tanners. In this stratum the top aggregate score of 7 (with a mean of 1) had responses that identified enhancement of TFP as a priority. This observation was crucial when considering the narrow profit margins eminent in semi-processing of leather. As such every effort to minimize on costs and optimize on productivity is essential to sustain the activities of the tanners in the value chain. The lowest response (ranked 12th) for this stratum as observed for producers, butchers and traders equally provided the negation by tanners on decreasing the TFP.

Table 5. Aggregated score, mean, standard deviation and ranking on identified activities towards productivity with Tanners

Activities	Tanners value chain stratum				
	Number	Aggregate score	Mean	SD	Rank
i.) EMPLOYMENT					
Availability of skilled manpower	7	4.0	0.57	0.29	9
Growth in wages	9	4.0	0.5	0.5	10
ii.) PRODUCTION					
Contribution of wages & salaries	7	5.8	0.82	0.9	5
Contribution of raw material	7	5.2	0.74	0.80	7
Contribution of fuel & energy	7	4.8	0.70	0.70	8
Contribution of financial costs	7	5.4	0.77	0.93	6
Contribution of taxes	7	6.6	0.94	1.6	2
iii.) FACTORS AFFECTING PRODUCTIVITY					
Total factor productivity(TFP)	7	6.3	0.90	1.6	4
Range of increase for TFP	5	1.75	0.35	0.11	11
Range of decrease for TFP	2	0.75	0.35	0.41	12
Enhancement of labor productivity	7	6.5	0.93	1.1	3
Enhancement of TFP	7	7	1	1.4	1

Table 6 depicts the aggregated score, mean, standard deviation and rank order in relation to identified activities towards productivity with Footwear. In this stratum the top aggregate score of 11 (with a mean of 0.92) had responses that identified enhancement of TFP as a core. This observation was important when considering the highly competitive environment the stratum operates with imports of second hand and low quality footwear into the country. Moreover, the need for availability of skilled manpower had high response (third ranked with a score of 10.67 and a mean of 0.7) for purposes of ensuring productivity in the stratum. Therefore, aspect of designing footwear and ultimate workmanship on final product is dependent on appropriate skills and its availability. The lowest response (ranked 12th) observed for this stratum was similar to producers, butchers, traders and tanners which denoted a negation by Footwear towards decreasing the TFP.

Table 6. Aggregated score, mean, standard deviation and ranking on identified activities towards productivity with Footwear

Activities	Footwear value chain stratum				
	Number	Aggregate score	Mean	SD	Rank
i.) EMPLOYMENT					
Availability of skilled manpower	14	10.67	0.7	0.64	3
Growth in wages	11	4.86	0.44	0.57	11
ii.) PRODUCTION					
Contribution of wages & salaries	14	11.0	0.79	0.73	2
Contribution of raw material	12	6.70	0.58	0.40	10
Contribution of fuel & energy	11	9.0	0.82	1.11	7
Contribution of financial costs	12	8.40	0.70	0.75	8
Contribution of taxes	12	10.0	0.84	1.10	5
iii.) FACTORS AFFECTING					

PRODUCTIVITY					
Total factor productivity(TFP)	12	10.0	0.83	1.10	6
Range of increase for TFP	13	7.25	0.6	0.61	9
Range of decrease for TFP	6	4.0	0.67	0.5	12
Enhancement of labor productivity	12	10.5	0.88	0.8	4
Enhancement of TFP	12	11.0	0.92	1.1	1

Table 7 depicts the aggregated score, mean, standard deviation and rank order in relation to identified activities towards productivity with Leathergoods. In this stratum the top aggregate score of 14.6 (a mean of 0.81) had responses that identified level of wages and salaries to have an effect towards TFP. In this stratum there is top flight of workers being lured to other competitors. Furthermore, the employment approach encompasses one engagement of staff partly on permanent basis and others as casuals depending on work load and demand. This predisposes the stratum to affect TFP and increase uncertainty to its operation. To mitigate on this dilemma the stratum players are compelled to reviewing the staff wages to constantly motivate them for purposes of maintaining retainability. The same stratum also responded strongly on focusing on TPF with a score of 14 (and a mean of 0.88) with other results there in demonstrating close tied ranks. The operational environment is similar to the footwear with flooding imports (second hand and low quality leather goods) distorting the market competitiveness. The lowest response (ranked 12th) observed for this stratum was similar to producers, butchers, traders, tanners, and footwear which illustrated opposition of leather goods stratum towards decreasing the TFP.

Table 7. Aggregated score, mean, standard deviation and ranking on identified activities towards productivity with Leathergoods

	Leathergoods value chain stratum				
Activities	**Number**	**Aggregate score**	**Mean**	**SD**	**Rank**
i.) EMPLOYMENT					
Availability of skilled manpower	16	12.33	0.77	0.60	8
Growth in wages	16	8.43	0.53	0.43	10
ii.) PRODUCTION					
Contribution of wages & salaries	18	14.6	0.81	1.1	1
Contribution of raw material	18	11.4	0.63	0.55	9
Contribution of fuel & energy	17	12.8	0.75	1.24	7
Contribution of financial costs	17	14.0	0.82	0.96	3
Contribution of taxes	17	14.0	0.82	1.4	3
iii.) FACTORS AFFECTING PRODUCTIVITY					
Total factor productivity(TFP)	16	14	0.88	1.1	2
Range of increase for TFP	8	4.5	0.56	0.66	11
Range of decrease for TFP	2	1	0.5	1	12
Enhancement of labor productivity	17	14	0.8	0.7	4
Enhancement of TFP	17	14	0.8	0.7	4

Table 8 details the differences in productivity activities in the Leather strata, summary Information, ANOVA, pairwise mean differences and related probabilities (n=72). The ANOVA and means matrix was used to make the computations required to run the analysis of

variance and multiple comparison of the leather strata. As seen in this table, the ANOVA p value of 0.000 illustrated that at least one pairwise set of means are not equal. From the means matrix the inference is that all the strata in the leather value chain were significantly different except means between Tanners and Footwear (p=0.4545), Tanners and Leather goods (p=0.2080) and Footwear and Leather goods (p=0.6054). The R^2 (square) value indicated in Table 8 suggested that 74.13% of the strata's variation is explained by the identified productivity activities.

Table 8. Productivity activities in the Leather strata summary Information, ANOVA, pairwise mean differences and related probabilities (n=72)

Summary Information	Producer	Butcher	Trader	Tanner	Footwear	Leather goods
Count	12	12	12	12	12	12
Mean	62.213	24.560	37.405	4.848	8.639	55
Standard Deviation	22.380	9.106	17.371	1.948	2.394	4.382
UC (2-sided, 95%, pooled)	69.328	31.674	44.519	11.962	15.754	18.370
LC (2-sided, 95%, pooled)	55.098	17.445	30.290	-2.267	1.525	641
ANOVA Table						
Source	**SS**	**DF**	**MS**	**F**	**p-value**	
Between	28817	5	5763.3	37.823	**0.0000**	
Within	10057	66	152.37			
Total	38873	71				
Pooled Standard Deviation =	12.344		**R-Sq =**	74.13%		
DF =	66		**R-Sq adj. =**	72.17%		
Pairwise Mean Difference (row - column)	**Producer**	**Butcher**	**Trader**	**Tanner**	**Footwear**	**Leather goods**
Producer	0	37.653	24.808	57.365	53.574	50.958
Butcher		0	-12.845	19.712	15.920	13.305
Trader			0	32.557	28.765	26.149
Tanner				0	-3.791	-6.407
Footwear					0	-2.616
Leather goods						0
Pairwise Probabilities	**Producer**	**Butcher**	**Trader**	**Tanner**	**Footwear**	**Leather goods**
Producer		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**
Butcher			**0.0131**	**0.0002**	**0.0024**	**0.0103**
Trader				**0.0000**	**0.0000**	**0.0000**
Tanner					0.4545	0.2080
Footwear						0.6054
Leather goods						

4. Discussion of Results

The research basis of the study was concerned with productivity as measured in the leather strata in Kenya. In considering employment in the leather strata, derived data indicated progressive increase in employment from 2004/05 (12.29%) towards 2012/13 (21.29%). According to Budd (2004; 2013), employment forms a fundamental balance between economic efficiency and social equity. Following this inclination, the stratum with the highest response on employment creation and was congruent were the Tanners with employee numbers averaging 34 per year (2004-2013).

In another observation with a deeper perspective to employment, Dalgin, (2010) focused on both intra and inter relationship that relate to key socio-economic indicator and demonstrated how fundamentally employment was linked to revenue earnings, number of operational units, and productivity along the value chains. Thusly, in tandem to the study results this epitomized the importance of leather processing by the Tanners and their contribution in the leather strata through high employment in comparison to other stratums and inherent accruals achievable. However, irrespective of the gains in employment, further analysis of the study showed that the upper stratums (Tanners, Leathergoods and Footwear) which have major impact to the value chain in productivity had constraints that required attention. This included unavailability of skilled manpower and skills development institutions in the country particularly in artisan level. For instance, the Footwear drew their semi-skilled personalities from operating cobblers, poached from operational enterprises, unoccupied artisans or from wound-up footwear companies. Gale (2012) and Mwinyihija (2010) affirmed that lack of initiatives towards value addition is influenced with lack of skills, and abject investment opportunities which if not addressed could easily propel the sector's problems to unimaginable levels.

The study had also other interesting results which demonstrated that the leather strata on overall showed 11-25% financial costs contributed towards production in the value chain. The importance of this observation was closely related to the mode of payment associated with the leather strata which encompasses cash on delivery (COD) to all hides and skins delivered to the traders and tanners. The same applies for leather bought by Footwear and Leather-goods stratums. Moreover, tanners' exports are based on Freight on Board (FOB) bank certification mode for the release of their payment including other payment arrangements. Thus, the tanners to administer this approach of conducting business experience certain hurdles. This essentially includes servicing of credit facilities, overdrafts and loans which as a result contribute mostly to increased financial costs that impact towards the leather production.

Total Factor Productivity (TFP) which according to Dettori, Marrocu, and Paci (2012) captures how efficiently inputs are utilized and is integral to project competitiveness. During the study on overall, the leather strata response (44.44%) on these issues indicated that factors affecting productivity increased. Butchers (71.43%) and Tanners (71.43%) had the highest responses affirming an increase in total factor productivity. It is imperative to consider also

the market conditions available to these stratums as a major factor impacting on the amount of output produced and thereby affecting TFP of the leather strata in general. The two stratums were characterized with operations influenced with high demand of their products, low competition and readily available markets for their products (i.e. Meat and semi processed leather) at most. As such an opportunity to increase on their TFP was incentivized within their operational environment. Other studies by Hattingh, Russo, and Sun-Basorun (2013) forecasted that consumption potential in leather goods and footwear in the continent would register continued growth if sustained.

In a precautionary note to TFP, Kim and Shafi'l, (2009)   indicated that the extent that one firm manages its materials inventory through the organization of its labour force, technology acquisition, and the supply chain to final consumers more efficiently than another, will potentially determine the increased sales per unit factor input compared to other firms that are not complying. This is what will yield increased total factor productivity. Indeed, failure for the leather stratums to attain productive use of its factors and other inputs will render them negatively in containing the costs or generate adequate value-addition pulses in their stratums to have competitive advantage production.

Tanners had the highest responses (60%) depicting TFP increase of 1-5%. This observation supports the activity of the Tanners in value addition and the need to optimize on productivity to be competitive and profitable. The anticipated increase on this stratum in particular is geared towards finishing of their semi products by exploring on this opportunity. The impact of this transformation through appropriate policies and investment initiatives would benefit the leather-goods and footwear stratum that currently are experiencing deficiency in adequate supply of finished leather. In support of this observation Sharma, Pathania, & Lal (2010) indicate that in certain countries in Africa, there is momentum to evolve policy towards value addition of their commodities, a critical necessity that should include the leather sector.

Productivity activities in the Leather strata was analyzed using ANOVA and means matrix to make the computations required to run the analysis of variance and multiple comparison of the leather strata. As such, the result yielded ANOVA p value of 0.000 that all the strata in the leather value chain related to productivity activities were significantly different. The exception on the means comparison was between Tanners and Footwear (p=0.4545), Tanners and Leather goods (p=0.2080) and Footwear and Leather goods (p=0.6054). This was an important result as it illustrated that there is a statistically significant difference between value chains and productivity as measured in the leather sector strata in Kenya.

5. Conclusion

The study related the essence of productivity of the leather strata in Kenya with the inherent factors that are prerequisite to value addition. Generally, the activities along the leather value strata that provided insight to aspects impacting towards productivity varied and included availability of skilled manpower, growth in wages and salary, raw material availability, TFP etc. Indeed, the study was in tandem with the reviewed global opinion on factors influencing

productivity where efficient organization of leather strata labour force, technology acquisition, and the supply chain to final consumers was found to be pertinent. The results indicated that for producers their major concern was about transport related and taxation issues. Skilled man power attributes as a challenge was shared amongst the slaughterhouse, traders, tanners and footwear. However, of key interest were the tanners who singled out the need to enhance TFP. This was positive as the study found out that failure for the leather stratums to attain productive use of its factors and other inputs will render them impotent in managing the costs or incapable of generating adequate value-addition initiatives to propel the stratums to competitive advantage. Thusly, in conclusion the evaluation of productivity responses from the leather value chain strata in Kenya was significant and successful in providing a potential to resolving the sector's problem and articulating pathways for improving performance.

Acknowledgement

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