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Innovation and Micro and Small Enterprises Growth Performance: Evidence from Kenya

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Abstract: *The role that innovation can play towards the growth and survivalof an enterprise continues to gain credence as better indicators of enterprise innovativeness come to the fore. In spite of this growing body of knowledge, micro and small enterprises in Kenyacontinue to experience high mortality rate. This paper used World BankEnterprise Survey data for Kenya to probe whether innovative micro and small enterprisesare indeed associated with better growth performance. The study used a qualitative analysis using a descriptive analysis and t-test for mean differences to compare innovative and non-innovative micro and small enterprises. The results show that there was no statistically significant relationship between a micro and small enterprise's growth performance and its innovativeness. Innovative micro and small enterprises were, however, found to have invested relatively higher resources towards innovation inputs and hiring of advanced human skills. They also participated in export trade. The results seems to suggest that innovative micro and small enterprises' investment were either too marginal to make a difference or the investments dissipated along the innovation chain.*

Key words*: Micro and Small Enterprises; Innovativeness; Growth Performance*

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I. Background

An enterprise's innovativeness plays a positive role towards its growth and survival prospects(Minitti, 2008; McCormick & Maalu, 2011; Audretsch, Coad & Segara, 2014). Indeed, Minitti (2008) and Ainin, Kamarulzaman and Farida (2010), argue that innovation is also an important ingredient for enterprises competitiveness. Cressy (2006) in a similar line of argument suggests that innovative enterprises grow faster in terms of sales turnover and employment creation. This is because, innovative enterprises are able to adopt new technology with relative ease thereby improving their productivity and growth. Thus even among micro and small enterprises (MSEs), innovationshould enhance their survival chances even in the presence of large firm dominated sectors (Cressy, 2006). From this perspective an MSE's innovativeness becomes an asset for it to increase its growth prospects (Ainin, *et al.,* 2010; Nguyen & Jaramillio, 2014**).**

According to OECD (2005) innovation can emerge as an original idea, a diffusion, absorption or imitation of new methods or processes developed elsewhere. Innovation can be grouped into two major categories that encompass technological and non- technological innovation (OECD, 2005). Technological innovation includes product innovation, which entails introduction of products that are new to the firm and process innovation, which involves introduction of new production or delivery method. Non-technological innovation on the other hand includes marketing and organisation innovation. Marketing innovation entails implementation of marketing methods that are new to the firm while organisational innovation encompasses introduction of new business practices, workplace organisations and external relations that are new to the firm (OECD, 2005; Mohnen & Hall, 2013).

According toMel and Woodruff (2009), however, lack of appropriate indicators to capture innovative activities amongst MSEs has led to a paucity of empirical innovation studies. Hall, Lotti and Mairesse (2008) argue that MSEs innovation activities mostly lie outside the ordinary research and development activities and patent counts. This makes its empirical measurement even more difficult. Yet knowledge on the relationship between an MSE's innovation and its chances of growth can be useful in designing policies that facilitate growth of such enterprises (Mel & Woodruff, 2009). As a result of the problematic measurement of MSEs innovation activities there is a risk of underestimating innovation and its role towards the growth of MSEs. McCormick and Maalu (2011) and United States Agency for International Development [USAID, 1989] argue that in Africa where MSEs are often fragmented, the underestimation problem becomes even more pronounced.

In Kenya MSEs continue to be characterised by low survival and growth rates. A recent survey found that in span of about five years between 2011 and 2015, 2.2 million MSMEs ceased operation (RoK, 2016). According to the Survey, an average of 46 per cent of the 2.2 million MSEs ceased operation within the first year (RoK, 2016). The high MSEs closure rates suggests low survival rates among MSEs. Taking employment numbers as a basic indicator for enterprise growth, Kenyan MSEs face constrained growth prospects. The Survey for instance reported that the average number of employees at inception, at peak and at closure for 2.2 milion closed MSEs did not vary significantly. According to RoK (2016), the average number of employees at inception for the closed MSEs was 1.4 employees. This number rose to 1.6 employees at peak of the MSEs growth and dropped back to 1.4 employees at closure.

In spite of the role that innovation plays towards the growth of enterprises, relatively few MSEs engage in innovation.In Kenya, attempts have been made to measure enterprise innovation activities. For instance, RoK (2016) analysedvarious aspects of enterprises innovativeness. With respect to MSEs one of the findings was that only 19.4 per cent of licensed MSEs engaged in innovation activities. From the Survey it was however not clear whether innovative MSEs experienced better growth prospects than non-innovative MSEs. The objective of this paper was therefore to investigate whether there existed statistically significant growth differences between innovative and non-innovative MSEs in Kenya.

II. Literature Review

Theorical work on the relationship between innovation and enterprise growth can be glimpsed from the endogenous growth theory. For instnace, theories advanced by Romer (1990) and Aghion and Howitt (1992), view enterprise growth as an internally generatedoutcome within an economic system (Romer, 1994). According to these theorists, at the micro-level, profit-maximizing firms engage in production of knowledge through such activities as research and development and other innovation activities. In this manner, they endogenize knowledge production. The resultant innovation possess spillover effects that reduces the diminishing returns to capital and thus contributing to further entreprise growth. According to Acs, Audretsch, Braunerhjelm and Carlsson (2003)introduction of new technologies and processes should thus lead to an enterprise growth.Hall (2011) argues that an enterprise's innovativeness takes into account the ability of a firm to transform knowledge capital or innovation inputs such as training, equipment, research and development into innovation outcomes. This ability gives rise to issuance of new patents; introduction of new and improved products, new production processes, new organizational changes and new marketing innovations by the innovative MSEs. According to Minitti (2008) such innovative undertakings aids an enterprise to move to higher return activities and eventually facilitate a graduation from a MSE to medium and then to a large enterprise. Minitti (2008) posit that the graduation then leads to creation of more and higher quality employment opportunities as well as improved products and service thereby enlarging the markets for MSEs. While innovation needs to be significantly new to a firm, it need not be new to the market to have an impact on a firm's growth (Fu, Mohnen & Zanello, 2016). According to Hall (2011), firms invest in knowledge capital inputs to increase their innovativeness. The innovation capabilities are then used to produce innovative outcomes. Whether a firm's investments in knowledge capital translate into innovation outcomes, however, depends on the innovation capability of the individual firm.Audretsch, *et al*.,(2014) conludes that an MSEs' innovativeness is expected to generally have a positive influence on its survival and growth in sales turnover. The authors, however, argue that the overall impact on the MSE's employment level is ambiguous. This is because innovation is usually associated with increase in labour productivity leading to a displacement effect, especially for unskilled labour. Empirical work by Hall, *et al.,* (2008)that used a variant of the knowledge production function approach pioneered by Crepon, *et al.,* (1998) studied the link between innovation and firm growth.The study found that SME innovation activity had a positive impact on SMEs growth.Process innovation impact, measured through investments expenditures, was found to have a larger productivity impact than product innovation. Subrahmanya, Mathirajan and Krishnaswamy (2010) probed the likely impact of innovation on SMEs' growth in Bangalore, India in 2007. Growth of SMEs in the study was viewed in terms of sales turnover, investments and employment.The study found that SMEs that are innovative perform better in terms of sales turnover and employment generation relative to firms that are non-innovative. The firms that experienced the highest growth are the same enterprises that accounted for higher share of innovation products in their total sales when compared to those that experienced lower sales growth. Recent studies on innovatiness and growth of MSEs within Africa demonstrate mixed results. For instance the empirical work by Gebreeysus (2009), Robson, Haugh and Obeng (2009) and Fu, *et al.,*(2016)have found mixed relatioship between MSEs' innovativeness and these enterprises growth perfromance. While Gebreeysus (2009), and Fu, *et al.,*(2016) found that in genral MSEs innovativeness is generally associated with higher MSE's growth, Robson, Haugh and Obeng (2009) found no statistically relatioship between innovation and MSE's growth in Ghana. In Kenya, studies by Walobwa, *et al*., (2013) on the link between MSE's growth and innovation show that indeed innovativeness enhances the growth prospects of MSEs. In another Kenyan study by Kiraka, *et al.,* (2013)

MSE's innovatiness was found to be confined to introduction of a new product in the period immediately after the MSE had accessed credit assistance.From existing literature, both theoretical and empirical, it seems that statistically significant growth performance differences should exist between innovative and non-innovative MSEs.Such a result suggests an important role that innovation plays in the growth performance of MSEs.

III. Study Approach and Data

This paper adopted a qualitative approach using descriptive analysis and mean comparisons tests. The study in particular tested whether there was statistically significant difference in the growth performance between innovative and non-innovative MSEs. The data used in this study was extracted from the World Bank Enterprise Survey (ES) and the Kenya Innovation Follow-up Survey (World Bank, 2013).The data was collected by the World Bank in 2013 through stratified sampling techniques and was nationally representative. The survey used the Kenya National Bureau of Statistics (KNBS) 2012 Census of Business Enterprises comprising of 6,147 firms that had more than five employees and another 3,717 firms with five or less employees. Out of the total firms in the Census, the 2013 survey interviewed 720 firms with more than five employees and another 360 firms with five or less employees. The survey's unit of study was the physical establishment where the enterprise owner/operators were interviewed. For purposes of this study, the two surveys were merged using the common variable referred to as "idstd". The data on MSEs was extracted by specifying for enterprises that had 1 up to 50 employees in 2010 in line with the definition of an MSE in RoK (2005).

For purposes of this paper, the growth performance of an MSE was measured through two variables. The first one was through percentage changes in number of full employees between the years 2010 and 2012. Justification for this measure was premised on the fact that a growing enterprises especially in Africa is usually associated with employing more workers as labour is more abundant than other factors of production. The second measure was through percentage changes in total sales turnover between the years 2010 and 2012.

IV. Results and Discussions

Table 1 present descriptive summary statistics for some of the continuous and count variable that were used in the study. The summary statistics presented include the number of observations, mean, standard deviations and the range. The total sample size for the study was 575 but due to missing observations, the maximum number of MSEs with complete data was 573. As shown in Table 1, the size of individual MSEs ranged between 1and 50 employees in 2010. Due to the growth of some of the MSEs during the three-year period, however, some MSEs had up to 210 employees by the end of 2012. While the average size of a MSE in 2010 was 16.1 employees, it rose to 18.1 employees by the end of 2012. The descriptive statistics measuring the growth of MSEs through changes in employment and changes in sales show that the mean growth rate in terms of employment was 0.15 per cent while growth in terms of sales averaged 4.22 per cent.

Table 1: Descriptive statistics for Continuous and Count Variables

Variable	Obs	Mean	Std. Dev.	Range	
				Min.	Max
Employment growth (%)	547	0.15	(0.48)	-0.714	3.33
Sales growth (%)	449	4.22	(41.62)	-0.991	749.00
Physical capital (Ksh)	447	37,400,000	(163,000,000)	0	2,600,000,000
Cost of R&D (Ksh)	16	823,617	(1,518,750)	0	5,500,000.00
Annual innovation expenditure per employee (Ksh)	520	191,648	(825,861.70)	0	9,000,000.00
Proportion of skilled fulltime employees (%)	235	0.0015	(0.0022)	0	0.02
Proportion of employees using computers (%)	406	26.83	(30.87)	0	100
Number of years with internet connection (yrs)	299	6.48	(4.69)	0	23
Total cost formal training (Ksh)	84	4,995,619	(43,600,0000)	70000	400,000,000
Average education years for production worker (yrs)	233	11.48	(3.68)	1	20
Number of fulltime employees (2010)	547	16.14	(12.89)	1	50
Number of fulltime employees (2012)	567	18.40	(19.55)	1	210

Variable	Obs	Mean	Std. Dev.	Range	
				Min.	Max
Age (yr)	552	19.73	(15.76)	1	85
Number of market competitors	138	13.94928	(45.96132)	1	500
Manager's experience (yr)	560	17.15714	(10.78163)	1	57

Source of Data: World Bank Database (2013)

The mean value of physical capital, which includes the value of land, buildings and equipment owned by the MSE was estimated at KSh 37,400,000 in 2012. This relatively high mean, however, masks the huge disparity in the ownership of physical capital by MSEs. Whereas some MSE were estimated to own zero physical capital, others owned physical capital valued at KSh 2,600,000,000. Such disparities illustrate the heterogeneous nature of the MSE sector in Kenya.

Expenditures on research, development and innovation related activities among the MSEs were found to be either relatively uncommon or under reported. Results in Table 1 show that only 16 or 2.8 per cent of the 573 MSEs reported having spent money on research and development. The mean annual expenditures on research and development was estimated to be KSh 823,617.10 .The finding on the small number of MSEs reporting research and development echoes the findings in the MSE Survey report for 2016. The survey established that MSEs' expenditures on all innovation related research and development activities accounted for only 0.3 per cent of MSE's total annual expenditures in 2015 (RoK 2016). The annual mean expenditures on innovation per employee or innovation intensity was estimated KSh 191,648.60. This variable includes expenditures on research and development, innovation related expenditures such as training of employees on innovation, purchases of innovation related equipment and purchases of patents and copyrights.

The results presented in Table 1 show that the proportion of skilled employees to total employees among MSEs was 0.15 per cent. The highest proportion of skilled employees by MSEswas estimated at 2 per cent. An average of 27 per cent of MSEs' employees reported to use computers regularly in their daily operations. On average, MSEs indicated that they had been connected to the internet for a duration of 6 years. These findings imply that MSE in Kenya mostly used unskilled labourers who rarely use information technology in their operations. This, therefore, limits the capability of MSEs to benefit from information technology knowledge flows that could be useful in spurring innovations within the sector.

The mean annual expenditure on formal training was estimated at KSh 4,995,619. Disparities of expenditures on formal training by MSEs were, however, relatively big with the lowest spending of KSh 7,000 while the highest spent KSh 400,000,000. With such skewed expenditures in a sector characterized by shortage of skilled workers, the sector is thus likely to continue being quite heterogeneous in terms of human skills development and distribution. Managerial experience was found to vary considerably. Some MSE managers were reported to have only one year's experience while other managers were reported to have an accumulated experience of 57 years in the particular sector. Table 4.1 shows that the mean number of years of experience by the managers was 17.1 years.

The descriptive statistics presented in Table 2 show that out of the 573 MSEs, 86 per cent reported to have carried out innovation activities during the period 2010-2012. This is a relatively high percentage when compared to the 30 per cent average for overall innovation incidence for Africa, 51 per cent for Europe and 40 per cent for Emerging economies (ILO, 2017). With regard to the various categories of innovation reported by the MSEs during this period, 64.5 per cent of the MSEs reported to have carried out product innovation, 75 per cent reported to have carried out process innovations, 53 per cent reported organisation innovations while 61.5 per cent reported to have carried out marketing innovations. Overall, this implies that MSEs carried out relatively high levels of all types of innovation.

Table 2 Descriptive Statistics for Discreet Variables

Variable	Measurement	Freq.	Percent
Decision to innovate	No	80	13.96
	Yes	493	86.04
	Total	573	100
Product innovation	No	202	35.5
	Yes	367	64.5
	Total	569	100

Variable	Measurement	Freq.	Percent
Process innovation	No	143	25
	Yes	429	75
	Total	572	100
Organization innovation	No	266	46.75
	Yes	303	53.25
	Total	569	100
Marketing innovation	No	219	38.49
	Yes	350	61.51
	Total	569	100
Physical location	Central	83	14.49
	Nyanza	78	13.61
	Mombasa	100	17.45
	Nairobi	241	42.06
	Nakuru	71	12.39
	Total	573	100
Legal ownership status	Shareholding listed	4	0.7
	Shareholding non-listed	77	13.9
	Sole proprietor	204	36.8
	Partnership	270	48.6
	Total	555	100
Access to Finance	Not obstacle	167	29.72
	Minor obstacle	168	29.89
	Moderate Obstacle	120	21.35
	Major Obstacle	66	11.74
	Severe Obstacle	41	7.3
	Total	562	100
Size category	Micro	262	47.9
	Small	285	52.10
	Total	547	100
Informal competition	No	206	37.66
	Yes	341	62.34
	Total	547	100
Affiliated	No	476	83.07
	Yes	97	16.93
	Total	573	100
Use Mobile Money	No	274	47.9
	Yes	298	52.1
	Total	572	100
Own source innov. Funds	Yes	309	80.89
	No	73	19.11
	Total	382	100
Commercial source innov. Funds	Yes	125	32.81
	No	256	67.19
	Total	381	100

Source of Data: World Bank Database (2013)

As shown in Table 2, the regional distribution of the sampled MSEs for this study indicates that Nairobi region had the largest proportion of MSEs with 42 per cent, followed by Mombasa region with 17.5 per cent. The Central region had 14.5 per cent, Nyanza region had 13.6 per cent while Nakuru region had 12.4 per cent. Analysis of the legal ownership structures of the MSEs indicated that 48.6 per cent were partnerships and 36.8 per cent were sole proprietorship. Approximately 13.9 per cent were shareholding companies that were not publicly listed while 0.7 per cent were shareholding companies that were publicly listed. Thus more than 85 per cent of MSEs fall within the partnership companies and sole proprietorship businesses. Less than one per cent were listed at the securities exchange.

The analysis on MSEs' access to finance presented in Table 2 show that 7.3 per cent of the MSE considered access to finance a very severe obstacle, while 11.74 per cent perceived access to finance a major obstacle to their operations. Overall, only 30 per cent of the MSEs perceived access to finance not as an obstacle. Table 2 show that 80.9 per cent of the MSEs surveyed use internal or own funds to finance their innovation activities while 19.1 per cent use externally sourced finances to fund their innovative activities.

On MSEs' external linkages, 16.93 per cent of the MSE indicated that they belonged to a larger group of firms while 83.07 per cent were not affiliated. Table 2 also show that 52.1 per cent of the MSEs used mobile money to carry out various transactions, while 47.9 per cent did not use mobile money to carry out transactions. Competition from informal or unregistered firms for their main products/services was reported by 62.3 per cent of the MSEs while 37.7 per cent did not report the presence of informal firms competition for their main product/service.

Table 3 presents a summary of the t-test for means difference for various variables for innovative and non-innovative MSEs. The p-values provides the test whether the means differences are statically significant or not. From the results, the growth performance in terms of employment and sales show that there was no statistically significant differences between innovative and non-innovative MSEs. Thus even though, innovative MSEs reported higher growth performance in terms of employment and sales, those difference were not statistically significant. This therefore seems to suggest the absence of any statistically significant relationship between an MSE's innovativeness and its growth performance in terms employment and sales.

Table 3: Test for means differences between innovative and non-innovative MSEs

Variable	**Innovative MSEs (1) N= 495**	**Non-Innovative MSEs (0) N=80**	**Difference (1-0)**	**P-Value**
	Mean (SD)	**Mean (SD)**		
Employment growth	0.16 (0.48)	0.106 (0.49)	0.054	0.368
Sales growth	4.751 (44.381)	0.412 (4.518)	4.339	0.473
Physical capital	39,300,000 (173,000,000)	24,300,000 (56,200,000)	15,000,000	0.524
Innovation expenditure per employee	222,921.1 (893,844.6)	20,153.5 (75,181.95)	202,767.60**	0.046
Proportion of skilled workers	0.00162 (0.00231)	0.0012 (0.00105)	0.000	0.375
Proportion of employees using computer	27 (31.141)	19.67 (28.884)	7.330*	0.067
Number of years with internet	6.445 (4.654)	7.088 (4.914)	-0.643	0.452
Annual cost formal training	5,368,974 (45,300,000)	142,000 (9,227.14)	5,226,974.00	0.779
Average years education for production level worker	11.653 (3.522)	10 (4.628)	1.653**	0.033
Fulltime employee (2010)	16.29 (12.845)	15.17 (13.237)	1.120	0.848
Fulltime employees (2012)	18.923 (20.29)	15.238 (14.177)	3.685	0.119
Age (Yrs)	20.162 (15.694)	17.513 (15.975)	2.649	0.174
Number of market competitors	14.902 (48.556)	6.133 (7.269)	8.769	0.487
Managers years of experience	17.386 (10.943)	15.763 (9.744)	1.623	0.224
Proportion of foreign ownership	6.057 (21.034)	5.065 (20.302)	0.992	0.699

Proportion of export sales	17.445 (34.108)	9.315 (28.026)	8.130**	0.049

Notes: N= Number of observations; SD=Standard deviation in parenthesis; Asterisk ** denotes level of significance at 5 per cent level, * denotes level of significance at 10 per cent level; P-Value is probability value
Source of Data: Own computation

In the case of innovation expenditure per employee however there was a statistically significant difference as the p-value was 0.046. This implies that at a 5 per cent level, innovative MSEs had higher levels of innovation intensity compared to non-innovative MSEs. The results thus suggest innovative MSEs value innovation and therefore invested more resources per employee towards innovation. Such investments may have been through resources such as computers. This is evident as the means differences for the variable for proportion of employees using computers was found to be statistically significant at a 10 per cent level in favour of innovative employees.

Another statistically significant difference was with regard to the variable for average number of years of education for a production level worker. Results in Table 3 show that innovative MSEs production level workers had more years of education on average. It was therefore evident that innovative MSEs had better skilled production level workers. Such skills may thus have accounted for the higher sales and employment growth performances though not statistically significant. Finally, with regard to export participation, the variable for proportion of export sales was higher for innovative MSEs compared to that of non-innovative MSEs and the mean difference was statically significant at 5 per cent level.

V. Summary and Conclusions

In summary, this paper concludes that even though, there was no statistically significant differences in the growth performance of innovative and non-innovative MSEs, the innovative MSEs seemed to have had higher growth performance in terms of both employment and sales relative to non-innovative MSEs. The insignificant resultsmaythus be an indication that the level of innovativeness was not radical enough to stimulate statistically significant growth in employment and sales. This results therefore points to the imitation type of innovation which characterise MSEs in Kenya. This level of innovation only allows MSEs to survive by copying each other. It is, however, is not radical enough to enable MSEs to employ more workers and increase their sales. The second, conclusion was that for innovative MSEs, even with their substantial investments in innovation expenditures on higher computer equipment per employee and hiring of better skilled workers, such investments have not translated into statistically significant growth performance. This result may be a pointer to a dysfunctional innovation system for MSEs or low innovation capabilities both of which constrain MSE's innovativeness. It may be prudent thus to put in place strategies for improving innovation capabilities among MSEs. One such strategy should aim at ensuring MSEs participate in exported trade, improve education skills levels for production level workers and make computers more accessible to MSEs. The findings of this paper are, however, limited given that the study approach used was correlational and therefore no causal effects can be attributed to any of the study variables.

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