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The Contribution of Technology
Adoption on the Growth of
SMALL AND MICRO-ENTERPRISES
Growth in Kenya

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Full Length Research

The Contribution of Technology Adoption on the Growth of Small and Micro-Enterprises Growth in Kenya

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Despite the many startups and government effort to improve the regulatory and institutional framework in Kenya, most Small and Micro Enterprises (SMEs) do not evolve into medium enterprises. This paper sought to determine contribution of technology adoption on the growth of SMEs. The research design employed was the descriptive cross sectional design that used a purposive survey. The study targeted SMEs situated in Nairobi City and operating in four sub-sectors of the economy namely: transportation and storage; accommodation and services activities; information and communication; financial and insurance activities; and professional, scientific and technical activities. A total of 395 SMEs were sampled using stratified technique and response rate registered was 88.1%. Primary data were collected through questionnaires administered on owners and managers of SMEs by the researcher by way of structured interviews. Secondary data were collected through documentary reviews. In order to guarantee validity and reliability of the primary data collected, the instrument was constructed against the background of the specific research objectives and tested through experience surveys. Data analysis procedures were carried out and the data coded before running the initial summaries in the Statistical Package for Social Sciences (SPSS). For the qualitative data, simple listing of suggestions, factors and other itemized variables was adopted. Chi-square test of association at a 5% level of significance was used to explore the relationship between variables. While the respondents were in agreement on the importance of technology, there was very low usage, attributed to lack of resources, awareness and training. Entrepreneurial training programs should be developed as part of the national school curriculum as well as development of training programs for SMEs which should include awareness on business ethics and tendering procedures.

Keywords: SMEs, technology, growth

INTRODUCTION

It has been widely acknowledged that Small and Micro Enterprises (SMEs) play a very crucial role in most world economies but particularly in emerging and developing economies with major employment and poverty challenges (Kongolo 2010). The establishment and development of SMEs are vital to the well-being of economies of developing countries and failure to nurture the growth of SMEs can pose a serious risk to governments' poverty reduction strategies (Fatoki and

Garwe 2010). One of the most defining characteristics of a growing economy is successful and thriving Small and Micro Enterprise sector. With the advent of the developing countries and their integration to the world economy, it is now generally accepted that the next wave of globalization and economic growth will be driven by SMEs (Eriksson et al. 1997).

SMEs contribute to economic development and prosperity of a country in many distinguished ways: job

creation and employment for both rural and urban populations, by stimulating innovation and inspiring entrepreneurship especially in the emerging market countries. Further a large proportion of populations in emerging economies depend on SMEs either directly or indirectly. SMEs have a significant impact on the socio-economic situation of any country and play an important role on social income distribution, widening of tax revenue base, stability of family income by supporting job creation (McPherson 1996). Further, (Advani 1997) agrees that from a growth economic perspective, SMEs provide the stimulus that is needed to accelerate economic growth confirming that a well-structured and developed SME sector is likely to support economic growth in the same manner as large corporations (Abraham 2003).

Although precise information on the number of SMEs is hard to ascertain, it was estimated that 95% of business enterprise are SMEs accounting for over 65% of all jobs in the private sector (Ayyagari, T and Dermiguc-Kunt 2007). Japan is considered as the country with the highest number of SMEs with over 95% of all businesses being SMEs whilst India had more than 13 Million SMEs in 2008 which constituted 80% of the total businesses. This trend is repeated in all major emerging markets of China, Malaysia and Brazil. In these large emerging market economies, SMEs dominate the economic activity (Tang, Paul and Yuli 2007). In EU, it is estimated that SMEs make up 99% of all companies and employ well over 65% of all the labour force.

Many developing countries in Africa are known to have a large and growing SME sector. In Kenya, the SME sector plays a key role in the national economic development. As a key engine for growth, SME sector is acknowledged as the biggest employer outside the traditional agriculture sector. According to Economic Survey (Economic Survey 2014), SME share of total employment has increased from 48% a decade ago to more than 68% currently. Another study by (Bowen, Morara and Mureithi 2009) showed that this sector contributed 50% of all new jobs in 2005, and grew to over 65% of job creation in 2012 with overall contribution of 20% of the country's GDP. This phenomenal growth in the share of job creation by SME sector has increased government focus on the development of this sector as a key driver for economic growth, new job creation and poverty reduction. This is in line with the government's focus of prioritizing the private sector as the key enabler in future growth and poverty reduction strategy.

Despite government effort to improve the regulatory and institutional framework in Kenya, much more work needs to be done especially in the areas of coordination of government implementing agencies. Equipping SME owners and managers with management and entrepreneurial skills will enhance their ability to surmount the barriers to growth and this will lead to sustainable development. A combination of formal

entrepreneurial on-job training, coaching and support is a crucial undertaking that lays the solid foundation for success (Ladzani and Van Vuuren 2002).

The development of innovative mobile bank platforms such as MPESA in Kenya and the adoption of mobile payments, whereby businesses can both make and receive payments using electronic wallets stored on mobile phones have enabled many SMEs to lower their transactions costs and reach a wider customer base. According to (Schulze 2014), mobile payments amount to over 40 per cent of Kenyan GDP, despite the concept only having been introduced in the country as recently as 2007. Further Horne, (Horne, Nickerson and DeFanti 2015), suggest that small business revenue, incomes and their ability to employ more people increase in direct proportion to the use of mobile payment platforms in the process creating a strong opportunity for growth and expansion. Whereas this technology platform lowers the overall cost of transactions, SMEs require considerable upfront investment in systems and training to facilitate seamless transactions with both consumers and suppliers which sometimes can be a challenge to those SMEs struggling to raise capital for their operations. SMEs located in remote areas of the country encounter problems because of lack of reliable mobile telephone networks.

METHODOLOGY

The research design employed qualitative and descriptive cross sectional design that used a discriminative/purposive survey to obtain the empirical data to determine the linkages between variables. A cross-sectional survey design collects data from a target population at a point in time. Data was collected from various cases at the same time - although the time taken to collect the data span over more than one month.

The total population consisted of 113,034 registered SMEs in Nairobi city, Kenya, cutting across the following sub-sectors: Agriculture, forestry and fishing; Mining and quarrying; Manufacturing; Wholesale and retail trade, repair of motor vehicles and motorcycles; Transportation and storage; Accommodation and food service activities; Information and communication; Financial and insurance activities; Professional, scientific and technical activities; Education; Human health and social work activities; and Arts, entertainment and recreation sectors.

The Study targeted the following sub-sectors due to their accessibility and ease of data collection: Transportation and Storage; Accommodation and services activities; Information and communication; Financial and insurance activities; Professional, Scientific and technical activities. The SMEs in these sub-sectors were a total of 31,943 (Table 1).

The study categorized the SMEs into various sectors under the target population. Due to the differences in the various sectors, total representation was determined by the use of stratified random sampling procedure where

Table 1: Distribution of the samples

SN	SME Sector	Total number	Sample
1	Transportation and storage	5,566	69
2	Accommodation and food service activities	8,804	109
3	Information and communication	668	8
4	Financial and insurance activities	1,468	18
5	Professional, scientific and technical activities	15,437	191
	Total	31,943	395

proportional allocation was employed to draw samples in the different SME sectors.

The sample size was determined by the Yamane (1967) formula:

$$n = \frac{N}{1 + N(e^2)}$$

Where, N is the size of the target population and e is the allowable error (in our case $e = 5\%$). This gives:

$$n = \frac{31,943}{1 + 31,943(0.05^2)} = 395$$

This was shared across the sectors as shown in table 1.

The validity of the information collected by the questionnaire was checked by running a pilot study. According to (Baker, 1994), pilot study can be the pre-testing or 'trying out' of a particular research instrument. The merit underpinning the pilot study is that the pilot study may highlight the weakness in the data collection instrument before embarking into the actual data collection, thereby giving an opportunity to revise the tool. The anomalies pointed out were corrected before the actual data collection exercise and they aided in reducing the ambiguities in the questionnaire which resulted in a very low degree of non-response.

Associations between the above statements and the growth variables were tested using the Chi-square test (of association at 5% level of significance. Again the Chi-square test which is a non-parametric test was preferred to its parametric counterparts due to the nature of the data. The Chi-square was preferred because it dealt with categorical data and the aim was to arrive at the associations between the dependent variable, that is, SME growth, and the independent variables.

The collected data was a mix between the categorical and narratives from the closed and open-ended questions, respectively. Data analysis procedures started by examination of the collected data in order to check for data collection and entry errors; that included entries that were miss-spelt, and not captured from the question detail. The data was then coded before running the initial summaries. For the five-point Likert scale questions that were grouped into each of the variables under study, modes were obtained in order to arrive at a single observation per respondent. This is a highly-

recommended measure, together with medians, than the counterpart, the mean, that is applied for quantitative continuous data. The modes gave a general pattern from the sections and so the following statement was drafted: Technology adoption is a major boost to the success of the SME business.

The statement aided in achieving the main aim of the research. The general statement was then cross tabulated together with the variables measuring the growth of SMEs, that is, production/output/volumes, profitability and workforce. Associations between the above statements and the growth variables were tested using the Chi-square test (of association at 5% level of significance. The Chi-square was preferred because it dealt with categorical data and the aim was to arrive at the associations between the dependent variable, that is, SME growth, and the independent variables, that constituted the different variables from the hypothesized constructs. It was the most suitable test for this kind of data given that it used the Chi-square, a non-parametric test that does not make any strict distributional assumptions but it can give a concrete measure of association.

RESULTS AND DISCUSSION

The response rate for the study was 88.1%. The proportion of technology adoption with age groups as given in table 2 do not differ significantly (Chi-square value = 2.246, $df = 4$, p -value 0.691). This means that the different age groups have embraced technology in equal measures with more of them using as compared to those who don't use any form of technology.

When asked how they use the internet, the following emerged: electronic mail, researching for business opportunities, buying goods and services online, and staying up to date with business trends. Majority (37.6%) were researching for business opportunities on line; followed by buying goods and services (29.4%) while 23.5% of the respondents spend their time updating themselves about the emerging business trends. Table 3 gives the distribution of those enterprises had websites with the age group of the owner. The proportions therein did not differ significantly (Chi-square value = 7.248, $df = 4$, p -value 0.123) across the different age categories that pointed towards low website acquisition.

Relationship between technology adoption and the growth aspects of SMEs were explored in tables 4, 5 and

Table 2: Respondents age groups and computer literacy

Respondents' Age	Are you computer literate?		Total
	Yes	No	
Below 21 years	72.70%	27.30%	100.00%
21-30 years	79.50%	20.50%	100.00%
31-40 years	82.70%	17.30%	100.00%
41-50 years	86.40%	13.60%	100.00%
Above 50 years	91.70%	8.30%	100.00%
Count	261	60	321
% within the group	81.30%	18.70%	100.00%

Table 3: Respondents age group distribution and whether they have a website

Respondents' Age	Does your enterprise have a website?		Total
	Yes	No	
Below 21 years	30.00%	70.00%	100.00%
21-30 years	28.80%	71.30%	100.00%
31-40 years	17.50%	82.50%	100.00%
41-50 years	21.10%	78.90%	100.00%
Above 50 years	0.00%	100.00%	100.00%
Count	71	229	300
% within the group	23.70%	76.30%	100.00%

Table 4: Relationship between technology adoption and production/volume/output

Over the last one year, your production/volume/ output has	Technology adoption is a major boost to the success of the SME business.					Total
	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	
Increased	32.40%	53.80%	4.00%	5.80%	4.00%	100.00%
Decreased	0.00%	75.00%	6.30%	18.80%	0.00%	100.00%
Remained constant	25.60%	53.80%	5.10%	12.80%	2.60%	100.00%
Total Count	99	181	14	24	12	330
% within the group	30.00%	54.80%	4.20%	7.30%	3.60%	100.00%

Table 5: Relationship between technology adoption and profitability

Over the last one year, your profit has	Technology adoption is a major boost to the success of the SME business.					Total
	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	
Increased	32.60%	53.90%	4.30%	6.00%	3.20%	100.00%
Decreased	13.00%	69.60%	4.30%	13.00%	0.00%	100.00%
Remained constant	20.00%	52.00%	4.00%	12.00%	12.00%	100.00%
Total Count	100	181	14	23	12	330
% within the group	30.30%	54.80%	4.20%	7.00%	3.60%	100.00%

Table 6: Relationship between technology adoption and workforce

Over the last one year, your work force has	Technology adoption is a major boost to the success of the SME business.					Total
	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	
Increased	38.60%	51.60%	1.10%	6.00%	2.70%	100.00%
Decreased	7.40%	55.60%	22.20%	11.10%	3.70%	100.00%
Remained constant	23.10%	59.80%	5.10%	6.80%	5.10%	100.00%
Total Count	100	180	14	22	12	328
% within the group	30.50%	54.90%	4.30%	6.70%	3.70%	100.00%

6. Over 84% of the respondents agreed that technology adoption is a key component in the success of SME businesses.

Of the three aspects of growth considered, it was only workforce that had a significant association, table 7. The kinds of the technology adopted meant that there was

Table 7: Test of relationship between technology adoption and SMEs growth aspects

Aspect of SMEs growth	Chi-Square value	Degrees of freedom	p-value
Production/volume/output	13.22	8	0.105
Profit	12.916	8	0.115
workforce	38.685	8	0.000

need to increase the distribution channels as most of that additional workforce dealt with sales, marketing and distribution.

CONCLUSION

On use of technology, the study found that while the respondents were in agreement on the importance of technology, there was very low usage, implying low productivity and this could be attributed to lack of resources, awareness and training. Lack of awareness of benefits and cost challenges are perhaps the two most critical elements hindering the adoption of technology. It also implies that the government support programs to drive the use of ICT are not adequately felt at SME level.

Recommendation

An important area for development of the SMEs is the access to technology and partnerships. Although the government has established Investment Authority to encourage the foreign investors to invest in the country, there has been lack of targeted approach such as partnering multinational corporations with the more developed SMEs in Kenya. Lack of proper policies in this regard and inadequate information has held back the establishment of mutual beneficial partnerships between SMEs in Kenya and the multinational corporations. The Investment authorities should play a role in providing information to encourage the strategic fit between multinational corporations and SMEs. The study suggests that this flow of information should be undertaken through national websites, business associations and directories. The Investment Authority should also provide information on the potential suppliers, purchasers and strategic technological partners. For this type of partnership to succeed, the study recommends the fine tuning of the investment policies and enabling business environment. Whereas large SMEs are more likely to form partnerships with multinational corporations, the smaller SMEs may find supply chain opportunities through working in teams and in cooperation with the more established counterparts (Hamisi 2011). These partnerships are great opportunities for technological and business skills transfer.

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