

TIME REQUIRED TO BREAK-EVEN FOR SMALL AND MEDIUM ENTERPRISES: EVIDENCE FROM KENYA

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ABSTRACT

The past two decades have seen exponential growth in the number of small and medium enterprises in Sub-Saharan Africa; however, about two-thirds of such enterprises often fail to take off, resulting to negative economic impacts at the micro and macro-levels. However, documentation of the subject remains limited, especially in Kenya. This study involved 146 enterprises that had been operational for between 1 and 5 years. Inclusion criteria included availability of consistent financial records as well as willingness to share such information. The findings showed that the duration taken to break-even ranged between 3 and 40 months. The level of training in financial management was the most important covariate, explaining up to 12.1% of variation in the duration taken to break-even. Ever training in financial management accounted for 10.2%, marketing (9.7%); educational attainment (8.6%), capititation-funding level (7.5%) and firm size (6.8%). The study recommends the need for universal entrepreneurship training programs, integration of entrepreneurship training in national plans, a multisectoral approach to entrepreneurship training, linkages between the private sector, academia and development partners as well as support centres at the county level to facilitate the development of such enterprises.

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KEYWORDS: Small and Medium Enterprises, Break-Even Analysis, Break-Even Point, Urban Slums

INTRODUCTION

Starting a new business is a risky undertaking that requires proper preparation to address challenges such as competition, resource constraints, staffing, staff development and management, product development, sales management and most importantly, financial resource management (Deakins, Logan & Steele, 2001; Rogoff, Lee & Suh, 2004; Wanjohi, 2008). Although the success of business ventures can be measured using various indicators, the most important is the achievement of financial stability (Deakins et al., 2001). Break-even analysis is one of the key tools available for planning and managing a firm's financial performance, particularly during the initial years of operation. As noted by LeFever (1998), break-even analysis is a useful tool for planning the success of young business ventures as well as new products and services. It facilitates budgeting and long-range planning of cash inflows and outflows. Break-even analysis is logically appealing and readily applicable to business firms of all sizes. Once constructed, break-even charts provide the management with a convenient guide for judging operational performance, adjusting pricing levels or controlling cost components (Deakins et al., 2001; Rothberg, 2012).

The break-even point is achievable when the total costs of production or services equals the total revenue received from sales. It is a point where a business neither makes profits nor incurs losses (Ndaliman & Bala, 2007; Rothberg, 2012). For new business ventures or new products launched in the market, achieving the break-even point (BEP) is a great milestone towards success. The duration taken to achieve the BEP is an indication of the management's capacity to plan and manage the inflow and outflow of financial resources. It also reflects a firm's success in marketing its products or services, as well as supportiveness of the business environment (Rothberg, 2012).

Break-even analysis utilizes two types of cost inputs, viz. fixed and variable costs (Riggs, 1992). For instance, in a business producing furniture, the purchase of paintbrushes would be an example of a fixed cost. Whether a manufacturer paints three or twelve pieces of furniture with a brush, the expense cannot change. Variable costs change with production volume. For instance, a business venture producing furniture would not incur any cost on paint when it has not produced any furniture. Moreover, the amount of paint and time required for three and twelve pieces of furniture vary significantly. The more the pieces of furniture, the more the paint required. As noted by Riggs (1992), the amount of input and the time used to produce a commodity constitute variable costs.

The traditional linear break-even analysis anchors on a linear relationship between total revenue (TR) and total cost (TC). The difference between TC and fixed costs (FC) yields the value of variable costs (VC). The BEP is the intersection between TR and TC. The difference between TR and TC before achieving BEP represents losses, while the difference after achieving BEP, represents profits. The break-even volume changes when the margins increase or decrease and when the efficiency of operations rises or falls (LeFever, 1998). It changes in response to purchases of equipment, inputs and services as well as to sales of finished products. In developing countries, achievement of the BEP is a key indicator of economic contribution of small and medium enterprises (SMEs) (Wanjohi, 2008).

In Kenya, SMEs play an important role in national development by employing about 75% of the national workforce and contributing about 22% of the national Gross Domestic Products (GDP). As noted by Atieno (2009), the development of SMEs a key strategy for Kenya's industrialization, employment creation, income generation and poverty reduction. Consequently, the Government of Kenya (GoK) has formulated a number of policy documents to stimulate the growth of SMEs, including the Sessional Paper Number 2 on *Industrial Transformation to the Year 2020* and the Sessional Paper Number 2, on the *Development of Micro and Small Enterprises for Employment and Wealth Creation* (Atieno, 2001; Mbithi & Mainga, 2006; Atieno, 2009).

The government's policy initiative aims at encouraging Kenyans to establish SMEs by enhancing access to funding and creating an enabling environment for SMEs to thrive. Although the number of SMEs has increased significantly over the past two decades, about two-thirds of such SMEs often fail to take off, thereby, subsiding with billions of resources (Ndaliman & Bala, 2007; Sharma, Sneed & Ravichandran, 2007). The failure of SMEs has serious impacts on the economic status of entrepreneurs, the financial sector as well as the national economy. Firms taking more than ten months to break-even in their operations are likely to fail, leading to loss of capitulation funds and subsequent impoverishment of entrepreneurs. In an environment of resource scarcity, most SMEs may bow out of business before reaching the BEP (LeFever, 1998; Ndaliman & Bala, 2007).

The duration taken by SMEs to achieve the BEP is critical for Sub-Saharan African (SSA) economies; however, there is a dearth of relevant empirical literature to inform the planning, policy formulation and financing of SMEs, particularly in Kenya. Although many SMEs are emerging, poverty levels remain all time high in most parts of the country, which raises concern about the preparedness of entrepreneurs with relevant financial management skills, the capacity to plan and manage cash inflows and outflows to expedite financial stability (Wanjohi, 2008; Mbithi & Mainga, 2006; Atieno, 2009). The issues also raise concern on whether the business environment is supportive to the growth of SMEs or otherwise (Mbithi & Mainga, 2006).

The duration taken by SMEs to achieve the BEP has significant micro- and macro-economic implications; thus, necessitating empirical investigations. The main objective of this study was to determine factors influencing the duration taken by SMEs in Nairobi's slum settlements to achieve BEP. The focus on Nairobi's slums stems from the high population growth rate, resulting from rural-urban migration. SMEs remain the largest provider of employment opportunities for rural-urban migrants; thus, their financial

stability and growth becomes of paramount interest to management scholars. The information generated by the study is also useful to financial institutions providing credit to SMEs, particularly because the financial success of SMEs translates to their own success, while SME failure increases the incidence of bad debts and court cases, with far-reaching negative effects at the micro and macro-economic levels. The remainder of this paper comprises of four sections, including the literature review, data and methodology, results and discussions as well as conclusions.

LITERATURE REVIEW

Empirical literature suggests that BEP changes from time to time with every purchase, production or sale. As noted by LeFever (1998), BEP changes in response to adjustments in production volumes, variable costs as well as prices of finished products or services. The duration taken by firms operating in certain environments to break-even is a function of various internal and external factors (Cragg & King, 1998; Rogoff et al., 2004; Watson, 2006; Sharma et al., 2007; Rothberg, 2012). Internal factors include financial management capacity, amount of capital invested and marketing initiatives, while external factors include demand and supply forces as well as purchasing power of the targeted market (Rothberg, 2012).

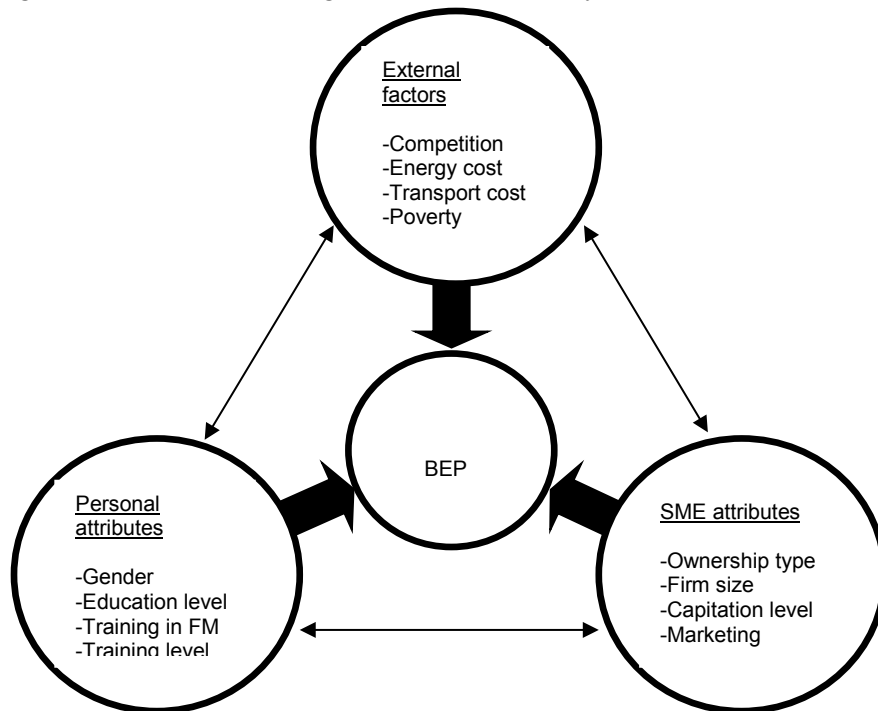
Rogoff et al. (2004) also note that the duration taken by firms to break-even correlates with the individual attributes of entrepreneurs, firm-specific aspects and external factors. Furthermore, Watson (2006) point out that management literature has focused on whether large firms take a shorter duration to achieve financial stability than small firms do and vice versa. On the same note, Cooper and Dunkelberg (2006) note that small firms may have limited access to human, financial and organizational resources, which in turn, is likely to retard their performance and delay the attainment of BEP. Sharma and Upneja (2005) found that marketing resources, the amount of capital invested, as well as manager's education level, training in financial management, previous experience are the most important factors influencing the duration taken to achieve financial stability among new business ventures. Earlier, Cragg and King (1998) noted that the duration taken by young business firms to achieve financial stability strongly relates to market forces as well as entrepreneur's objectives, characteristics and management practices.

Islam and Ali (2008) found that the duration taken to achieve financial stability was a function of factors such as business practices, financial management skills, experience and external environmental factors such as macro-economic policies and procedures, access to financing, infrastructure and quality of infrastructural services, which may directly or indirectly influence the performance of small businesses. As noted by Sharma et al. (2007), the external environment, in most cases, is beyond the control of firms and can be either hostile or in favor of new market entrants. However, it is important for business managers to formulate strategies to adapt to prevailing business environmental conditions.

Similarly, Indarti and Langenberg (2005) categorized factors influencing the financial performance of SMEs to include characteristics of the entrepreneurs, characteristics of the SMEs; and contextual elements of SME development. Other factors influencing the duration taken to achieve financial stability include products and services (Hitt & Ireland, 2000), level of capitation funding and availability of supplementary resources to sustain operations before BEP is achieved (Swierczek & Ha, 2003) and marketing strategy (McMahon, 2001).

Based on the empirical studies, figure 1 categorizes factors influencing the duration taken by SMEs to achieve BEP into three groups, viz. personal attributes of business managers, SME attributes and external factors playing at the market. The three categories are interrelated and influence each other. For instance, the amount of capital available is likely to influence the decision of a firm to embark on staff training. Similarly, expenditure on utilities influences the amount of resources available for marketing or motivation of staff members.

Figure 1: Factors Influencing the Duration taken by SMEs to Break-Even



The figure shows the factors influencing the achievement of the break-even point (BEP), which fall into three groups, namely personal attributes such as training in financial management, SME attributes such as capitation level and external factors such as the cost of energy. Whereas BEP is the dependent variable, those listed under each groups are the independent variables. A unit change in the value of each independent variable causes a proportionate change in the dependent variable. Note that FM stands for financial management.

The conceptual framework shows that BEP is the dependent variable, while independent variables include external factors, personal attributes of SME managers as well as SME-specific attributes. The next section provides details of the methods used in this study.

DATA AND METHODOLOGY

The study targeted small and medium enterprises (SMEs) that had been operational for between 1 and 5 years. Inclusion in the sample depended on the availability of consistent financial records detailing monthly sales and expenditures, as well as willingness to share such information and to participate in the interview. Out of 266 SMEs contacted, 146 (54.9%) met inclusion criteria and their managers participated in interviews in early 2012. Data collection included identification of SMEs meeting the inclusion criteria, consenting, interviews and extraction of information from financial records. We applied a cross-sectional survey design, with quantitative and qualitative approaches to guide the research process. Detailed description of the design and approaches used in this study are available in following publications (Nachmias & Nachmias, 1996; Bryman & Cramer 1997; American Statistical Association, 1999; Owens, 2002; Rindfleisch, Malter, Ganesan & Moorman, 2008).

Quantitative analysis generated cross-tabulations with Chi-square (χ^2) tests, correlation co-efficients, scattergram with F-statistic and *odds ratios - Exp (β)*. Binary logistic regression predicts the proportion of variation in a dichotomous variable from a set of independent variables (Aldrich & Nelson, 1984). In this study, the dependent variable was the duration taken to attain the break-even point (BEP), with only two possible values – *below 1 year or above 1 year*. The model takes the following form:

$$\text{Logit}[\theta(Y) = \log \left[\frac{\theta(Y)}{1-\theta(Y)} \right] = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 \dots + \beta_i X_i + \varepsilon \quad (1)$$

Where: Y = the predicted variable (*duration taken to attain BEP*); $\theta(Y)$ = the probability of an SME breaking-even within one year; $1 - \theta(Y)$ = the probability of an SME breaking-even after one year; α = the constant term of the equation; $\beta_1, \beta_2, \dots, \beta_i$ = regression co-efficients associated with independent variables; X_1, X_2, \dots, X_i = independent variables and ε = the error term. In addition, we processed and analyzed qualitative data using thematic analysis, which involved transcription of responses, creating thematic nodes and systematic interpretation.

RESULTS AND DISCUSSIONS

Of the 146 small and medium enterprises (SMEs), 19% dealt in woodwork products, 21% traded in metalwork products, 13% sold clothing products, while another 12% specialized in bakery products. Other business forms involved in the study included beadwork (10%), automobile (9%), chemists (6%), drycleaners (6%) and supermarkets (4%). Up to 82.2% of SMEs dealing in wooden products operated as retailers. For metalwork traders, 58.4% served the market as both retailers and wholesalers, while 54.6% of SMEs dealing in clothing products operated as both retailers and wholesalers. In the case of bakery products, nearly two-thirds (58.1%) were involved in retailing, while 79.3% of SMEs specializing in beaded products also operated as retailers.

Table 1 shows the mean duration taken by business ventures in each category to break-even. The results show that supermarkets took the longest time (24.5 months) to achieve BEP, followed by drugstores (23.1 months), automobile services (22.1 months) and beadwork (17.5 months). Contrastingly, businesses specializing in bakery products recorded the shortest mean duration (13.1 months) to break even, with the fastest firms taking 3 months. Next in line from the top were SMEs specializing in metalwork products (13.7 months) and woodwork products (14.8 months).

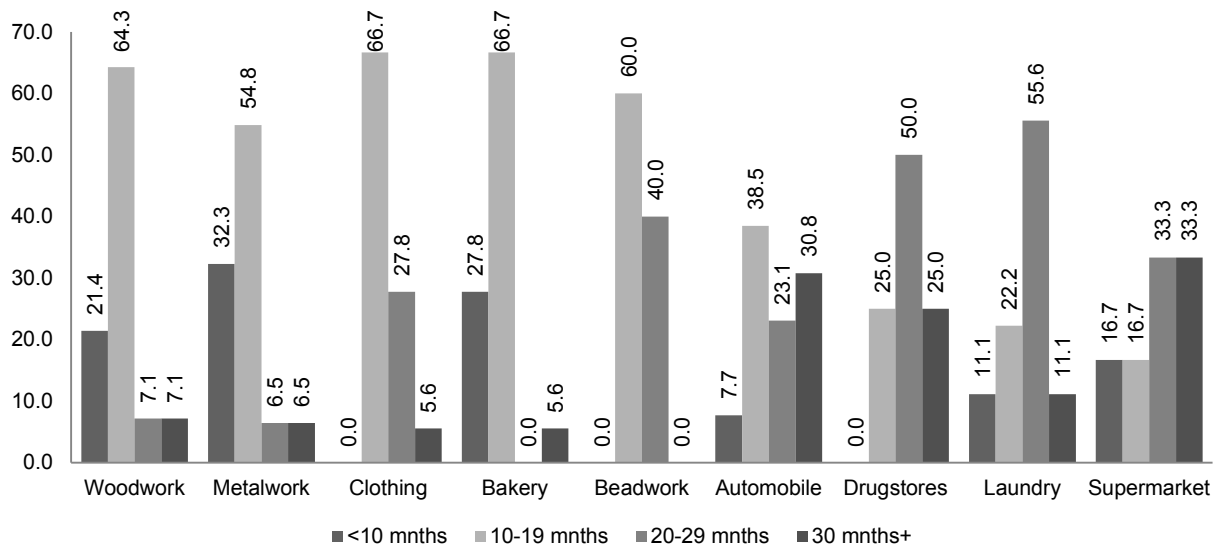
Table 1: Mean Duration Taken to Achieve the Break-Even Point (Months)

| Sub-sector | N | Mean | Std. Deviation | Minimum | Maximum |
|--------------|-----|--------|----------------|---------|---------|
| Woodwork | 28 | 14.791 | 7.347 | 3 | 34 |
| Metalwork | 31 | 13.735 | 7.565 | 4 | 39 |
| Clothing | 18 | 16.721 | 7.002 | 10 | 36 |
| Bakery | 18 | 13.110 | 6.761 | 3 | 33 |
| Beadwork | 15 | 17.472 | 6.404 | 11 | 27 |
| Automobile | 13 | 22.077 | 9.087 | 8 | 35 |
| Drugstores | 8 | 23.123 | 7.553 | 11 | 33 |
| Drycleaners | 9 | 20.891 | 9.060 | 4 | 34 |
| Supermarkets | 6 | 24.501 | 10.905 | 9 | 40 |
| Overall | 146 | 16.748 | 8.236 | 3 | 40 |

This Table shows the mean duration taken by firms in various sub-sectors to achieve the break-even point. The first column shows the sub-sectors captured by the study, the second column shows the number of firms in each sub-sector, the third column is the standard deviation from the mean in each group, while the fourth and fifth columns show the minimum and maximum duration (in months) taken by firms in each sub-sector to break-even.

Firms dealing in wooden and bakery products reported the shortest time taken to achieve BEP, supermarkets showed the longest duration. Overall, SMEs included in the study took an average of 16.8 months to break-even. Figure 2 shows that up to 21.4% of the SMEs in the woodwork achieved the break-even level within the first 10 months of their operations.

Figure 2: Sectoral Variation in the Duration Taken Break-Even



This Figure shows the average duration taken by small and medium enterprises in each sub-sector to achieve the break-even point. The duration has been grouped into four categories, including 'less than 10 months', which is represented by the first bar from left; '10 to 19 months', represented by the second bar; '20 to 29 months' represented by the third bar and '30 months or higher'. Within the text, I designate the categories as first, second, third and fourth terms, respectively. Besides, I refer to firms attaining the BEP within the first 10 months as 'early bloomers' and those doing so at 30 months or higher as 'late bloomers'.

Among SMEs dealing in metalwork products, about one-third (32.3%) attained the break-even point within 10 months. The proportion of firms achieving BEP within the first term was high among traders in the metalwork, woodwork and bakery sub-sectors, while the proportion of late bloomers was high among drycleaners, drugstores, beadwork dealers and supermarkets. The analysis obtained a computed χ^2 value of 56.381, with 24 degrees of freedom and a p -value of 0.000. The result is significant at 1 percent, suggesting up to 99% chance that the duration taken to achieve BEP was significantly different across the various sectors.

The duration taken by SMEs to break-even is a function of various factors both within and outside business firms. Internal factors include the background profile of SME managers and attributes specific to SMEs. Besides, external factors arise from the environment in which a firm operates and may include market demand and supply forces, competition, cartels and distribution channels as well as government policy. This study captured variables such as gender of SME managers, education level, professional training in financial management, ownership form, amount of capital invested, firm size in terms of number of paid workers and business age.

The SME managers included 96 (65.8%) men and 50 (34.2%) women. Table 2 indicates that among SMEs run by men, up to 19.8% achieved the BEP within the first 10 months of operation. This is slightly higher than the proportion of women-run SMEs that achieved the BEP within the same period. The results in Table 2 further show that men were likely break-even faster than women were. Consequently, the analysis obtained a computed χ^2 value of 8.562, with 3 degrees of freedom and a p -value of 0.036, which is significant at 5 percent. This suggests up to 95% chance that gender significantly associated with the duration taken to achieve that BEP among SMEs. In other words, SMEs run by men were more likely to achieve financial stability faster than those managed by women were. Hence, interventions designed to enhance SME survival should consider the needs of women-run SMEs.

Table 2 further indicates that the proportion of firms breaking-even within the first term was highest among those whose managers had university education (100.0%), followed by those having college education (50.0%) and secondary education (32.3%). Contrastingly, the proportion of those delaying to achieve BEP was highest among SMEs whose managers had no education (45.5%), followed by those whose managers had primary education (34.5%). The analysis showed that educational attainment by SME managers and duration taken to achieve BEP significantly associated (computed χ^2 value = 35.843, degrees of freedom = 12 and ρ -value = 0.000).

Table 2: SME Managers' Background Profile and the Break-Even Point

| Background attributes | <10 mnths | | 10-19 mnths | | 20-29 mnths | | 30 mnths+ | | Total | |
|--------------------------------------|-----------|--------|-------------|--------|-------------|--------|-----------|--------|-------|--------|
| | Freq | Pct | Freq | Pct | Freq | Pct | Freq | Pct | Freq | Pct |
| Gender | | | | | | | | | | |
| Male | 19 | 19.792 | 55 | 57.292 | 13 | 13.542 | 9 | 9.375 | 96 | 100.00 |
| Female | 5 | 10.000 | 23 | 46.000 | 16 | 32.000 | 6 | 12.000 | 50 | 100.00 |
| Highest education level | | | | | | | | | | |
| No education | 2 | 9.091 | 10 | 45.455 | 6 | 27.273 | 4 | 18.182 | 22 | 100.00 |
| Primary | 5 | 6.173 | 48 | 59.259 | 18 | 22.222 | 10 | 12.346 | 81 | 100.00 |
| Secondary | 10 | 32.258 | 15 | 48.387 | 5 | 16.129 | 1 | 3.226 | 31 | 100.00 |
| College | 5 | 50.000 | 5 | 50.000 | 0 | 0.0000 | 0 | 0.0000 | 10 | 100.00 |
| University | 2 | 100.00 | 0 | 0.0000 | 0 | 0.0000 | 0 | 0.0000 | 2 | 100.00 |
| Financial management training | | | | | | | | | | |
| Yes | 24 | 47.059 | 24 | 47.059 | 1 | 1.961 | 2 | 3.922 | 51 | 100.00 |
| No | 0 | 0.0000 | 54 | 56.842 | 28 | 29.474 | 13 | 13.684 | 95 | 100.00 |
| Training level | | | | | | | | | | |
| Certificate | 2 | 11.111 | 13 | 77.778 | 1 | 5.556 | 1 | 5.556 | 17 | 100.00 |
| Diploma | 18 | 62.069 | 10 | 34.483 | 0 | 0.0000 | 1 | 3.448 | 29 | 100.00 |
| Higher diploma | 4 | 80.000 | 1 | 20.000 | 0 | 0.0000 | 0 | 0.0000 | 5 | 100.00 |
| Ownership structure | | | | | | | | | | |
| Proprietorship | 8 | 9.877 | 45 | 55.556 | 20 | 24.691 | 8 | 9.877 | 81 | 100.00 |
| Partnership | 6 | 12.500 | 26 | 54.167 | 9 | 18.750 | 7 | 14.583 | 48 | 100.00 |
| Limited company | 10 | 58.824 | 7 | 41.176 | 0 | 0.0000 | 0 | 0.0000 | 17 | 100.00 |

This Table shows the cross tabulation results between SME managers' background profile and the duration taken to break-even. Among other findings, the Table shows that a higher proportion of firms run by men than women achieved the BEP within the first 10 months of operation. The Table further shows that the proportion of firms breaking even in the first term was higher among those whose managers had trained in financial management than among those whose managers lacked such training; while the proportion of firms breaking-even within the first 10 months of operation was highest among limited companies and lowest among firms operating as sole proprietorships. Note that 'Freq' is the abbreviation of frequency distribution, while 'Pct' stands for percent.

Furthermore, Table 2 indicates that the proportion of firms breaking even within 10 months was higher among those who had acquired some training in financial management, while the proportion of late bloomers was higher among those who had not acquired training in such skills. Based on this, the analysis obtained a computed χ^2 value of 61.025, with 3 degrees of freedom and a ρ -value of 0.000, which is significant at 1 percent. This suggests up to 99% chance that having some training in financial management significantly associated with to the duration taken by SMEs to break-even in their operations.

Regarding the training level, of the 51 SME managers who had trained in financial management, 29 (19.9%) had trained up to the diploma level; 18 (12.3%) had attained certificates, while 5 (3.4%) reported having higher diplomas in financial management. The results in Table 2 show that the proportion of SMEs attaining BEP was highest among firms whose managers had higher diploma, but lowest among those whose managers had certificate qualifications. The analysis indicated that training in financial management and the duration taken by SMEs to attain BEP significantly related (computed χ^2 value = 15.089, degrees of freedom = 6 and ρ -value = 0.020).

More still, out of 146 SMEs, 81 (55.5%) were registered as sole proprietorship businesses, 48 (32.9%) were registered as partnerships, while 17 (11.6%) operated as limited companies. The results in Table 2 indicate that the proportion of firms attaining BEP within the first 10 months of operation was highest

among limited companies and lowest among SMEs operating as sole proprietorships. Contrastingly, the proportion of firms delaying to break-even was highest among sole proprietorships than among limited companies.

Bivariate analysis yielded a computed χ^2 value of 28.689, with 6 degrees of freedom and a ρ -value of 0.000. This suggests up to 99% chance that the association between ownership form and the duration taken to attain BEP was significant. Apparently, limited companies were likely to be most efficient in financial planning and management, followed by partnerships and sole proprietorships. I measured firm size in terms of the number of paid workers. The study found that 82 (56.2%) firms had between 4 and 7 paid workers, 48 (32.9%) had between 1 and 3 workers, 11 (7.5%) reported having between 8 and 11 paid workers, while 5 (3.4%) had at least 12 such workers.

The level of capitation funding determines an SME’s ability to venture into the market with quality and competitive products or services. I plotted the two variables (firm size and level of capitation funding) on a scattergram to determine significance of the correlation between the two variables and the duration taken to break-even. The analysis obtained three curves, namely, linear, logarithmic and exponential, whose model summary and parameter estimates I have presented in Table 3. The results indicated that SMEs having a lower number of paid workers were likely to take longer duration to break-even, while those having relatively higher numbers of paid workers were likely to take a shorter duration to achieve the BEP. Thus, the number of paid workers and the duration taken to break-even correlated inversely.

Table 3: Model Summary and Parameter Estimates

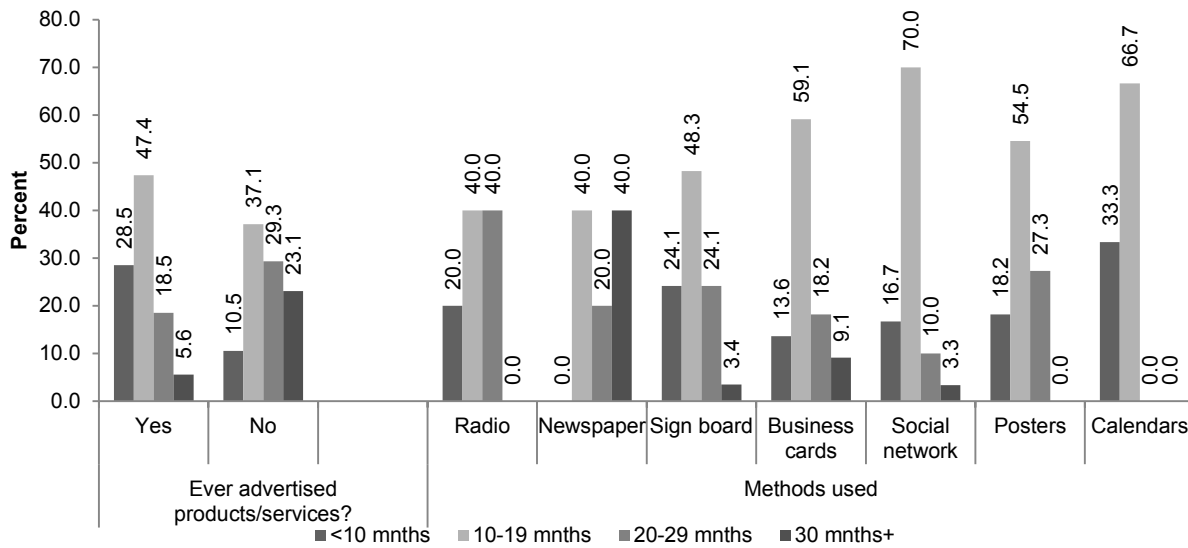
| Equation type | Model Summary | | | | Parameter Estimates | | | |
|--------------------|---------------|--------|--------|-----|---------------------|----------|--------|---------|
| | R Square | F | df1 | df2 | Sig. | Constant | b1 | |
| Firm size | Linear | 0.6137 | 229.04 | 1 | 144 | 0.000*** | 8.769 | -0.2285 |
| | Logarithmic | 0.6783 | 302.88 | 1 | 144 | 0.000*** | 15.193 | -3.812 |
| | Exponential | 0.7069 | 347.46 | 1 | 144 | 0.000*** | 10.598 | -0.0527 |
| Capitation funding | Linear | 0.3345 | 72.385 | 1 | 144 | 0.000*** | 24.550 | -5.548 |
| | Logarithmic | 0.4386 | 112.79 | 1 | 144 | 0.000*** | 180.17 | -1.006 |
| | Exponential | 0.4723 | 128.98 | 1 | 144 | 0.000*** | 26.014 | -0.0401 |

*This Table presents summary of the models generated though scattergram analysis, including linear, logarithmic and exponential. The column labeled R Squared is the coefficient of determination, which shows the explanatory power of each equation. The computed F-statistic values were significant, implying that correlation between each variable (firm size and capitation level) and duration taken to break-even was significant. Note that *, **, and *** indicates significance at 10, 5 and 1 percent respectively.*

The results indicated that SMEs investing low amount of capital were likely to take longer time to break-even. Contrastingly, at higher levels of capital investments, the time taken by SMEs to break-even was relatively shorter. Table 3 further indicates that the computed F-statistic values for the three curves are significant at 1 percent, suggesting up to 99% chance that the number of paid workers significantly correlated with the duration taken by SMEs to reach BEP. Out of 146 firms, 108 (74.0%) had taken some initiative to advertise their products and services.

Furthermore, figure 6 shows that up to 28.5% of the SMEs that advertised their merchandise reached BEP within the first 9 months of their operations, as compared to 10.5% of those who did not advertise the same. Based on this finding, the analysis obtained a computed χ^2 value = 11.694, degrees of freedom = 3 and ρ -value = 0.009, which was significant at 1 percent. This suggests up to 99% chance that advertisement of merchandise significantly associated with the duration taken to break-even.

Figure 3: Advertisement and Break-Even Duration



This Figure indicates the proportion of firms that had advertised their merchandise and those that had not vis-à-vis the duration taken to break-even. Besides, the figure presents the methods used by firms to advertise their merchandise in relation to the duration taken to achieve BEP. Notably, firms that advertised their merchandise achieved financial stability faster than those that did not advertise their products.

In addition, SMEs used various methods to advertise their merchandise, including signboards (26.9%), social networks (27.8%), business cards (15.1%), calendars (10.2%), posters (5.6%), radio (4.6%) and newspapers (4.6%). The results presented in figure 6 above indicate that the proportion of early bloomers was highest among SMEs that used calendars to advertise their merchandise, followed by signboards and radio. The study found that advertisement methods and the duration taken to break-even had no significant relationship (computed χ^2 value = 21.754, degrees of freedom = 18 and p -value = 0.243). As regards external factors, table 4 shows that 94 (64.4%) SME managers identified competition as the main factor influencing the duration taken to break-even.

Table 4: Factors Influencing the Duration Taken by SMEs to Break-Even

| Valid responses | Frequency | Percent of Responses | Percent of Cases |
|--------------------------|-----------|----------------------|------------------|
| Competition | 94 | 30.032 | 64.384 |
| Cartels | 8 | 2.556 | 5.479 |
| High cost of electricity | 72 | 23.003 | 49.315 |
| High transportation cost | 37 | 11.821 | 25.342 |
| High poverty levels | 78 | 24.920 | 53.425 |
| Heavy taxation | 24 | 7.668 | 16.438 |
| Total | 313 | 100.00 | 214.38 |

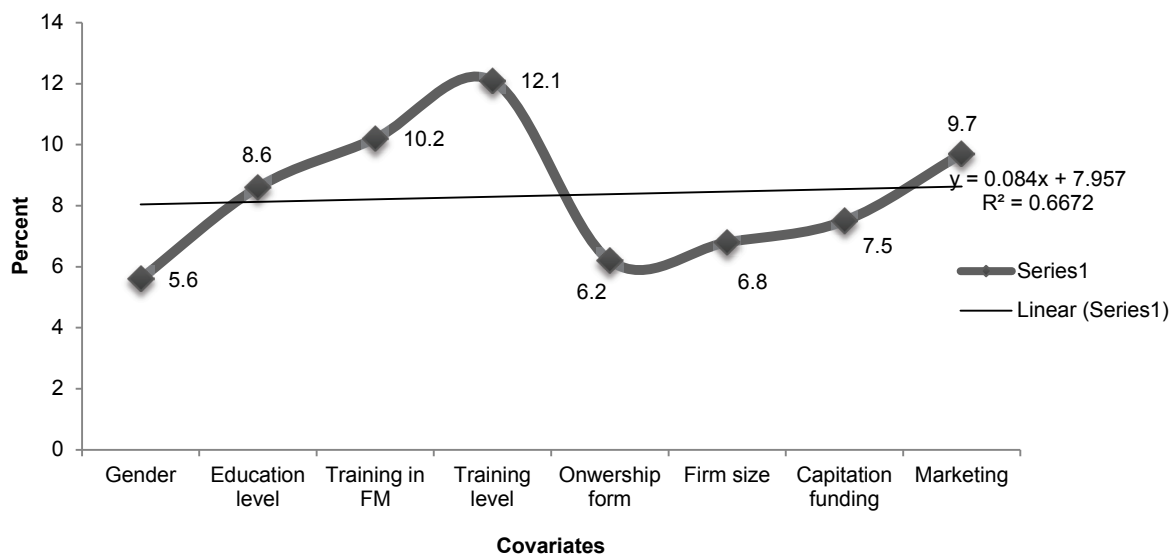
This Table presents findings on the external factors influencing the duration taken by SMEs to break-even in their operations. I have presented the findings as multiple responses, with four columns, including 'valid responses', 'frequency', 'percent of responses' and 'percent of cases'. The most critical factors include competition, high poverty levels and high cost of electricity.

More still, 78 (53.4%) respondents identified high poverty levels as one of the factors undermining the purchasing power of the target market. The main economic activities in the Nairobi slum settlements include casual labour, small businesses such as vegetable vending, roadside cafes and grocery shops; illicit brewing and drugs; as well as formal employment. Other factors included high cost of electricity (49.3%), high transportation cost (25.3%) and heavy taxation (16.4%).

Cross tabulation with Chi-square tests and curve estimation show that the duration taken by SMEs to break-even in their operations significantly associated with various background factors, including *managers' gender, highest education level, ever training in financial management, level of training in financial management*. Break-even duration also significantly related with firm attributes such as *ownership structure, firm size, level of capitation funding and ever marketing of products/services*. However, bivariate analysis techniques are not capable of determining the effect of a set of independent variables on a dependent variable, which necessitated the application of multivariate analysis techniques.

Binary logistic regression is a multivariate analysis technique often used to predict variation in a dependent variable from a set of independent variables. We applied the technique to determine factors influencing the duration taken by SMEs to attain the break-even point. To achieve this, a regression model was generated using binary logistic regression. The model incorporated the independent variables (covariates listed in the preceding paragraph). The magnitude of change in the value of in -2 Log Likelihood (-2LL) statistic each time a covariate is added into the equation determines the importance of a covariate in the equation. In this study, the odds ratios associated with each covariate was converted into percentages and plotted on a scattergram as indicated in Figure 4.

Figure 4: Effect of Covariates on the Duration Taken to Break-Even



This Figure shows the distribution of covariates on a scatter-gram, which was also used to generate best-fit line and co-efficient of determination R^2 , representing the predictive power of the model. The linear equation for the model is $y=0.049x + 4.181$, with $R^2=0.6672$. Overall, the model explains up to 66.7% of variance in the duration taken by small and medium enterprises to break even in their operations.

The results in figure 4 show that the training level accounted for up to 12.1% of variation in the duration taken by SMEs to attain the BEP. In other words, supporting SME managers to attain the highest level of training in financial management is likely to reduce the time taken to break-even by up to 12.1%. Training in financial management explained up to 10.2% of variation in the duration taken to achieve BEP. Next in order are marketing initiative (9.7%), education level (8.6%), the level of capitation funding (7.5%), firm size (6.8%), ownership form (6.2%) and gender of SME managers (5.6%). Overall, the model explains 66.7% of variance in the duration taken by SMEs to attain BEP.

CONCLUSIONS

The purpose of this study was to determine factors influencing the duration taken by SMEs to break-even in their operations. There is no doubt that SMEs play a significant role in both developed and economy of developing economies. Although the Government of Kenya (GoK) has formulated various policy frameworks to spur the growth of SMEs, there seems to be a gap when it comes to concrete plans to improve the management capacity of entrepreneurs, which in turn, undermines the survival of SMEs. As a result, about two-thirds of SMEs often fail to realize their potential and purposes for which they are established. SME failure negatively affects the economy at the household and national levels.

The study found that the duration taken by SMEs to break-even varies significantly from one sector to the other. While some firms reached the BEP within a few months of operation, the study showed that others took as long as 40 months before breaking-even. Furthermore, training in financial management was the most important covariate explaining up to 12.1% of variation in the duration taken by SMEs to attain the BEP. This is followed by ever training in financial management, which accounted for 10.2% of variation in the duration taken to break-even, ever marketing (9.7%), educational attainment (8.6%), the level of capitation funding (7.5%), firm size (6.8%), ownership form (6.2%) and gender of SME managers (5.6%). However, the central theme of factors influencing the duration taken by SMEs to achieve BEP is poor planning and management of financial resources vis-à-vis the external environment.

With appropriate skills in financial management, SME managers are likely to reduce up to 10.2% of delays in breaking even. Better still, with training of up to higher diploma level, SME managers are likely to reduce up to 12.1% of delays in achieving financial stability. This implies that enhancing access to credit facilities, easing taxation and providing infrastructural facilities alone is incomplete if such measures are not accompanied with training programs to enable potential entrepreneurs acquire and develop skills in financial management. In view of this, SSA governments should consider investing in entrepreneurial training programs to support the growth of SMEs. Already countries such as Rwanda and Mozambique have made efforts to target entrepreneurship education to women and rural populations, as part of their poverty reduction strategy. The experiences of these two countries can provide useful lessons to inform entrepreneurship education in other SSA countries.

Training in financial management and the level of such training are the most crucial covariates explaining the duration taken by SMEs to achieve the BEP in their operations. The Government of Kenya continues to support the development of SMEs by improving access to funding through programs such as the Youth and Women's Enterprise Funds. The government also strives to create an enabling business environment by easing-off taxation and providing necessary infrastructural facilities. However, there is limited evidence of strong and well-funded training programs targeting potential entrepreneurs in all parts of the country. Consequently, measures such as enhancing access to funding and creating an enabling environment are less likely to reduce the proportion of SMEs sinking with capitation funding. Financial management skills are particularly important in resource-poor countries, particularly in SSA. Initiating appropriate training programs for entrepreneurs is likely to shorten the duration taken to achieve the BEP by SMEs, which in turn, is likely to synergize the positive role of SMEs in economic development, rather than perpetuate poverty.

Furthermore, efforts to support the growth of SMEs should have a long-term scope of investment, particularly through training programs, designed to help prospective entrepreneurs identify their abilities, analyze the environmental setup of small-scale business and industry, fulfill entrepreneurial ambition and acquire skills. Entrepreneurship education should not only help people incubate business ideas but also how to steer business ventures to great heights of financial stability. Entrepreneurship education should form part of the education system. The idea is to embed entrepreneurial culture in the education and training systems to prepare people for effective management of SMEs. Besides, national development

strategies and plans should incorporate entrepreneurship education. Entrepreneurship education should not be a continuous process that is accessible to all entrepreneurs.

An effective entrepreneurship education should involve all stakeholders in the private sector, education institutions and development partners. This necessitates linkages to facilitate the flow of skills, information and resources to support curriculum development and actual training activities at all levels. Such linkages are also necessary to open up opportunities for trainees to access opportunities to practices and develop their skills.

The inclusion of SMEs in this study depended on the availability of consistent financial records detailing monthly sales and expenditures, as well as willingness to share such information and to participate in the interview. However, the study found that nearly one-half of the sampled firms did not have complete and up-to-date financial records, which constrained their inclusion. Consequently, out of 266 firms that were contacted, only 146 (54.2%) met the inclusion criteria. Due to this challenge, I failed to attain the target sample size, which may have implications on the precision and validity of results.

Furthermore, this study focused on three broad conceptual groups of factors influencing the duration taken by SMEs in Nairobi to break-even in their operations. Arguably, the duration taken to break-even is critical for SMEs operating in environments of resource constraints. The sooner a firm attains the BEP, the better the chances for survival. However, the study fails to provide information on the failure/survival rate of SMEs before and after breaking even, because even after attaining the BEP SMEs remain vulnerable to failure. In view of this, future studies should undertake survival analysis of SMEs before and after breaking even, as well as determine factors influencing the survival of such entities during the two periods.

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REFERENCES

Aldrich, S.T. and Nelson, P.D. (1984) *Advanced Quantitative Techniques for Social Sciences, 2nd Edition*. New York: Routledge.

American Statistical Association (1999) *Survey Research Methods Section Information*.

Atieno, R. (2001) *Formal and Informal Institutions' Lending Policies and Access to Credit by Small-Scale Enterprises in Kenya: An Empirical Assessment*. AERC Research Paper 111. Nairobi: African Economic Research Consortium.

Atieno, R. (2009) *Linkages, Access to Finance and the Performance of Small-Scale Enterprises in Kenya*. Research Paper No. 2009/06. New York: World Institute for Development Economics Research.

Bryman, A. and Cramer, D. (1997) *Quantitative Data Analysis with SPSS for Windows: a guide for Social Scientists*. London: Routledge

Cooper, A.C. and Dunkelberg, W.C. (2006) "Entrepreneurship and Paths to Business Ownership," *Strategic Management Journal*, Vol. 7 (1), p.53-68.

Cragg, P.B. and King, M. (1998) "Organizational characteristics and small firm's performance revisited," *Entrepreneurship Theory and Practice*, winter, p. 49-64.

Deakins, D., Logan, D. and Steele, N. (2001) *The Financial Management of the Small Enterprise*. London: Certified Accountants Education Trust.

Hitt, M. and D. Ireland (2000) "The intersection of entrepreneurship and strategic management research," in *Handbook of entrepreneurship*, D. Sexton & H. Landström (eds.), p. 45-63. Oxford: Blackwell.

Indarti, N. and Langenberg, M. (2005) *A Study of Factors Affecting Business Success among SMEs: Empirical Evidences from Indonesia*.

Islam, A. and Ali, S. (2008) A profile of SMEs in Malaysia: *SME Development in Malaysia: Domestic and Global Challenges*, February, p.4-13.

LeFever, S.C. (1998) *Using break-even analysis to manage costs and make pricing decisions*. Seattle, Washington: Business Resource Services Inc.

Mbithi, M. and Mainga, J. (2006) *Doing Business in Kenya Procedures and Regulations, Opportunities, Sources of Finance and Incentives: A Handbook for Local Investors*. Nairobi: UNDP.

McMahon, R.G.P. (2001) "Growth and performance of manufacturing SMEs: The influence of financial management characteristics," *International Small Business Journal*, Vol. 19 (3), p. 10-28.

Nachmias, C.F and Nachmias, D. (1996) *Research Methods in the Social Sciences, 5th Edition*. London: Arnold.

Ndaliman, M.B. and Bala, K.C. (2007) "Practical Limitations of Break-Even Theory" *Australian Journal of Technology*, Vol. 11 (1), p. 58-61.

Owens, K.L. (2002) *Introduction to Survey Research Design*. SRL Fall 2002 Seminar Series, Accessed on October 21, 2012 at <http://www.srl.uic.edu>

Riggs, A. (1992) "Planning and financial Performance of Small, Mature Firms". *Strategic Management Journal*, Vol. 7 (6), p. 503-522.

Rindfleisch, A., Malter, A.J., Ganesan, S. and Moorman, C. (2008) “Cross-Sectional Versus Longitudinal Survey Research.” *Journal of Marketing Research*, Vol. 45 (3), p. 1-23.

Rogoff, E.G., Lee, M.S. and Suh, D.C. (2004) “Attributions by entrepreneurs and experts of the factors that cause and impede small business success,” *Journal of Small Business Management*, Vol. 42 (4), p. 364-376.

Rothberg, A.F. (2012) *Using break-even analysis to determine your company's financial Health*. CFO Edge, LLC.

Sharma, A. and Upneja, A. (2005) “Factors influencing financial performance of small hotels in Tanzania,” *International Journal of Contemporary Hospitality Management*, Vol. 17 (6), p. 504-515.

Sharma, A., Sneed, J. and Ravichandran, S. (2007) “Spatial analysis of small hotel activity in Tanzania,” *International Journal of Contemporary Hospitality Management*, Vol. 19 (7), p. 589-599.

Swierczek, F.W. and Ha, T.T. (2003) “Entrepreneurial orientation, uncertainty avoidance and firm performance: an analysis of Thai and Vietnamese SMEs”. *International Journal of Entrepreneurship and Innovation*, Vol. 4 (1), p. 46-58.

Wanjohi, A. M. (2008) “Challenges facing SMEs in Kenya,” *Journal of Small Business Management*, Vol. 21 (3), p. 43-51.

Watson, J. (2007) “Modeling the relationship between networking and firm performance,” *Journal of Business Venturing*, Vol. 22, p. 852-874.