Firm's Characteristics and Productivity in Kenya

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Abstract

There has been different theoretical argument on the link of different firm's characteristics on productivity. According to various literature size of the firm, firm's ownership characteristics, skilled labour force and expenditure on research and development are some of the firm's characteristics that affect productivity. However different empirical studies conducted in both developing and developed countries have produced contradictory results. This study therefore examines how different firm's productivity has affected various firms' productivity in Kenya. To achieve this objective primary data was collected from various firms. Thereafter analysis was done using Feasible Generalized Least Square method (FGLS). According to the results foreign firms were more productive in most of the sectors in Kenya. Other factor that affected productivity included: research and development, gender diversity, skills and firms size. Ethnicity was found to have no impact on productivity.

Keywords: Firms characteristics, gender diversity, skills, Productivity

Introduction

There has been empirical and theoretical evidence that there is a link between various firms' characteristics and productivity. Most studies carried in developing and developed countries have proofed that the level of skilled workers, how much firms spend on research and development have a direct impact on increase on firm's productivity (Wang and Tsai, 2004). However the effects of various firm's characteristics on productivity have been controversial and different studies have produced mixed results. Rajeev, (1999) postulates that smaller firm's exhibit a higher profit rate even though they have lower survival probability and have difficulties in accessing the capital market. The author suggested that profit rates for larger firms are much lower than those of small firms. But on the other hand, large firms have higher market power and are able to obtain capital; therefore they are expected to maximize their returns. The size, proxies capital markets access, making small firms the most likely to face financing constraints in the sense that they pay a higher interest rate on borrowed loan and this makes them to get a smaller loan size than they desire hence this reduces their average returns. However, the higher productivity or efficiency of smaller firms is the result of their organizational structure that allows them to take strategic actions to exploit emerging movement opportunities and to create a niche market for themselves. Thus small firms utilizing their greater organizational responsiveness are better at adapting to environmental challenges than large firms. Hence bringing contradiction on how size affects firm's productivity. The diverse workforce may be a key factor in helping firms to understand and to meet the new needs. Osborne hypothesized that diversity can be beneficial to a firms' performance due to better decision making, improved problem solving, more creativity, innovation and more about global products and markets. Hence this enhances a firm's ability to compete in national and global markets. On the other hand, gender diversity may also be a cause of misunderstanding, suspicion and conflict in the work place which can result to absenteeism, poor quality of work, low morale and loss of competitiveness (Basset-Jones, 2005). In addition it's not also clear how ownership characteristic affects firm's productivity.

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Many studies done especially after the mid 1990's have revealed that the productive performance of domestic firms has been stagnating and most of the domestic firms are not able to meet their objectives unlike their foreign counter parts (Teal, 1999). In Kenya, a survey carried out on productivity analysis of both domestic and foreign firms by Ngugi and Musengele (2008), showed that out of the sampled firms, 75% of the foreign firms were able to meet their production goals compared to only 35% of domestic firms as shown in Table 1.1. Out of the sampled firms in food processing sector, 52% of the firms were domestic firms and in machines and engineering, 37% of sampled firms were local firms. The rest were foreign firms. The study found out that in some sectors like food processing and beverages, machines and engineering, the number of foreign firms almost equalled the domestic ones and performed better.

Table 1.1: Distribution of Sampled Firms by Ownership and their Productivities

Firm Type	Food and processing	Machines and engineering	Total sampled firms.	% of the firms meeting their Production objectives.
Local firms	55 (52%)	37(49%)	92	35%
Foreign firm	50(48%)	38(51%)	88	75%

Source: Ngugi and Musengele (2008).

It's believed that foreign firms have vast technical and managerial skills in addition to massive investment hence making them more productive than domestic firms. In addition, foreign firms may take over domestic firm's best employees by offering high wages (Koen and Bartoldus, 2002) and this reduces efficiency which eventually decreases the productivity of the domestic firms. However, domestic firms have an advantage of familiar environment in their country giving them a more competitive advantage. As such, determining how different characteristics' influence firm's productivity in Kenya is the aim of this study

2.0 Literature Review

2.1 The O- Ring Theory on Productivity

This is a theory that was proposed by Kremer (1993). The author proposed a model that dictates the productive efficiency of skill matching. Total product of the firm is maximized by employing skilled workers and pairing those with similar skills. The theory shows that highly skilled workers will be matched together in equilibrium, and that wages and output will rise steeply in skill. The model is consistent with large income differences between countries, the predominance of small firms in poor countries, and positive correlation between the wages of workers in different occupations. The imperfect observability of skill leads to imperfect matching and thus to spillovers. The O ring production function is represented as shown in equation 2.1.

$$E(Y) = K^\alpha \left[\prod_{i=1}^{n} q_i \right] nB \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad 2.1$$

where n is the number of tasks to be undertaken to complete a product, Y is the level of output , K is capital and q is the level of skill required to accomplish each of n tasks. B is a multiplier term that depends on the characteristics of the firm. The important implication of this production function is positive assortative matching. This can be observed through a hypothetical four person economy with low skilled workers (q_L) and two highly skilled workers (q_H). This equation dictates the productive efficiency of skill matching as shown in equation 2.2

$$q_H^2 + q_L^2 > 2q_H q_L \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots.2.2$$

The positive externalities generated by the interaction of highly skilled workers make it advantageous and affordable for a firm with highly skilled workers in most of its tasks to hire highly skilled workers for the remaining tasks. Such firms therefore offer to pay more in order to attract highly skilled workers. Hence displacement of low skilled workers from the firms with high capacity to pay becomes a natural consequence of the sorting process.

2.2 Selected Empirical Studies

Koen and Bartlodus (2002) did a study on labour productivity and used a cross section of firms rather than a panel analysis of the firms. The study used company data for 1084 Hungarian firms for the year 1997 to 1998. The main objective of the study was to find out whether foreign firms perform better than domestic firms, and if there were spillover effects of FDI within and between sectors. After controlling for selection bias and using Ordinary Least Squares (OLS), the study found that foreign firms are more productive than domestic firms from Hungary. The study also found that there were spillover effects between sectors. Backward linkages spillovers were found to be negative and forward linkages were positive. The spillover effects were dependent on absorption; it was more on local firms that had higher human capital. The study also found that spillovers were also dependent on openness of sectors while Positive sectoral effects were concentrated on open sectors. Hence, FDI and exports were found to be complements rather than substitutes as far as the effect of labor productivity was concerned. Negative backward spillovers dominated closed sectors, while forward spillover effects become strongly positive in very open sectors. However, the robustness of the findings can be doubted as the study did not take care of endogeneity problems hence results may be biased. Galindo-Rueda and Haskel (2005) did a study on association between workforce and firms level productivity in the U.K. firms. The study used a unique matched data set with information on the qualification attainment of firms' workforce and performance measures. The results of the study showed that firms with higher proportion of more educated, male and full time workers tended to be more productive and pay higher wages. The magnitude of this effects substantially varied by sector.

Atsuyula (2009) examined the relationship between productivity growth and characteristics of firms using Japanese firm- level data during the period 1995-2004. Applying bootstrapped Malmquist index approach and weighted least squares. The study found out that firm's age was positively related to total factor productivity. However the study concluded that higher dependency on part time workers decreased productivity. Farole and Winkles (2012) using a cross section of more than 25000 domestic manufacturing firms in 78 low and middle income countries from the World Banks enterprises surveys. The study assessed how absorption capacity and host country's institutional factors affected FDI spillovers. The study concluded that both of these factors influenced foreign direct investment spillovers.

3.0 Methodology

3.1 Theoretical Framework on Production Theory.

Production is the economic process of converting inputs into outputs. The inputs or resources used in production are called factors of production. Consider a firm that uses x inputs to produce a single output y.

$$Y = f(X) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \qquad 3.1$$

An efficient transformation of the inputs into output is characterized by production function f(x) which shows the maximum possible output obtainable with a given technology from a given set of inputs. Beginning with aggregate production function with Hicksian neutral shift in production at given levels of labour and capital.

$$Y = A_t F(K_t L_t) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \qquad 3.2$$

A_t measures the shift in production at given levels of labour and capital. To measure it, Solow (1957) used non parametric index approach (i.e. an approach that does not impose specific form on the production function). Total differentiation of equation 3.2 gives,

$$\frac{\dot{Y_t}}{Y} = \frac{\partial Y}{\partial K}\frac{K_t}{Y_t}\frac{\dot{K}}{K_t} + \frac{\partial Y}{\partial L}\frac{L_t}{\partial Y_t}\frac{\dot{L_t}}{L_t} + \frac{\dot{A_t}}{A} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \qquad 3.3$$

This equation shows that the growth of the real output of the firm on the left hand side can be factored into growth rates of capital and labour both weighted by their output elasticities and growth rate of the Hicksian efficiency index. The output elasticities in equation 3.3 are not directly observable but if each input is paid the value of its marginal product that is

$$\frac{\partial Y}{\partial K} = \frac{r_t}{p_t} \text{ and } \frac{\partial Y}{\partial L} = \frac{\omega_t}{p_t} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \qquad 3.4$$

Where, r_t is rent, ω_t is wages and p_t is price. Then relative prices can be substituted for the corresponding marginal product. This in turn converts the unobservable output elasticities to observable income shares α^K and α^L, then equation 3.6 becomes;

$$\Re_t = \frac{Y_t}{Y} - \alpha_t^K \frac{\dot{K}}{K_t} - \alpha_t^L \frac{\dot{L}}{L_t} = \frac{\dot{A}_t}{A_t} \dots\dots\dots\dots\dots\dots\dots\dots\dots \qquad 3.5$$

$\Re_t$ is the Solow residue and is the TFP.

Where, Y is firms total output at time t, (K_t) is capital at time t and L_t is labour at time t. α_L and α_K represented elasticity of capital and labour respectively. In the business cycle literature, λt random variable is added that takes account of temporary changes in the production function.

$$\Re_t = \frac{\dot{A}_t}{A_t} + \frac{\lambda_t}{\lambda} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots. \qquad 3.6$$

This random variable is usually ignored by economist as it occurs in short run and TFP is left with the variable that is of a permanent nature which is technological progress (Solow, 1957).

3.2 Empirical Model on Productivity

Following the theoretical argument, to achieve objective of study, TFP obtained from equation 3.2 was regressed against foreign ownership and other factors that determine productivity. According to Greene (2006) a multiple linear regression should be used to study the relationship between a dependent variable and more independent variables. Therefore combining all these variables:

$$TFP_{it} = \alpha + \beta_1 FO_{it} + \beta_2 GED_{it} INDEX + \beta_3 SKL + \beta_4 R\&D_{it} +$$
$$\beta_5 SZ_{it} + \beta_6 S_1 D_{it} + \beta_7 S_2 D_{it} + \mu_i + \varepsilon_{it} \dots\dots\dots\dots\dots\dots\dots\dots\dots.3.7$$

Where, FO is foreign ownership which was a dummy variable, it took the value of one if the firm had more than 10% ownership by foreigners and zero if otherwise. (UNCTAD, 2005). GED INDEX was an index used to calculate gender diversity in a firm, SKL was skills of employees. R&D was research and development, SZ was size of the firm, S_1D and S_2D are sectoral dummies. These dummies captured sectors heterogeneity. μ_i, is the firm specific error term, which is constant through time and captures unobserved firm heterogeneity effects. ε_{it} is the error term, i, is firm and t is time.

The index used was represented as;

$$ELF = 1 - \sum_{k=1}^{K} P_K{}^2 \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots.3.8$$

Where P_k is proportion of employees who belong to different categories in each firm, k is the number of categories.

3.5 Definitions and Measurement of the Variables

Total Factor Productivity (TFP) referred to an increase in output of the firm caused by other factors other than traditional inputs. It was measured as Solow residue of production function.

Capital (K) was the value of fixed assets of each firm, which was used as a proxy for the stock of capital.

Labour referred to the physical work done for wages and was measured by the total cost for labour.

Foreign Ownership (FO): This was captured using a dummy variable (D_i) that took the value of one if the company had more than 10% shares owned by foreigners and took a value zero if the company was owned by Kenyans.

Size of the firm (SZ): This was measured by total number of employees in the firm.

Gender Diversity (GED INDEX) was the proportion of female to male working in a firm. It was measured by calculating gender diversity of each firm using ELF index.

Skills (SKL) was a segment of the workforce with a high skill level that created a significant economic value through the work performed. It was proxied by total number of workers who had some special skills and has gone through college level, university or technical training.

Research & Development (R&D) was the total amount of money in Ksh. used by each firm on research and development.

4.0 Study Findings

4.1 Descriptive Statistics of Domestic and Foreign Firms

The study compared the summary of the various variables between domestic and foreign firms from the total sampled firms in the period comprising the year 2011 and 2014. The Wilcoxon signed rank test was used to find out if the differences between the means of domestic and foreign firms were significant. The results are presented in Table 4.1

Table 4.1: Summary of the Variables

Variable	Domestic firms		Foreign firms		Wilcoxon Signed-Rank Test.
	Mean	Std dev	Mean	Std dev	Prob > |Z|
Total Factor productivity	0.84	0.901	1.12	0.891	0.0000
Skilled	264.8842	329.7075	284.23	150.23	0.0021
Gender	0.3184779	0.1587345	0.362	0.141	0.1100
Research & Development	10.32516	18.81642	40.01	20.05	0.0002

Source: Constructed from the survey Data

Total factor productivity was the Solow residue of Cobb Douglas function estimated as in equation 3.6. TFP for the different sectors was calculated. Wilcoxon signed-rank test was used to test if there was significant difference between the means of domestic firms and foreign firms. The null hypothesis was that, the difference between the mean was zero. This test was used because it is not restricted unlike F and t tests. The data in Table 4.2 shows that the mean of total factor productivity of the domestic firms was 0.84, with a standard deviation of 0.901, while that of foreign firms was 1.12 with standard deviation of 0.891. Using Wilcoxon signed rank tests; the study rejected the null hypothesis and concluded that there was a significant difference between the means. Therefore on the basis of this test the study concluded that the average productivity of foreign firms was higher than that of domestic firms. Nguyen (2008) also found that foreign firms were more productive than domestic firms in Vietnam. This was probably contributed by the fact that foreign firms are known to invest heavily and are more efficient in order to enhance competition and overcome the disadvantage arising from operating in a foreign country (Kindlerberger, 1969). This also explained the reason why variation of TFP in foreign firms was lower than that of domestic firms i.e. they had a lower standard deviation than domestic firms. Skill was another variable that was measured by the number of skilled workers in each firm. In this study, skilled labour represented the number of employees who had gone through college level and had specialized training. The mean of skilled employees of domestic firms was 265 with a standard deviation of 330. For the foreign firms, the mean of skilled labour was 284 and standard deviation of 101. From Wilcoxon tests, the null hypothesis of the difference between the means was rejected. This meant that foreign firms had a higher mean level of skilled workers than domestic firms. Therefore, this can also explain the reason why foreign firms were more productive in comparison to their domestic counterparts.

In addition, the variation of skilled workers in different foreign firms was not higher than that of domestic firms. On the contrary, Konings (2001) found that there is no significant difference between the level of skills in both foreign and domestic firms in Venezuela manufacturing sector. Gender diversity was another variable which was measured by ethno linguistic fractionalization index. The mean of this diversity index for domestic firms was 0.312 with a standard deviation of 0.159 and the mean for foreign firms was 0.362 with a standard deviation of 0.141. From Wilcoxon test there was no difference between the mean of gender diversity in domestic and foreign firms. This meant that, foreign and domestic firms were almost equal in gender balance. Hamiliton, Nickerson and Owan (2004) had a different observation on garments' factories in Korea. The study found that foreign firms had more women employees than domestic firms. Finally, domestic firms had a mean of Ksh 10.3 million invested for research and development with a standard deviation of Ksh18.8 millions. Foreign firms comparatively, had a mean of Ksh 40.0 million and a standard deviation of Ksh20.1 millions. When tested using Wilcoxon tests, the study rejected the null hypothesis meaning that there was a significant difference between the means. The study therefore, concluded that the money invested in research and development in foreign firms was more than that of domestic firms. This can also explain why domestic firms were less productive in comparison to the foreign firms. This conforms to similar results by Pham (2008) using data of Enterprise survey of firms in Vietnam. The author found out that foreign firms used more money in research and development than domestic firms.

4.2 Summary of Comparative Performance of Domestic and Foreign Firms in different Sectors

The study compared the summaries of performance of the domestic and foreign firms in order to establish their differences in performance in the three different sectors. Table 4.2 shows the summary of TFP for each sector and Wilcoxon signed-rank test to establish if there was any significant difference between the means of different sectors.

Table 4.2: Summary of Comparative Performance of Domestic and Foreign Firms

Sector	Domestic Firms (TFP)		Foreign Firms (TFP)		Wilcoxon Signed-Rank Test.
	Mean	Std	Mean	Std	Prob > |Z|
Manufacturing	0.88	1.45	1.28	1.14	0.0000
Service	0.78	1.62	0.88	1.34	0.1012
Agriculture	0.91	2.44	1.23	1.01	0.0001

Source: Constructed from the survey Data

Table 4.2 shows that the mean of TFP of manufacturing and agricultural sectors of foreign firms was higher than that of domestic firms. The mean for domestic firms in manufacturing sector was 0.88 while for the foreign firms was 1.28. For agricultural sector, the mean was 0.91 for domestic firms and 1.23 for foreign firms. When tested with Wilcoxon tests, the study rejected the null hypothesis and concluded that this difference between the means in the two sectors was significant. This showed that in these two sectors, foreign firms preformed better than domestic firms. Gachino (2007) also found out that foreign firms in manufacturing sector in Kenya are more productive than domestic firms. However, in the service sector even though the TFP mean of foreign firms was 0.88 and higher than 0.78 of domestic firms, the difference between the means was not significant according to the Wilcoxon test. The study therefore, concluded that the performance of domestic firms and foreign firms in this sector was at par. This was probably because domestic firms had also invested heavily especially in the financial sub sector.

4.3 Regression Results

The model in equation 3.10 in chapter three was then estimated after the diagnostic tests. FGLS method of estimation was used. Table 4.3 shows the FGLS results of the regression analysis for all the firms sampled that is both domestic and foreign.

Table 4.3 FGLS Results of Effects of Firm Ownership on Productivity

TFP	Coefficient	Robust Std. Err.	Z	P>|z|
Foreign ownership	0.3545**	0.3196	1.11	0.027
Skills	0.0136***	0.019	0.715	0.000
Gender Div	0.068102***	0.03478	1.96	0.05
R & Devpt	0.0028**	0.0011	2.25	0.015
Size	9.48e-06**	3.74e-06	2.66	0.008
Sectorial Dummy(Man)	-0.1134	0.2714	-0.42	0.676
Sectorial Dummy (Agric.)	-0.2641	0.5659	-0.47	0.64
cons	4.282***	0.2742	15.60	0.000
No of observations 600				
Number of groups 201				
Wald χ^2 68.30				
Pro>ch 0.0000				

***, ** and * Significant at 1%, 5% and 10% respectively
Source: Constructed from survey Data
***, ** and * Significant at 1%, 5% and 10% respectively

The foreign ownership variable was a dummy variable where foreign firms took the value of one and domestic firms took the value of zero, thus domestic firms acted as the control or the bench mark. From Table 4.3, it can be observed that the coefficient of foreign ownership was positive and significant at 5 percent level. This meant that the productivity of foreign firms was higher by 35.6 percent than that of domestic firms. As expected, the analysis showed that foreign firms were more productive than domestic firms. According to Industrial Organization Theory, when foreign companies invest in another country they face several disadvantages in competing with local firms and for them to be able to overcome these disadvantages, they must be large enough, use patent protected technology and better managerial skills (Kindlerberger, 1969). In addition, according to Hymer (1976), employment in foreign firms is regarded by locals as risky hence they pay higher wages in the host country. These high wages attract the most skilled workers and hence higher productivity, according to H-O ring theory. Therefore, these results are consistent with other studies done by Aitken and Harrison (1999), Koen and Bartoldus (2003), Subash (2006) and Gachino (2007). The study investigated the effect of labour diversity on the firms' productivity by looking at three relevant dimensions namely skills, ethnic diversity and gender diversity, and the implications related to each of the dimensions in terms of productivity. From Table 4.16, the coefficient of ethnic diversity was positive and insignificant, meaning that it was not a major variable that determined productivity of firms. This may be because ethnicity here was looked on the ground of the nationality of employees and very few firms had employees from other countries. This does not give support to the theory by Osborne (2000) which states that labour diversity in terms of ethnicity provides useful information to the firm about national and foreign products and in this way it enhances the firm's ability to compete in global markets. The results of this study were contrary to the findings of the study done in Kenya by Alesina and Ferra (2005) who found that ethnic diversity had major influence on productivity of Kenyan firms.

As expected and consistent with many studies, the coefficient of skills was positive and significant, meaning it is a factor that determines firm productivity. From Table 4.16, increasing firms' skills by one unit, increases firms' productivity by 0.0136. Skilled workers are expected to be more innovative and able to work efficiently and hence their productivity is higher in comparison with the unskilled workers. In addition, skilled workers are able adopt new technology from rival companies more easily and were normally eager to learn. This helped the firm to be more productive. The results are consistent with those studies by Kokko (1993), Lazear (1999) and Alesina and Ferrara (2002). Gender diversity, previously considered a social issue and an issue of image, is increasingly being approached as a value driver in performance of a firm hence another variable that the study was interested in finding its impact. Gender diversity was found to be positive and significant at 10 percent level.

Specifically from Table 4.16, an increase of gender diversity by one unit, increased firms productivity by 0.068. This meant that gender diversity was a factor that influenced productivity of Kenyan firms. As such, in order to be productive, firms should be encouraged to entrench more gender diversity. This supports the business case argument which suggests that gender diversity translates into better decision and ultimately better products (Cox and Blacke, 1991). According to the resource based theory, a firm can gain sustainable competitive advantage if it takes advantage of its valuable, rarely inimitable and non substitutable resources like gender diversity (Barney, 1991). The author noted that gender diversity is a source of intangible and social complex resources that can provide a firm with sustained competitive advantage. The results conform to study done by Kulik and Metz (2008). The coefficient of research and development was positive and significant. An increase in expenditure on research and development by one unit increased total productivity of the firm by 0.0028 units. This showed that firms that spent more money on research and development had higher productivity. This was in support of Griliches (1979) who was the first to consider R&D as a factor of production, arguing that R&D activities add to the existing stock of accumulated knowledge of the firm leading to higher productivity. Wang and Tsai (2004) also found that R&D was a major determinant of firm's productivity using data from 136 manufacturing firms in Taiwan Finally, the coefficient for Size was also found to be positive and significant at 5 percent level. From Table 4.4, an increase in the firm's size by one unit would increase productivity by small margin of 0.000095, but this could make an impact with large volume of firm's production. This implied that size had an influence in the firm's productivity. Baldwin (1997) found that large manufacturing firms are more likely than small firms to introduce both product and process innovation. Boothby, Lau and Songsakul (2008) also showed that the level of R&D rises with firm size.

5.0 Summary and Conclusions

The study found out that foreign firms were more productive than domestic firms. This confirms the theory that foreign firms have massive capital investment, better management and better technology hence their productivity is higher than that of domestic firms. Foreign ownership at firm level which was observed to have significant influence on total factor productivity suggested productive benefits accrued from foreign owners. Diverse labour force is increasingly a reality in Kenya and many developing countries. According to the study, firms that have more labour diversity in terms of skills and gender are more productive. This is a crucial finding given the ongoing debate on the role of gender in development. The finding supports the hypothesis that a firm that has equal number of males and females produces more because they motivate one another unlike a firm with employees of one gender. In addition, diversity in skills and gender benefited the firm due to better decision making, improved problem solving, more creativity and innovation, and more information about markets (Alesina and La ferrara, 2005). Diversity in skills also generated knowledge spillovers and skill complementarities among the employees and hence a positive effect on firm performance. It was also clear from the findings that expenditure in research and development had an impact on firms' productivity and in determining spillovers from foreign to domestic firms in Kenya. Firms should therefore focus more on investing on research and development as this would help them to be more innovative and enable them to have ability to imitate the new technology from foreign firms.

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