

## **FIRM LEVEL DETERMINANTS OF MANUFACTURING FIRMS' GROWTH IN KENYA: 2000-2011**

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### **Abstract**

*Growth of manufacturing firms in Kenya has stagnated in terms of the sector's contribution towards the GDP despite government's efforts in improving the macroeconomics variables. Since major decisions that affect performance and hence growth of the sector, are made at the enterprise level, the study aimed at looking at the firms' level factors (number of employees, leverage, capital stock, labour cost and energy cost) that determine the growth of manufacturing firms in Kenya. The study used secondary data for 30 manufacturing firms captured by World Bank, Kenya National Bureau of Statistics (KNBS), Central Bank of Kenya, UNIDO (United Nations Industrial Development Organization) and Institute of Policy Analysis and Research (IPAR) for the period between 2002 and 2011. The data was analyzed using panel fixed effects model. The study established a positive link between level of capital stock and the growth of manufacturing firms in Kenya. However, the study established a significant and negative relationship between leverage, wage bill, electricity cost and fuel costs and the growth of manufacturing firms in Kenya. On the policy front, the study recommends government to formulate tax policies that make firms realize increased profit so that firms can reduce dependence on credit for investment. The central Government should ensure there is an anti-trust law restricting arbitrary increase in oil prices and also ensure there is good infrastructure especially roads. Firms should embrace capital intensive techniques of production because capital was found to increase the growth of firms.*

*Keywords: Growth, leverage, capital stock, labour cost, energy costs*

## INTRODUCTION

Historically, since the dawn of the industrial revolution, manufacturing has been transforming both countries and companies. Those who could harness its power have achieved great prosperity profitability. As a result of high paying middle- class jobs creation driven by manufacturing following World War II, major industrial powers emerged in North America, Western Europe and Asia with United States, Germany, and Japan evolving as major global manufacturing leaders, These countries were able to reap the reward of industrialization: steady GDP growth prosperous middle class and a rapidly growing service sector fuelled in large part by multiplier effect of the manufacturing innovation ecosystem (World Economic Report, 2012)

Over the past several decades, a rapid globalization has occurred in the global manufacturing ecosystem driving more changes and impacting the prosperity of more companies, countries and people than at any time in the last 100 years. A significant portion of manufacturing has moved from rich countries to emerging economies and this has dramatically changed the competitive landscape for manufacturers. Countries around the world have taken part in and benefited from the rapid globalization of industry and expansion of manufacturing. Globalization of manufacturing has been a key driver of high value job and a rising standards of living for the growing middle class in NICs including China, India, South Korea, Mexico and Brazil. Developed countries have benefited from lower cost products driven by lower wages used for production in emerging markets. According to World Economic Forum Report (2012), manufacturing has been immensely important to the prosperity of nations with over 70% of income variations of 128 nations explained by differences in manufactured products export data alone.

The globalization of manufacturing has been possible due to a number of forces coming together currently. These include: significant change in geopolitical relations between West and East The widespread growth of digital information, physical and financial infrastructure, computerized manufacturing technologies and proliferation of bilateral and multilateral trade agreements (Collins, 2010). These factors have enabled disaggregation of supply chain into complex global networks allowing a company to interact in the design, .sourcing of materials and components and manufacturing of products from virtually everywhere while satisfying customers almost anywhere(World Economic Forum Report, 2012). In most of African economies, manufacturing plays a minor role often limited to small firms and simple products for example baked goods, apparel, and basic furniture among others. There are many reasons for this poor performance including uncertain macroeconomic environments, excessive regulation acting as brake on growth and poverty skewing domestic demand towards simple necessities (Maritz, 2011).

King (2010) found that in the period between 1981 and 1994 overall GDP per capita in Africa fell by 0.6% a year. During the same period, manufacturing declined at a rate of 1 % per year. Between 1995 and 2008 the performance of manufacturing sector somehow improved. It grew by 1.7 percent a year on per capita basis. Between 2001 and 2010; the average growth rate was 2% (World Bank, 2011). African manufactured exports have also been weak. While Sub Saharan Africa (SSA) is home to around 12% of world population; its share of world manufactured export is less than 1 %. In the year 2008, there were only five countries in SSA- Mauritius, Madagascar, Cape Verde, South Africa and Angola- that exported more than US\$ 100 of manufactured goods per capita. For most countries the figure was below US\$10 per capita and only in three countries -Mauritius, Madagascar and Cape Verde - where manufactured goods constitute more than 30% of exports King, 2010).

Since independence, the Kenyan economy has remained predominantly agriculture, with industrialization remaining an integral part of the country's development strategies. The industrial sector's share of monetary GDP has remained about 15-16% while that of manufacturing sector was about 10% in the period between 2010 and 2012(Economic Survey :2013). This shows that Manufacturing activities account for the greatest share of industrial production output and form the core of industry. By the year 2008, Kenyan manufacturing sector had 2,308 firms, 87% were active and majority was Kenyan family owned and operated. The top three manufacturing subsectors accounts for 50%of sector GDP, 50% of exports and 60% of formal employment, These sub sectors are Food, Beverages and tobacco, metal and Allied subsector and leather products and footwear subsector (Osano, 2008).

Manufacturing sector in Kenya has seen the best and worst of times. In early years of independence, the policy for industrialization was the import substitution strategy which was pursued in 60s and 70s. This strategy was a continuation of colonial administration industrial strategy of protecting infant industries. The initial impact of this policy on the growth of the sector and economic growth was positive. On average the growth rate averaged 6% in the 60s and 4% in 70s while in the 1960s manufacturing value added was 11.7% per annum and 4.9% in 1970s. However, excessive government control mechanism put in place to support this strategy shifted further economic growth. This was because these controls were too much inward looking inhibiting external competition. The collapse of EAC in 1977 further compounded the problem by making smaller the domestic market for manufacturing goods. This resulted in under-utilized capacity and was clear indication that import substitution strategy was not achieving its objective of creating employment and poverty alleviation (Ronge and Nyangito, 2000).

In 1986 the government came up with Sessional paper No.1 on economic management for renewed growth which spelled out strategies to remove distortions, created by -import substitution policies. This Sessional Paper laid down policies for trade liberalization. Example of such policies included the adoption of competitive exchange rate and export promotion incentives such as manufacturing under bond, the "green channel system" for administrative approval, export processing Zones and export compensation schemes. By 1989, these incentives to export had not become fully operational. Their effectiveness was hampered by the lack of fiscal discipline which resulted in macroeconomic imbalances which had a negative impact on investments. Nevertheless there was an increase in manufactured exports between 1985 and 1990(Government of Kenya, 1986). During the 1990s, weaknesses in implementing the reform reversed all the previous achievements in the manufactured export sector. The growth in manufacturing value added fell from 5.2% in 1990 to 1.2% in 1992 while GDP growth fell from 4.2% in 1990 to 0.4% in 1992. The decline made government to undertake far-reaching reforms in 1993 which had been agreed upon with donors. Such policies included tariff reductions, liberalization of foreign exchange market and privatization of public enterprises. In the period between 1994 and 1996, the reforms seemed to work. The growth of the manufacturing value added rose from 1.2% in 1992 to 1.8% in 1993 and 1.9% in 1994. In 1995 and 1996, manufacturing value added grew by 3.9% and 3.7% respectively while total GDP grew by 4.8% and 4.6% respectively (Ronge and Nyangito, (2000)

By 1997, poor governance caused a decline in the achievements already made. Infrastructure deteriorated and rent seeking was rampant. This increased unit cost of manufactured products and increased competition from imports seriously hurting manufacturing sector. The problem was further compounded by IMF withdrawal citing lack of transparency in the reform process Ronge and Nyangito, 2000). The Kenyan economy started showing signs of recovery in 2003. Between 2002 and 2005, economic growth rate averaged 3.6% and the average growth rate of manufacturing sector was 2.45%. In the period between 2006 and 2012, the economy grew by an average rate of 3.9% while manufacturing sector on average grew by 4.2 % (Economic Survey 2012).

In the year 2012, there was a net increase of 6244 new formal manufacturing sector jobs compared to 3656 new jobs generated in 2011. The value of output increased by 2.6% from 1015.5 billion in 2011 to 1042.2 billion in 2012. Total employment in the sector was 277900 people which represented 13% of the total employment in the economy with additional 1.6 million people employed in the informal side of the industry (Economic Survey 2012). In the Kenya's Vision 2030, the government aims at transforming manufacturing sector into a robust, diversified and competitive sector to support the country's social economic development agenda

by creating jobs, generating wealth, and attracting Foreign Direct Investments (FDI). In addition, the sector will continue to provide impetus towards achievement of the Millennium Development Goals (MDGs) in both the medium and long term, particularly the goal on Eradication of Extreme Poverty and Hunger and goal on Global Partnerships for Development. Over the Medium Term Plan (MTP) period 2008-2012, the overall goal of the sector has been to increase its contribution to Gross Domestic Product (GDP) by at least 10 per cent per annum. These objectives were to be achieved by: Strengthening production capacity and local content of domestically- manufactured goods; increasing the generation and utilization of Research and Development (R&D) results; raising the share of products in the regional market from 7 to 15 per cent; and developing niche products for existing and new markets (Government of Kenya, 2008).

### **Statement of the Problem**

Industrialization has remained an integral part of the Kenya's economic development strategy. Since independence the government has been implementing industrialization policies aimed at creating conducive macroeconomic environment that encourages investment in manufacturing sector. In 1960s and 1970s, the policy was import substitution that aimed to protect infant domestic industries. This policy proved too much inward looking hence domestic goods were not competitive in the external market. Due to the failure by import substitution policy, the government laid down policies for trade liberalization: allowing for competitive exchange rate, export compensation schemes and export processing zones. These policies were captured in sessional paper No 1 of 1986 but their effectiveness was hampered by lack of fiscal discipline which had negative impact on investment especially in manufacturing sector. In 1990s poor governance resulted in prices of manufactured goods increasing because infrastructure deteriorated and rent seeking was rampant (Ronge and Nyangito, 2000). Resulting from failure of these policies, the contribution of industrial sector to GDP has remained about 15% while that of manufacturing sector has stagnated at 10% since independence. This stagnation has persisted despite efforts to improve the macroeconomic variables such as interest rates, maintenance of stable exchange rate, offering of export incentives and improvement in socio-economic factors such as security and political stability. Kibet and Elijah (2003) found that most firms in Kenya's manufacturing sector continue to produce far below their full capacity. Majority of the firms rarely use more than 60% of their industrial capacity. Generally, the manufacturing firms have capacity utilisation of less than 40%. The failure by the Government not to focus on internal factors could be the reason why manufacturing sector's growth has stagnated. Most of the studies done on manufacturing sector in Kenya have not investigated firm level determinant on growth of

manufacturing sector . Muluvi (2011), investigated firm level determinants of investment in the Kenyan Manufacturing Firms. He also investigated firm level determinants of exporting behavior of manufacturing firms in Kenya. Kibet and Elijah (2003) investigated the economic performance in Kenya's manufacturing sector. This study investigated firm level determinants that affect growth of manufacturing firms' growth in Kenya.

### **General Objective of the Study**

The overall objective of the study is to empirically examine the determinants of manufacturing firms' growth in Kenya.

### **Research Hypothesis**

**H<sub>1</sub>:** The number of employees has no effect on the growth manufacturing firms

**H<sub>2</sub>:** Leverage has no effect on the growth of manufacturing firms

**H<sub>3</sub>:** Capital stock has no effect on the growth of manufacturing firms

**H<sub>4</sub>:** Labour cost has no influence on the growth of manufacturing firms

**H<sub>5</sub>:** Electricity cost does not influence the growth of manufacturing firms

**H<sub>6</sub>:** The cost of fuel has no effect on the growth of manufacturing firms.

## **LITERATURE REVIEW**

### **Theoretical Framework**

After Robert Gibrat's (1931) publication, Gibrat's law received huge attention in the empirical industrial organization literature. Gibrat's (1931) theory of law of proportionate effect (LPE) was formulated when he observed lognormal distribution of French manufacturing establishments. It states that the expected growth rate of a given firm is independent of its size at the beginning of the period examined. In the words of Mansfield (1962), the probability of a given proportionate change in size during a specified period is the same for all firms in a given industry regardless of their size at the beginning of the period.

Thus, according to Gibrat's law, firm's growth is stochastic in nature and unpredictable. The law has three main propositions: (i) that firms of different size classes have the same average proportionate growth (i.e., small and larger firms have the same growth rate); (ii) that the dispersion of growth rates about the common mean is the same for all size classes; and (iii) that there is no serial correlation in growth rates. According to the law, growth is unrelated to firm size, so that large and small firms have equal probabilities of attaining a particular growth rate within any given period. Over time, however, some firms will be lucky and tend to enjoy an above average share of high growth rates, while others are unlucky and tend to remain the



same size or decline. Concentration can therefore be expected to increase naturally over time and skewed firm size distribution will be observed.

Gibrat's law is challenged by Bain (1956) who argues that there is a Minimum Efficient Scale (MES) which is achieved when a firm attains a size corresponding with the minimum long run average cost. Firms with sizes smaller than the MES enjoy economies of scale until they reach the MES but all firms beyond the MES are characterized by constant returns to scale. Hence, firms below the MES experience growth relative to those with the optimal size, where there is no growth, contradicting Gibrat's law. According to the MES argument, there is no growth once a firm achieves its MES since sizes higher than MES are associated with loss. This is the neoclassical theory of firm growth. The dispersion of firm size will be small (due to non-optimal behavior), and this dispersion will become smaller over time, as firms converge towards the equilibrium size. Thus the prediction from the neoclassical theory of the firm is that firm size will in the long-run converge towards some optimum size.

The other theoretical work is associated with Lucas (1978) and Jovanovic (1982). Lucas's thesis is that the equilibrium size distribution of firms depends on the distribution of managerial capabilities within a population. According to this argument, any firm size may be optimal given its manager's ability. Jovanovic formulate a learning model based on the Lucas theory. According to him, firms learn about their efficiency levels once they are established; managers guess their firm efficiency from a distribution of efficiency rates. As managers learn from their past guesses they update their information base and formulate better guesses in the future. Jovanovic firstly developed model is called a model of passive learning which initially explores unknown, time-invariant characteristics which may affect firm's decision on its strategy exit, grow up or down. The process of learning narrows the variance between the guessed and the actual levels of efficiency as firms grow older. According to Jovanovic (1982), younger firms have more variability in their growth rates and they will grow faster than the older firms. The model, therefore, predicts a negative relationship between age and firm growth.

Jovanovic's model is not without limitation. The problem with the model is that it is static as it keeps the efficiency parameter fixed. Later on, Pakes and Ericson (1987) proposed this parameter to have some dynamic nature. According to Pakes and Ericson (1987), stock of human capital is better placed to make the best guesses, implying that they are capable to run their firms more efficiently. As a result, firms with high human capital register higher rates of growth relative to those with low human capital.

The model used in this study is Gibrat's law (1931). First, the model is preferred because Gibrat used data from French manufacturing firms to develop his model. Secondly, the model is preferred due to its simplicity and thirdly, it uses relative instead of absolute measure of growth

(Relander, 2011). Gibrat's Law show how firm's growth depends on random shocks that are independent of each other and on initial firm size. Gibrat's model is written in the following form:

$$\Delta \text{Log } S_{i,t} = \log S_{i,t} - \log S_{i,t-1} = \mu_{i,t} \text{ where } \mu_{i,t} \sim N(0, \delta^2)$$

Where:

$S_{i,t}$  -is the firm size measured in number of employees working in a firm "i" in a period "t".

$\mu_{i,t}$  is normally distributed random variable with mean zero and a variance of  $\delta^2$

Equation 1 above implies that change in the size of the firm (the growth of the firm) IS determined by unpredictable random variable which is normally distributed with a mean value of 0 and a variance of  $\delta^2$ . This random variable is caused by random shocks.

The random shocks affect all firms equally irrespective of their size. Examples of such shocks are technological shock, weather shock and natural disaster, monetary shock, political shock and taste shock.

Equation (1) implies that an unexpected shock can occur because:

- i. We do not know what will happen, or
- ii. We know what will happen but we do not know when it happen (Geroski, 1999). This means the process is hard to predict.

This equation means that the unexpected shocks have permanent effects on the size of the firm. Another way to illustrate this is to decompose each size until the period of creation ("t"=0):

$$\text{Log } S_{i,t} = (1 + \mu_{i1}) \log S_{i,t-1} = \text{Log } S_{i,0} (1 + \mu_{i1}) (1 + \mu_{i2}) \dots (1 + \mu_{it})$$

Rearranging this equation, we get:

$$\text{Log } S_{i,t} = \text{Log } S_{i,0} + \sum \mu_{i,s} \text{ if } \log (1 + \mu_{i,s}) = \mu_{i,s}$$

Where the logarithm of the employees working in a firm in a period "t" ( $S_{i,t}$ ) depends on two factors:

- i. The initial firm size ( $S_{i,0}$ ) measured in terms of the number of employees, and
- ii. A set of random terms ( $\mu_{i,t}$ ) which are the same for all active firms in the market and independent of firm size.

Consequently, Gibrat's Law is characterized by a first-order Markov Process, which does not imply a serial correlation between the different temporal rates of firm .

Any firm "i" is therefore the sum of all the shocks (both expected and unexpected) the firm has received since its creation. Because of the unpredictable nature of these shocks, it is difficult to predict the future firm size.

Gibrat's Law predicts that all firms have the same likelihood of growth, regardless of their initial size. If this result is extrapolated to the future, it is seen that the market will tend to concentrate because the largest firms will increase their weight in the market. This means that firm size will inevitably become log-normal (right skewed) because of the central limit theorem. Due to



random event, firms will eventually diverge in size, and the market concentration will increase even though the firms' growth prospects are still the same.

There are three equations that confirm Gibrat's Law.

Firstly, the logarithm of the number of employees belonging to firm "i" during the period "t" ( $S_{i,t}$ ) depends on the logarithm of the number of employees from the previous period ( $S_{i,t-1}$ )

$$\log S_{i,t} = \alpha + \beta \log S_{i,t-1} + \mu_{i,t} \quad (4)$$

Gibrat's Law is accepted as long as coefficient  $\beta$  is equal to 1, so firm growth is independent of initial size. If  $\beta$  is less than 1, the smaller the firm, the higher the growth. If  $\beta$  is more than 1, the larger the firm, the faster the growth.

Secondly, firm growth has also been estimated as a function of initial size. The growth of the firm is obtained during the periods "t-1" and "t" ( $\log(S_{i,t})$ )

$$\log S_{i,t} = \alpha + \beta \log S_{i,t-1} + \mu_{i,t} \quad (5) \quad \Delta$$

If Gibrat's Law is satisfied,  $\beta$  will be equal to 1. A positive value implies that larger firms will grow more than smaller firms, so there will be a divergence in firm size. A negative value implies that smaller firms will have a higher growth rate than larger firms, so there will be convergence in the industry.

Thirdly, there is another dynamic model of firm growth that is linked to the implication of the absence of any dynamics associated with lagged dependent variables:

$$\log S_{i,t} = \alpha + \mu_{i,t} \quad (6)$$

Where the logarithm of the growth in the period "t" belonging to firm "i" depends on the firm growth rate from the previous period. In this case, Gibrat's Law is accepted if  $\beta$  is equal to 1. Both equations have an error term ( $\mu_{i,t}$ ) that depends not only on the period of time but that is also individual to each firm.

### **Justification for use of sales growth rate as the dependent variable**

Gibrat's law uses number of employees to measure the growth of the firm. This study instead uses sales growth rate as the dependent variable because a number of scholars have noted that the diversity of measures used in firm growth studies severely impairs the ability of scholars to accumulate and compare result. The first problem concerns the choice, validity, and reliability of different growth measures as determined from theoretical and methodological perspectives (Coad 2010).

Based on extensive reviews of the literature, Clark (2010) and Collins (2010) arrive at almost identical lists of possible growth indicators: assets, employment, market share, physical output, profits, and sales. First, the use of sale as a measure of growth is the most widely used in empirical growth research. Other indicators have some obvious shortcomings that limit their

applicability outside of very special contexts. For example, such indicators as market share and physical output can only be compared within industries for firms with a similar product range. Using an indicator such as total asset value is highly related to the capital intensive firms and sensitive to changes over time while using employment is biased to labour intensive firms. Although profits are an important indicator of success, the relationship of profits to size is only evident in aggregates of firms or over long periods of time for individual firms.

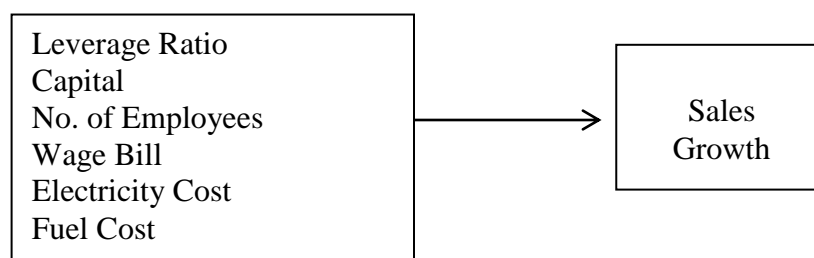
There seems to be an emerging consensus that if only one indicator is to be chosen as a measure of firm growth, the most preferred measure should be sales (Ardishvili *et al.* 1998 ). It is relatively easily accessible and it is relatively insensitive to capital and labour intensive firms. It has been argued that sales are also the indicator favoured by entrepreneurs themselves (Acs and Audretsch, 1990). This is related to another argument, namely that demand and, therefore, sales is a precursor of growth in other indicators, i.e., the nature of the growth process itself points to sales as a natural choice.

The second problem is to choose whether to use absolute or relative measure of growth. Some studies might rely on measuring growth as absolute sales growth whereas other studies rely on relative sale growth measured over a time period (Coad, 2010). The choice of absolute or relative growth is especially important for the relationship between size - and anything correlated with size - and growth. Absolute measures tend to ascribe higher growth to larger firms whereas smaller firms more easily reach impressive growth in percentage (i.e., relative) terms. The measure of growth used in this research is the rate of growth of firm sale.

### Conceptual Framework

The figure below shows a diagrammatic representation of the relationship between the variables. We have the Leverage, Capital, Number of Employees, Wage bill, Electricity Cost and Fuel Cost as independent variables and firm's growth (sales) as the dependent variables .The growth of the firm is best represented by sales because sales are unbiased to both capital intensive and labour intensive firms.

Figure 1. Conceptual Framework



## RESEARCH METHODOLOGY

The research study design was historical since it investigates on the firms' growth and used secondary data. The research covered 30 manufacturing firms captured by World Bank in Kenya from the year 2002 to 2011. The firms were selected purposively with hindsight of selecting manufacturing firms that were more than ten years old in the market.

### Empirical Model: Panel Data Estimation

The basic regression model used is given as:

$$G_{it} = a + b_1 X_{it} + v_i + \delta_t + U_{it}$$

Where:  $a$ - the constant.

$G_{it}$  -Growth of the firm.

$X_{it}$  - set of explanatory variables which include Leverage, Capital, Number of Employees, Wage bill, Electricity Cost and Fuel Cost.

$v_i$  - firm fixed effects(these are effects that differ across firms but are time invariant e.g. managerial style and location of a firm)

$\delta_t$ - time fixed effects.(these are effects that do not differ between firms but are held time invariant)

$U_{it}$  - is the error term.

## EMPIRICAL RESULTS AND DISCUSSION

Table 1. Inferential Statistics

Variable	Coefficient	St Error	TY- Statistics	P-Value
Constant	13,824	4.200	0.001	0.126
DL Average	-0.014	0.0071	-1.98	0.022*
Capital	0.850	0.02351	3.62	0.000*
Wages	-0.08	0.0379	-2.11	0.035
Employees	-0.004	0.00834	-0.53	0.597
Eleccost	-0.203	0.0996	-2.04	0.016*
DFuel Cost	-0.209	0.0108	-10	0.0014

Adjusted R2 is used to compensate for the addition of variables to the model. The Adjusted "Z" is attempting to account for statistical shrinkage. Models which are over-parameterized tend to perform better in sample than when tested out of sample

### **Leverage and Growth of Firms**

From the regression results above, the coefficient of leverage is negative and significant at 10% level of significance. The results show that a unit increase in leverage ratio leads to a 1 % decline in growth rate for sales. This negative effect of leverage on growth of manufacturing firms may be explained by the suggestion that highly leveraged firms are softer competitors that will curtail investment (Myer, 2003). This conforms to findings by Lang, Ofek and Stulz (1996) that show a negative relationship between leverage and growth in large manufacturing firms. They argue that leverage has a negative impact on firms' future growth because the presence of debt prevents managers from overinvesting.

The negative relation between leverage and growth at the firm level raises the question of whether leverage uniformly lowers growth regardless of whether a firm has good investment opportunities. Much of finance theory implies that leverage should have less of an effect for firms whose valuable investment opportunities are recognized by the capital markets. In contrast, leverage should have a negative effect on growth for firms doing poorly because of lack of recognized investment opportunities, poor managerial performance, or other reasons. The cost of capital of these firms increases with their leverage because in contrast to firms with valuable investment opportunities, it is not clear that funds raised externally will be used profitably. The alternative hypothesis is what we call the 'naive liquidity effect' namely that leverage reduces investment and growth irrespective of investment opportunities. A related liquidity argument is that leverage should reduce growth more for firms with valuable growth opportunities, because such firms have greater informational asymmetries, thus outside funds are more expensive for them (Myer, 2003).

### **Capital and Growth of Firms**

Capital stock is shown to have a positive and significant effect on firm growth. Since the coefficient of capital is 0.85, it implies that a unit increase in capital will cause the growth rate of sales to grow by 85%. This result is consistent with what Mengistie (2011) found- that total assets, a proxy for capital stock, has a positive influence on growth of manufacturing firms. Machine and equipment is a fundamental component to growth of manufacturing sector. It includes all types of machines and equipment that are used in production of goods. Machinery and equipment is found in all sub-sector of the manufacturing industry. It plays an intricate role in the development of long term social and financial welfare through its impact on productivity growth.

Investment in advanced Machinery and equipment help a firm achieve their strategic aim since it stimulate a number of variables that directly contribute to productivity improvement such

as labour and related skills, Research and Development, competition and innovation. Machinery and equipment can influence labour by requiring higher skilled workers for operation and development. It influences Research and Development by acting as an instrument for exploration and discovery, and finally it indirectly stimulates competition and innovation through reorganization and advancement of products and services.

Investment in advanced capital (machines and equipment), helps a firm to produce its products more efficiently because improved machinery aid in reduction of waste and cost. If a firm has been outsourcing some work, after investment in advanced capital, the firm is able to bring that previous outsourced work in- house. The firm is also able to produce for a range of specifications which makes the firm to produce a wide range of quality products (Hopley, 2012). Firms investing in capital report an increase in productivity and improved profitability. This allows firms to have a more competitive offering in the global marketplace, leading to an increase in sales and profitability. Increased profitability then puts the firm in a better cash flow position, allowing companies to further invest in the capital equipment needed for their business. Therefore, investment in advanced capital has a positive effect on the growth of manufacturing firms.

### **Wage Bill and Growth of Firms**

The effect of wage bill on the sales of Kenyan manufacturing firms is negative and significant at 10% level of significance. The findings imply that, if the wage bills of Kenyan manufacturing firms increase by 1%, the growth rate of a manufacturing firm measured in terms of sales growth rate, decline by 8%. This outcome is consistent with the result of a study by Giovanni (2003). His study on the determinants of international competitiveness of Italian manufacturing firms found that labour cost has a negative effect on the competitiveness of the firm internationally and domestically. This is because increase in wage directly increases the cost of production and the price of the product being manufactured.

This negative relationship is due to a number of reasons. One such reason is elasticity of demand for the firm's product. Elasticity of demand is a measure that defines the ability of a product to withstand a change in its price. The more inelastic the demand for a product the less its demand (sales) will be affected by an increase in its price. Therefore, organizations with a product that is relatively price inelastic, can afford higher costs of labour (wage level) that can be passed on in the form of price increases in the final product. But if the demand of the product is elastic, an increase in price will greatly reduce its demand and therefore sales.

The cost of living makes worker agitate for higher wages. Conversely, some firms may be more able to keep wages at a certain level in line with increases in the cost of living while

others are unable. If firms are not able, workers will demand increment even if the firm has not realized an increase in productivity. This will make the firm increase the price of its product and sales will dwindle. Legislative influence is another factor that causes wage affect growth of manufacturing firms negatively. Minimum wage laws usually introduced by the government are usually aimed at improving the welfare of the workers in terms of higher wages. In addition, legislative requirement such as pay equity and employment equity increase the administrative burden and cost to the employer. These costs increase the wage bill of a firm and therefore, the price of its product increases hence sales reduce. The wage community, in which a firm belongs, also affects the wage bill. The wage community consists of employers who compete for the same labour, in the same geographical area and who compete in the product market. If a particular labour is scarce, its compensation will increase due to competition between employers. When this happens, the firm will increase the price of its product and consequently, sales decrease.

### **Electricity and Growth of Firms**

The impact of electricity cost on Kenyan manufacturing firms' growth is negative and significant at 10% level of significance. This outcome reflects the fact that increases in the cost of electrical energy causes a negative rate of growth of manufacturing firms. The most direct role of energy is that of an input to production. In effect, a world without electricity amounts to non-mechanized production. Erratic supplies of electricity disrupts production while voltage fluctuations negatively affect the durability of machines. Hence firms incur extra cost of plant and machine maintenance or replacement.

Due to power' cuts, firms incur expenditure on mitigating facilities e.g. generators and power back-ups. These mitigating facilities imply that there is additional maintain ace cost incurred by manufacturers as a means of generating electricity in case of power cuts. Firms also incur inventory cost. In order to have power back-ups and generators facilities ready for any power cut or shortage, firms need to have inventories of fuel available for use of these machines and facilities (FCCI, 2012).

As a result of these additional costs, manufacturing firms loose competitiveness both in the international and domestic markets. This is due to the fact that increase in cost of energy increases the cost of production and by extension raises the price of the products hence demand reduces. This reduces sales and consequently manufacturing firms' growth is affected negatively.



### **Fuel Cost and Growth of Firms**

The results further suggest that the relationship between sales growth rate and fuel cost is negative and significant at 10% level of significance. It shows that if the cost of fuel rise by 1 %, sales growth rate of Kenyan manufacturing firms is likely to decline by 2%.

Several reasons account for this negative relationship. Increasing fuel expenses, increase in transportation cost, the cost of raw material and decreases the quantity of materials utilized by manufacturing firms. In a study by Bolaji and Bolaji (2007) on Nigerian manufacturing firms showed that in Nigeria, the increase in prices of oil increase the cost of raw materials of 80% of the companies, 40% of these companies experienced high increase and 40% of the companies experienced low increase while the cost of raw materials of the rest 20% were not affected.

When the price of the petroleum products increases, most of the manufacturing firms reduce their production capacity. This can be because the production cost increases and some firms might not be able to finance large production as before. The management of most firms reduces the output out of pessimistic expectations of high prices of their products. In Nigeria, 90% of the manufacturing companies experiences reduction in their production capacities due to the hike in oil prices (Bolaji and Bolaji, 2007).

Although a big proportion of the cost of fuel is directly linked to production and distribution, a sizeable portion goes to activities not directly related to production and nevertheless the cost is passed on to consumers. The producers usually pass the increased costs to consumers inform of higher prices of finished goods. Therefore, increase in price of oil products has a negative effect on the growth of manufacturing firms.

The overall effect of price increase of petroleum products to the manufacturing firms is that the market demand of their products reduces because the products become less competitive due to increase in price. This reduces the sales and as a consequence profits plummets.

### **Employees and Growth of firms**

From the regression result, the number of employees is not significant at 10% level of significance. This implies that the growth of a firm is not influenced by the number of employees it has employed. This result vindicates the Gibrat's law which postulates that the growth of a firm is independent of the size of the firm. The size of the firm is measured in terms of number of employees. The insignificance of the number of employees can also be explained by the fact that what matters for firms to grow is not the number of employees but the quality of staff that a

firm has. It is the quality of employees that increases the labour productivity which is vital in making the products of a firm more competitive in the market.

## **CONCLUSION**

The study sought to establish the firm-level determinants of manufacturing firms' growth in Kenya. Using leverage ratio, wage bill, capital stock, number of employees, electricity cost, and fuel cost, the study established how these factors affect the growth rate of manufacturing firms measured in terms of sales growth rate. The result shows that leverage ratio, capital stock, wage bill, electricity cost and fuel costs are significant determinant of growth of a firm. Number of employees is found to be insignificant.

There is a negative relationship between leverage and the growth of firms. This is consistent with the result of Ofek and Stulz (1996). They argued that high leverage ratio prevents managers from overinvesting and that borrowed funds are not used in production as was intended. From the result, capital is positively related to growth of firms. This is consistent with the result of Mengistie (2011) who researched on firm level determinants of growth of manufacturing firms in Ethiopia. The positive and significant effect of capital is because investment in advanced Machinery and equipment help a firm achieve their strategic aim since it stimulate a number of variables that directly contribute to productivity improvement.

According to the result, wage bill affects growth of manufacturing firms negatively. An increase in wage will, in manufacturing sector, decrease its rate of growth because the products become less competitive in the market. Electricity and fuel costs affect the growth of manufacturing firms negatively. When the price of electricity and fuel increase, the production and transportation costs of manufactured goods will increase and this makes them less competitive in the market. The combined effects of oil price shock and reduction in electricity generated would reduce overall growth rate of the manufacturing sector by 2% points on annual basis in Uganda (Twimukye and Matovu, 2009). The total sales of each firm will reduce and consequently their growth decreases.

## **POLICY RECOMMENDATIONS**

On the policy front, the government should set out a modern industrial strategy that sends a clear signal to business and encompasses key policy areas such as cost of energy, credit condition, qualified staff and on improvement of infrastructure especially roads. The industrial strategy should not only drive all parts of central government to supporting the growth of manufacturing sector, but it should provide a clear framework for local growth priorities.

The government of Kenya should minimize uncertainty about future policy changes. Policy changes stemming from the East African Community add to the instability in the business environment. Minimizing this uncertainty needs to be a priority and Kenya need to provide a strong voice in East Africa. The government must boost efforts to shape the future direction and focus of EAC institutions to ensure they are committed to improving competitiveness and build a coalition of Member States to make a stronger commitment to deregulation. This will boost sales by providing a strong, predictable and bigger market. Specifically, the study recommends that since leverage has negative influence on growth, firms should strategize on how to finance their growth using internal finance and not rely on external funds. For instance, firms can plough back their profits. Secondly, firms should make sure that borrowed funds, meant for investment in production, are not diverted to other functions.

The government should reform the tax policies such that manufacturing firms are left with more profit. When firms are left with more money they can invest in research and development making firms able to introduce new products and improve the quality of existing products. The cost of energy is a significant cost of production for some types of companies, particularly energy intensive industries such as steel industry. High costs make it more difficult for investments to reach hurdle rates and achieve the required payback periods. About 22% of the prices of the petroleum products are due to government taxes (Battese and Lundvall, 2007). These fees can be reduced if alternative sources to the treasury are ensured. Sixty seven percent of the price of gasoline reflects the price of purchasing fuels on the international market. The government cannot control the price in the international market but it could adopt a clear public strategy of how and when to purchase so as to minimize price increases and volatility and the government should develop efficient transport system.

The management of manufacturing firms should initiate programs for reducing energy consumption per unit of output e.g. encouraging more efficient vehicles. Individual firms should work out on measures to reduce fuel consumption especially to areas that are not directly linked to production. This will make energy costs a small share of total cost. The central government should ensure that there is an anti-trust law, which would restrict arbitrary increases in the prices in the country. The government should encourage the private sector by provision of incentives for the establishment of more refineries in the country.

Firms need to diversify and source for alternatives to the petroleum products they are currently using in their companies. They also need to support on-going research on alternative fuels in our various institutions and research centres. Firms should invest in more capital since machines seem to be more efficient given the fact that capital has positive and significant influence while number of employees, the proxy for labour, has a negative and insignificant

relationship with firms' growth. Manufacturing nowadays need fewer hands on ground because it has become more capital intensive. The firms need more service workers in research and development, product development, market research, sales and marketing and other fields. The government should bring down the cost of living so that workers do no press for higher wages through their trade unions. This can be achieved through adoption of policies that aim at driving down prices of basic goods and services that form the largest portion of household budget. For example; the price of food should be controlled by avoiding imports which exposes the economy to international food prices and support expansion of domestic agricultural production e.g. by encouraging banks and private sector to invest in agricultural sector making a shift from low-profit traditional agricultural practices to more economical and less water intensive products that can grow in arid areas.

### AREAS FOR FURTHER RESEARCH

This study recommends further research to be conducted to ascertain the effect of international policies on growth of manufacturing sector in Kenya and by extension, in Africa as a whole. Policies by world bodies like WTO should be scrutinized as they affect trade between nations. The other area that the study suggests for further research is how Foreign Direct Investment (FDI) affects the manufacturing sector in Kenya and in Africa.

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