

**THE EFFECT OF PRODUCT INNOVATION ON THE  
PROFITABILITY OF PRIVATE MANUFACTURING FIRMS IN  
NAIROBI COUNTY**

**BY:**

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## **DECLARATION**

This research project is my original work and that it has not been submitted for a degree in any other university or any other assessment award for a degree at this or any other university.

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**Date.....**

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This research project is presented for examination with my approval as the university supervisor.

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## **DEDICATION**

I dedicate this work to the almighty God for his abundant grace and enabling me to complete this project. My Parents thank you for your sacrifice to see me through school. May the almighty God bless you.

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## **LIST OF ABBREVIATIONS**

<b>GDP</b>	-	Gross Domestic Product
<b>KNBS</b>	-	Kenya National Bureau of Statistics
<b>ROA</b>	-	Return on Assets
<b>ROE</b>	-	Return on Equity
<b>R&amp;D-</b>		Research and Development
<b>SMEs-</b>		Small and Medium Sized Enterprises

## **ABSTRACT**

The main objective of this study was to determine the effect of product innovation on the profitability of private manufacturing companies in Nairobi County. There are 378 private manufacturing companies registered with Kenya Association of Manufacturers. Out of this, a sample of 45 private manufacturing companies was selected using convenience random sampling which was approximately 11.9% of all the private manufacturing firms in Nairobi County. Descriptive research design was used and primary data was collected using questionnaires. A total of 45 questionnaires were sent, filled and picked. There were 32 questionnaires that were filled therefore representing a 71.11% response rate. Descriptive statistics such as mean, medium, and standard deviation was used to describe the data collected. Data presentation was done by the use of percentages and frequency tables. The study found a positive and significant correlation between product innovation and ROA. The findings also revealed that the correlation between inflation rate and ROA is negative and significant. Cost of production was also found to be negatively and significantly associated with ROA. The study concluded that product innovation has positive effects on profitability. Hence, recommended that manufacturing companies should invest more on product innovation practices as it improves financial performance and also improve their competitive advantage. The study suggest that further study should be done considering all counties since this study only focused on companies in Nairobi Country hence further study on effects of product innovation on Profitability need to be done in the Country.

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# **CHAPTER ONE: INTRODUCTION**

## **1.1 Background of the Study**

Innovativeness is considered as a crucial instrument of growth strategies that organizations need to venture into new markets, increase the current market share and ensure that the company continues to enjoy increased profitability. Innovation not only contributes to profitability but also to more industrious manufacturing practices, improved performance in the market and seeks to maintain positive status in customers' opinion. Innovations offer firms with a planned course to rise beyond the troubles they come across while pushing to realize sustainable competitive edge (Drucker, 1985; Hitt et al., 2001; Kuratko et al., 2005).

According to disruptive innovation theory (Christensen, 1997) product innovation creates a fresh market and significant proposition thus displacing reputable organizations, goods and alliances; as a result a firm deploying a disruptive innovation shall enjoy improved profitability. Innovation is important to all organizations but particularly for manufacturing companies. An organization that innovates is bound to grow as well as surprise and delight the customers with new, differentiated and relevant benefits (Sharma, 2009). The proposed study shall seek to explore the effect of product innovation on profitability of Kenyan manufacturing firms.

### **1.1.1 Product Innovation**

Product innovation is the introduction of new products to the market, redesigning already well-known goods, or make use of improved resources in the production of goods that are already in the market. Daneels & Kleinsmith (2001) defined product innovativeness

as product that possesses newness or a degree of newness. Product innovation refers to a product which is new, at least in some respects if not all, for the market which the product is being introduced. Innovation is driven by customer and market requirements as well as competition among suppliers in order to satisfy a certain need. Technology evolution is key in innovation of products and services (Adner and Levinthal, 2001). Innovation does not have to arise from new discoveries but it can result from products processes and organizational changes and a combination of technologies that are already in existence (Zizlavsky, 2011).

Product innovation is key if an organization desires to be differentiated from its competitors, or it can be put across that, for an organization to remain competitive then it must consistently innovate new products and services. An improvement in product innovation leads to improved revenue growth, share performance and market capitalization, and profitability. (Drucker, 1985)

Product innovation may be measured in a number of ways; there are both input and output measures of innovation. Research and development expenditure is an input measure of innovation; while the number of new or redesigned products introduced into the market, the percentage of revenue from new or enhanced products and overall firm performance are some of the output measures of product innovation. Another potential set of output measures are intellectual property such as patents and trademarks registered (Zizlavsky, 2011).

### **1.1.2 Firm Profitability**

Hermanson (1989) defines profitability as the organizations' capacity to create income while its incapability to create income is a loss. The key measures of profitability are the gross profit margin, net profit margin, return on total assets and return on common stockholders' equity. Profitability growth improvement is paramount for firms, especially manufacturing firms; it assists the firms to ensure their sustainability as going concerns, stakeholder returns are also safeguarded and enhanced, and so on.

Gross profit margin is defined as every dollar of sales left over after paying the cost of goods sold. An organization ought to compare its gross margin to that of the industry because a gross margin higher than industry means the organization is financially healthy. Net profit margin is the percentage of sales net of all costs incurred during production and distribution have been deducted. The net profit margin helps gauge the overall success of an organization. A high net profit margin means that an organization takes time to calculate the cost of production before setting the prices and it is also exercising good cost control. An organization should also compare its results with organizations within the same industry, because they are all subject to the same external environment and customer base, and the cost structures may be the same.

Return on total assets (ROA) which is calculated by comparing net income to the average total assets is used to assess the net income that is generated by the total assets of an organization over a certain period of time. It measures how efficiently a company is using its assets to generate profits for a particular financial period. Return on equity measures an organization's profitability. This in turn reveals the profit an organization generates

with the resources invested by the shareholders. If the return is high it means that the organization is investing the shareholders investment in profitable ventures which means that the value of ownership in the organization is increased.

### **1.1.3 Effect of Product Innovation on Profitability**

Product innovation results into improved competitive products and services rolled out; a firm's market share might improve also, thereby enhancing profitability. The disruptive innovation theory (Christensen, 1997) posits that a new market and value proposition is the result of product innovation; as such a firm deploying a disruptive product innovation shall enjoy improved profitability. Organizations that use offensive strategies in introduction of new products have a very high probability of succeeding in introducing new products and in turn achieve high levels of profitability (Dwyer and Mellor, 1993).

Product innovation can actually improve an organizations performance in numerous ways. Innovation has a significant impact on an organizations performance in the sense that it improves its market position hence giving the organization competitive advantage and as a result superior performance (Walker, 2004). There is a positive relationship between innovation and profitability, size, market share and growth rate (Deshpande et al., 1993). Baldwin and Johnson (1996) hold that product innovation significantly affects a broad range of an organization's performance measures which are, the market share gain and return on investment. Innovators earn higher profits compared to non-innovators because of, improved capabilities (Geroski & Machin, 1992).

#### **1.1.4 Private Manufacturing Firms in Nairobi County**

Manufacturing industries refers to industries concerned with manufacturing and processing of goods, and are involved in the making of new goods or in value addition to existing goods. The final products can either be sold as finished product or be used as an intermediate product for further processing of other products (Lawrence & Chad, 2012).

#### **1.2 Research Problem**

Product innovation is essential to sustainable competitive edge of all businesses, among them manufacturing companies. Innovation is a key driver of growth, in terms of market share and business performance (Sharma, 2009). Diffusion theory postulates that product innovations result over time from how the innovations are communicated among the participants (Rogers, 1962); returns from product innovations trickle over a product lifecycle. However, according to disruptive innovation theory (Christensen, 1997) product innovation creates totally new markets and value propositions thus displacing established market leaders, products and alliances; as a result a firm deploying a disruptive innovation shall enjoy improved profitability, more so in the short term.

The manufacturing sector has a huge ability to promote financial development and competitiveness in Kenya. The manufacturing industry is the third leading sector contributing to gross domestic product in Kenya. The sector has had fluctuations in their financial performance over the year, registering varying profit levels. The manufacturing firms have also been undertaking research and development activities over the years; the result being innovative product rollout (KNBS, 2016)



When a new product is introduced to the market, it faces limited direct competition therefore allowing firms to enjoy relatively high profits. A positive relationship therefore exists between product innovation and firm profitability (Schumpeter, 1934). Over a period of time, as high returns experienced by an organization may erode because of imitation and increased competition. However, organizations that introduce new products often achieve high profitability levels for a long period (Sharma and Lacey, 2004. (Varis and Littunen, 2010). Geroski et al. (1993) found that there is a positive relationship between innovation and the operating profit margins.

Han et al. (1998) found that firm's organizational and technological innovativeness had positive impact on an organization's performance. Roberts (1999) in a study in the United States found evidence that supported the relationship between product innovation and sustained superior profitability. Calantone et al. (2002) in their study revealed that firm innovativeness is positively related to firm profitability. Cho & Pucik (2005) found that innovativeness acts as a mediator between quality and growth. Quality on the other hand mediates innovativeness and profitability. Artz et al. (2010) found product innovation has a significant impact on firm performance.

The review of the previous studies gives us a clear link between the product innovation and profitability. Product innovation has a significant positive effect in firms' profitability (Calantone et al., 2002; Cho & Pucik, 2005; Varis and Littunen, 2010). However no study has looked at the effect of product innovation on profitability of private manufacturing firms in Nairobi County. The proposed research study shall seek to

fill this gap by answering the research question: What is the effect of product innovation on profitability of private manufacturing companies in Nairobi County?

### **1.3 Research Objectives**

The objective of this study was to determine the effect of product innovation on the profitability of private manufacturing companies in Nairobi county.

### **1.4 Value of the Study**

This study will shed light on the nature and importance of product innovation. It will, thus, assist in focusing research attention to the key issues which determine the profitability of organizations. The study is important as a catalyst to explore the area further. It would also facilitate the conduct of other studies that require the results of their study on their information. Students and academicians who wish to carry out further research in product innovation and performance in organizations. This study will provide pertinent information for policymaking and planning in the industry. Policymakers will hence, be able to make informed strategic decisions in the light of increased competition, environmental pressures and awareness.

Management is responsible for the day to day running of the company. The innovation issues may affect the action of managing either positively or negatively. The management of the manufacturing firms in Nairobi County will use this information when making strategic decisions towards the customers in their companies. The study will be of benefit to manufacturing firms, as they will understand how product innovations or lack of it affect organization's profitability it will help in strategy formulation decisions and

resource allocation towards product research and development. The research will highlight challenges arising from product innovation as a business strategy and ways of overcoming them. The findings that will be gathered from the study will help manufacturing firms re-engineer their strategies on product innovation.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

This chapter covers the literature review relevant to the proposed research study. It presents and discusses the theoretical review, other determinants of manufacturing firms' profitability, as well as empirical review, and ends with a summary.

### **2.2 Theoretical Review**

This section covers the theoretical review. The main theories relevant to the proposed study are presented and discussed. These theories are: Diffusion of Innovation Theory and Disruptive Innovation Theory.

#### **2.2.1 Diffusion of Innovation Theory**

Diffusion theory (Rogers, 1962) details how innovations spread, through market or non-market channels or within an organization. The theory therefore explains how, why, and at what rate new ideas and technology spread. The theory posits that diffusion is the process a new product is communicated to the participants of a particular market set up. The factors that affect the spread of a new idea are the innovation, modes of communication the time and the market in which the product is introduced.

Diffusion manifests itself in different thus affecting product innovation as well as the time taken to adopt the new product either in the organization or by the market (Rogers, 1962). Diffusion of innovation theory also asserts that product innovations are not adopted by all individuals at the same time. When a new product is introduced into the market the organization's sales and marketing department is actively involved in

marketing the new product and convincing the customers on why they should buy the new products. This therefore means that customers tend to adopt a new product in a time sequence (customers will adopt the new product at different times) this therefore implies that effect on profitability shall be spread over a period of time. Profits will accrue to the company in the long run rather than in the short run.

### **2.2.2 Disruptive Innovation Theory**

Christensen (1997) defines disruptive innovation as an innovation which when introduced in the market creates a new network eventually displacing products and firms that have been established over a period of time. This means that disruptive product innovations emanate from outsiders rather than already market leading firms in place. However, disruptive product innovation may take longer to develop other forms of innovations, but once the product is introduced in the market, it penetrates faster and hence a higher degree of impact in established markets.

Sustaining innovations are normally pursued at the higher tiers of their markets where most customers will equate the price of a commodity to its quality. Organizations achieve greatest profitability by charging the highest prices to their high class customers (Christensen, 1997). In their initial stages disruptive businesses are characterized by lower profits and smaller markets. The new products introduced in the market may not appear as attractive as existing products.

### **2.3. Determinants of Profitability**

Profitability of private manufacturing firms is influenced by product innovation by the said firms or a lack thereof. However there are other determinants that are theoretically

expected to influence profitability. These determinants are: Cost of production, Inflation rates, tax regime and size of the company, among others.

### **2.3.1 Cost of Production**

McGlaphren (2003) defines cost of production as expenses that a company incurs during the production process. An organization that has the ability to maintain their production costs at a bare minimum will enjoy high profit levels because, the lower the production cost, the higher the profit. An organization must work on keeping their costs as low as possible but at the same time not compromising with the quality of the products manufactured. The variable costs of production e.g raw materials and labor are what the organization should work on reducing because their increase or decrease directly affects the profit of the organization. Fixed costs have no effect on maximizing profits or price they are therefore referred to as sunk costs.

### **2.3.2 Inflation Rates**

Inflation can be defined as an increase in the cost of living resulting from rise in price levels of prices of goods and services in the market over a period of time. The purchasing power of one unit of currency goes down when the price of goods and services goes up. This therefore means that the purchasing power of a certain amount of money is reduced with inflation over a period of time. (Smith & Anderson, 1996).

(Davidson & Weil, 1995) states that a low inflation rate is economically beneficial to a country but a negative inflation is not. On the other hand, a high inflation rate is harmful because it distorts consumer behavior. People tend to purchase their requirements in advance because of fear that prices will increase. When people buy in advance for fear

that prices will increase, it means that there will be a shortage that will be created in the market. High inflation affects the fixed income earners and those without bargaining power because their purchasing power falls. (Packer, 1997).

When inflation is high, organizations are not able to calculate prices accurately and the returns from investments due to the wide fluctuations in the inflation rate and this leads to undermined business confidence. Inflation also makes the exports of a country less attractive compared to the other countries. The value of goods sold locally or those exported will be fewer and that will create a larger trade deficit. This therefore means that, high inflation in a country will in turn weaken its competitive position in the international market (Davidson & Weil, 1995).

### **2.3.3 Tax Regime.**

When organizations need to make firm-level decisions about investment profit taxation becomes much more relevant compared to trade liberalization. When changes in profit tax instruments are uniform the result is a heterogeneous response of effective tax rates and, after-tax profits at the firm level. If firms have similar profit margins, then they would require pretax profits to differ as well. (Downs and Tehranian, 1988). Dividends attract a higher tax rate compared to capital gains therefore companies paying dividends will lower shareholders value because shareholders will be required to pay taxes on the dividends (Collins & Kemsley 2000; Poterba, 2001).

### **2.3.4. Size of the Company**

The size of a firm is defined as the quantity and diversity of production capability a firm possesses. It can also be defined as the amount and variety of goods a firm can produce in

line with its customers' needs. The size of the firm is key in determining profitability because bigger firms can produce goods at a much lower cost compared to smaller firms hence they enjoy economies of scale. Larger firms however are usually controlled by managers who may pursue self-interested goals instead of pursuing the interests of the organization and this means that the profit maximization objective of the firm is substituted by the managerial utility maximization function hence bringing in the issue of conflict of interest. (Amaton & Burson, 2007).

#### **2.4. Empirical Review**

This part investigates past studies covered in relation to this topic of study. These will cut across various economies with the view of comparing these previous studies and identify the areas which need further studies.

Vareska, Jeroen & Rochemont (2009) undertook a research study to investigate the effect of open innovation on SME's. The study was undertaken in Netherlands over a seven-year focus period. Secondary data was obtained from 605 such firms. The census study analyzed the data collected using content analysis. The research study observes that the study elements engage in open innovation practices over the study period. The study also finds no major differences between services and manufacturing industries. From the study, it was found that medium sized firms engage more in open innovation than the smaller firms.

Love & Roper (2009) undertook a research study to investigate the effect of innovation ownership on profitability using descriptive design. The research study used secondary data. The secondary data was obtained from financial statements over a period of 6 years. The data was analyzed using regression analysis and the conclusion of the study was that



product innovation in itself has no effect on the profitability of a firm since there are other factors that affect the same in the manufacturing set up.

Youtie & Roper (2008) undertook a study on impact of product and process innovation on profitability of manufacturing firms in Georgia, United States of Africa using a survey research design. The study used questionnaires to collect the primary data used. The total population studied consisted 653 firms out of which a sample of 110 firms was selected. The conclusion of the study was that product innovation matters most for the most profitable manufacturing establishments while process innovation is more widespread among firms with more modest levels of profitability.

Corsino (2008) also undertook a research study to investigate the effect of product innovation on firm growth in London. The study used a descriptive research design and secondary data obtained from the said organizations covering a period of 7 years. The population consisted of 524 firms out of which a sample of 45 firms were obtained. Data was analysed using regression analysis. The conclusion of the research study was that incremental innovation increases performance of producers and affects the firm's ability to sustain its market position.

Mugo (2015) undertook a study with an objective to investigate the relationship between innovations and performance of Kenya's wine industry using a descriptive research design. The study collected primary data using questionnaires. The population of the census study consisted of five main wine companies in Kenya. Descriptive statistics and a suitable regression model was used to do the data analysis. The research study found that

innovations are indispensable to companies' future growth and sustainability. Wine companies with serious innovations, improved their profitability. The study concludes that innovations helps an organization in obtaining a clear direction as regards innovation and therefore the efforts of the entire organization are directed to a common innovation goal and this positively impacts on their performance.

Mugalisi (2015) also undertook a study with the objective to establish the effect of Research and Development on the performance of manufacturing companies listed at the Nairobi Securities Exchange. Descriptive research design was used and secondary data from published financial statements from year 2010 to 2014 was used. The target population was 17 manufacturing companies listed at the Nairobi Securities Exchange. The researcher used regression analysis and descriptive statistics to analyze the data collected from the study. The study found out those firms relies on technology to identify opportunities that help exploit innovative products and services. This means that firms are forced to invest in research and development (R&D). The study findings show that R&D significantly put strain on the financial performances in the short run whereas in the long run, the firm realizes the investment returns through strategies recommended from the R&D thus improved financial performance of the firm.

Wasike (2014) conducted a case study of Haco tiger brands east Africa on effect of product innovation on performance. Data analysis was done using longitudinal study design and secondary data was collected from annual financial sales report for the year 2009 to 2014. Data was then analyzed using trend analysis. The research study found that product innovation was relevant to the company as it contributed significantly to the sales

growth of the company and helped to accelerate total company sales revenue. Product innovation thus influenced the performance of Haco Tiger Brands positively.

Oirere (2015) conducted a study on the effect of innovation on financial performance of small and medium sized manufacturing enterprises in Nairobi County. Primary data was collected using questionnaires and descriptive research design was used to analyze the data and make conclusions. The target population was 3,582 companies and a sample of 83 firms was selected using simple random sampling. Data was analyzed using regression analysis. The study concluded that innovation has positive effects on financial performance; innovation increases profits for a company; innovation increases the company's market share, it also increases savings for the company and reduces operating cost of the small and medium manufacturing enterprises.

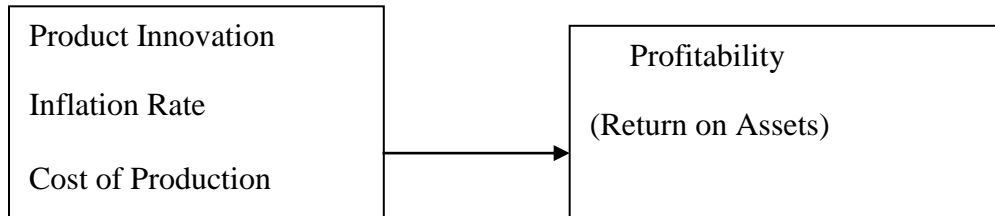
Njogu (2014) undertook a similar research study aimed at investigating the effect of innovation on financial performance of small and medium enterprises in Nairobi County, Kenya. The study used a descriptive research design and obtained primary data using questionnaires. The population comprised 1050 firms and a sample of 200 firms was obtained using stratified random sampling. Data obtained was analyzed using descriptive statistics and regression analysis. The study also finds that there is a positive significant relationship between process innovation and financial performance of SMEs in Nairobi County.

## 2.5 Conceptual Framework

**Figure 2.1: Conceptual Framework**

### Independent Variables

### Dependent Variable



**Source: Author (2016)**

## 2.6. Summary of Literature Review

This chapter has discussed the relevant literature review that guides the proposed research study. Theoretical review has been discussed in detail; Diffusion of Innovation and Disruptive Innovation theories have been covered. Other determinants of profitability of manufacturing firms have also been presented and discussed. Foreign and local relevant empirical studies have also been reviewed. The chapter ends with a conceptual framework and a summary.

From the empirical studies reviewed, product innovation has a positive influence on firm performance (Oirere, 2015; Mugo, 2015; Mugalisi, 2015; Youtie & Roper, 2008). However no study has been undertaken to investigate the effect of product innovation on profitability of manufacturing firms in Nairobi County. The proposed study shall seek to fill this gap.

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

This chapter outlines the broad research method to be used to carry out the proposed study. This chapter shall seek to outline the target population, research design, sampling design, data collection method and instruments, and data analysis.

### **3.2 Research Design**

Research design is defined as the structure of study used in order to get feedback to research questions. (Robson,2002). Descriptive survey was used to study the research problem. Descriptive research depicts persons involved in a study in accurate way (Saunders, Lewis and Thornhill, 2003). Descriptive research design was used for this study because it was possible to collect data from a sizable population in an economic and effective way. (Mugo, 2015) also used a descriptive design in a similar research study.

### **3.3 Population of the Study**

Population refers to the complete collection of sets of elements about which a researcher wishes to make conclusions about. A population element is the area under discussion like an organization or a person whose the measurement is being taken (Cooper & Schindler, 2003). The target population in this study comprised all private manufacturing firms in Nairobi County. There are 378 manufacturing firms registered with the Kenya Association of Manufacturers (KAM, 2016); these shall form the population of the study.

### **3.4 Sampling Design**

Sampling means selection of individuals that will be involved in a study such that those selected to represent the larger population (Mugenda and Mugenda 1999). According to (Cooper and Schindler, 2003) the sample size should be a function of both the estimation accuracy needed by the researcher and the variation in the population parameters under study. A sample of 45 manufacturing firms was used in the study. The sample size used in the study was obtained using convenience random sampling (see Appendix II); Oirere (2015) also used this sampling method while undertaking a similar research study.

### **3.5 Data Collection**

Primary data was used in the study. The data was collected using questionnaires which had both open ended or closed questions and had two parts. The questionnaires were administered using the drop and pick method by the researcher. The questionnaires were pre-administered to test its reliability and validity and apt corrections made based on this pre-administration.

### **3.6 Data Analysis**

The data collected was first edited, sorted and coded using numerical numbers and presented in form of tables and graphs. Descriptive statistics such as median, mean, and standard deviation was used to describe and make analysis on the data. Measures of association was used to examine the relationship between the predictor and dependent variables. Regression analysis was undertaken to establish the effect of product innovation on profitability of manufacturing firms in Nairobi County using a

suitable regression model. The specific analytical model is specified in the succeeding section.

### 3.6.1 Analytical Model

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Where:

**Y = Profitability** measured by Return on Assets ratio (ROA= Net Income/Total Assets) covering the period 2012 to 2015;

**X<sub>1</sub> = Product Innovation** measured by the number of new products rolled out in a year.

**X<sub>2</sub> = Inflation Rate** measured by annual consumer price index.

**X<sub>3</sub> = Cost of Production** measured by total cost of production incurred by a firm in a year.

**β<sub>i</sub> = beta coefficients** for the respective independent variable X<sub>i</sub> ; indicating the change in the dependent variable following a unit change in the respective independent variable.

**β<sub>0</sub>** = this being the value of the dependent variable (profitability) when the independent variable are at zero.

**ε = error term.**

### 3.6.2 Tests of Significance

T-tests were undertaken at 95% significance level to test the level of statistical significance of the study variables. F-test shall be undertaken to test the significance of the model. A significance level is a critical likelihood linked with a statistical hypothesis

test that shows how likely it is that an inference supporting a transformation between a perceived value and some arithmetic anticipation is correct (Zikmund et al., 2010).



## **CHAPTER FOUR:**

### **DATA ANALYSIS, PRESENTATION AND INTERPRETATION**

#### **4.1 Introduction**

This chapter presents the results of the data analysis on the study to determine the effect of product innovation on the profitability of private manufacturing companies. The study was carried out in 45 private manufacturing companies which were selected using convenience random sampling which was approximately 11.9% of all the private manufacturing firms in Nairobi County. There are 378 manufacturing firms registered with the Kenya Association of Manufacturers. The findings are based on these responses as presented in this chapter. First, the sample characteristics are shown. This is followed by a presentation of the results based on the study objectives.

#### **4.2 Response rate**

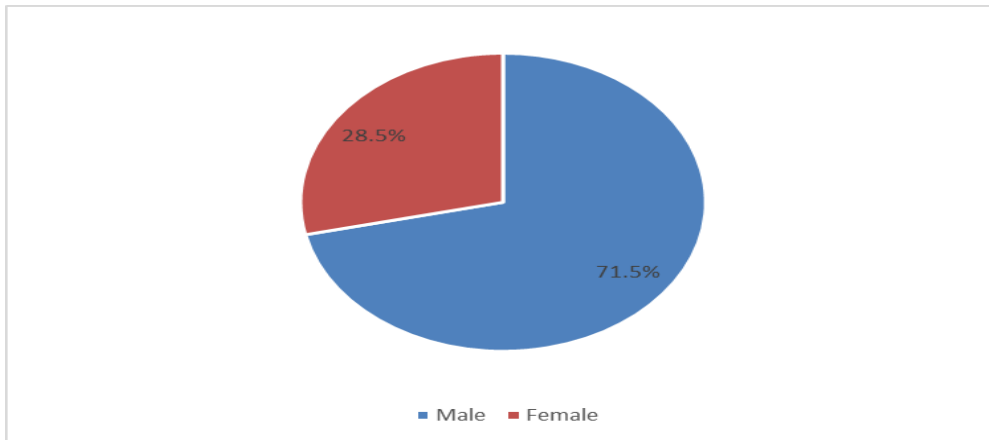
A total of 45 questionnaires were sent, filled and picked. Thirty two questionnaires were filled therefore representing a 71.11% response rate.

#### **4.3 Demographic information**

##### **4.3.1 Respondents gender.**

The study found that 71.5% of the respondents were male while the remaining 28.5% were females. This indicates that majority of those that responded were male. The results are summarized and presented in Figure 4.2.

#### **Figure 4.1 Gender**



**Source: Research data (2016)**

#### **4.3.2 Respondents Position in the Organization.**

Majority of the respondents were management accountants recording a high percentage of 34.38%. Another 15.63% of the respondents were sales-managers while a similar portion were factory managers. They were followed by warranty administrators whose respondents were 9.38%. Production Managers, Accountants and general managers at 6.25% each and the least respondents were plant managers and supervisors with 3.13%. Results are well illustrated in Table 4.1.

**Table 4.1 Frequency Distribution by Position Held**

<b>Position</b>	<b>Frequency</b>	<b>Percentage</b>	<b>Cumulative Percentage</b>
<b>Factory Manager</b>	5	15.63	15.63
<b>Management Accountant</b>	11	34.38	50.00
<b>Production Manager</b>	2	6.25	56.25
<b>Sales-Manager</b>	5	15.63	71.88
<b>Accountant</b>	2	6.25	78.13
<b>Plant Manager</b>	1	3.13	81.25
<b>General Manager</b>	2	6.25	87.50
<b>Warranty Admin</b>	3	9.38	96.88
<b>Supervisor</b>	1	3.13	100.00

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**Source: Research data (2016)**

### 4.3.3 Years of Experience

The study further revealed that 34.38% of the respondents have worked in the industry for between 1 to 5 years, 31.25% have worked in the industry for 6 to 10 years, 28.13% of the respondents have worked in the industry for over 10 years and the remaining 6.25% have worked in the industry for less than 1 year. These results are summarized and presented in Table 4.2.

**Table 4.2. Frequency Distribution of Years of Experience**

<b>Years worked</b>	<b>Frequency</b>	<b>Percentage</b>	<b>Cumulative Percentage</b>
<b>Less than a year</b>	2	6.25	6.25
<b>1-5 years</b>	11	34.38	40.63
<b>6 – 10 years</b>	10	31.25	71.88
<b>Over 10 years</b>	9	28.13	100.00
<b>TOTAL</b>	<b>32</b>	<b>100</b>	

**Source: Research data (2016)**

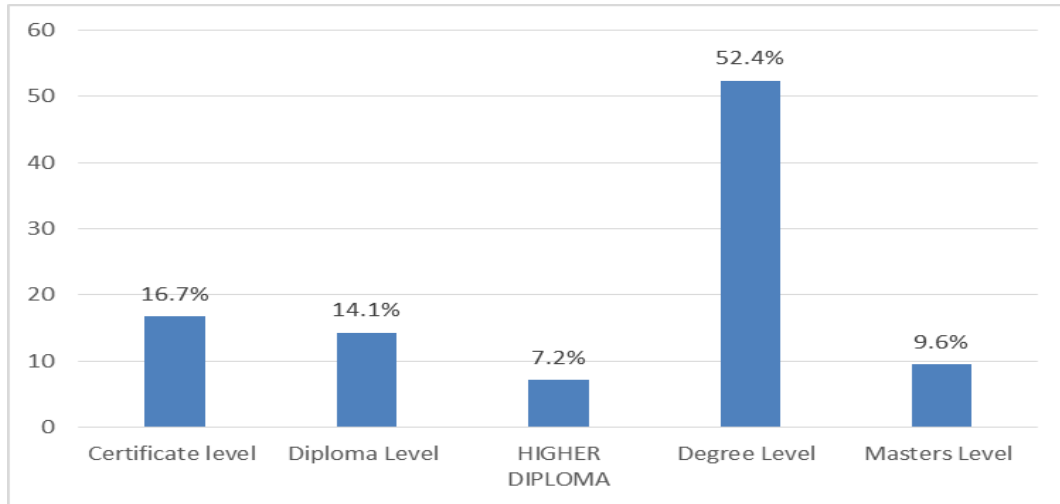
This shows that most of the respondents had more than 1 year of experience in the industry. The length of time the respondents have been working in the industry has a great impact on the responses they provide as they have a better understanding of the industry.

### 4.3.4 Respondents Education Level

As regards the respondents' education level, the study revealed that 52.4% of the respondents had bachelors' degrees as the highest level of education, 16.7% of the respondents had certificates, 14.1% of the respondents had diplomas, 9.6% of the respondents had masters' degrees while the remaining 7.2% of the respondents had

higher diplomas. These results are summarized and presented in figure 4.3.

**Figure 4.2: Respondents Education**



**Source: Research data (2016)**

The educational background points to the fact that most of the respondents are properly educated and thus easily understood the issues raised in the questionnaire concerning the area of study. Given the level of education the respondents also clearly understood the ethics of research and thus were expected to give honest and informative responses which would add to the credibility of the final research findings and report

## **4.4 Product Innovation**

### **4.4.1 Number of new products innovated since 2012**

The study further found that since 2012 the respondent companies had innovated 78 new products. Of this, 21.79% new products were introduced in 2012, 26.92% were introduced in the year 2013 while 16.67% new products were introduced in 2014 and lastly 34.62% of the new products were introduced in 2015. These results are summarized and presented in Table 4.3.

**Table 4.3. Frequency distribution by number of new products**

<b>Year</b>	<b>Number of New Products</b>	<b>Percentage</b>	<b>cumulative percentage</b>
2015	27	34.62	34.62
2014	13	16.67	51.28
2013	21	26.92	78.21
2012	17	21.79	100.00
	78	100	

**Source: Research data (2016)**

Majority of the new products were introduced in the year 2015 when innovation became famous as a way to compete and acquire competitive advantage.

#### **4.4.2 Number of Products Redesigned Since 2012**

The study further found that since 2012 the respondent companies had redesigned 88 products. Out of the 88 products, 18.18% of the products were redesigned in 2012, 23.86% of the products were redesigned in the year 2013 while 21.59% of the products were redesigned in 2014 and lastly 36.36% of the products were redesigned in 2015.

These results are summarized and presented in Table 4.4.

**Table 4.4. Frequency distribution by number of products redesigned**

<b>Year</b>	<b>Number of New Products</b>	<b>Percentage</b>	<b>Cumulative percentage</b>
<b>2015</b>	32	36.36	17.02
<b>2014</b>	19	21.59	38.60
<b>2013</b>	21	23.86	56.23
<b>2012</b>	16	18.18	100.00
	88	100	

**Source: Research data (2016)**

#### 4.5 Descriptive statistics

Table 4.5 presents the descriptive analysis results of the variables of the study. The data collected on the performance of the sector (measured in ROA) and the independent variables (Product Innovation, rate of inflation and cost of production) was analyzed to give the mean values for the entire period under study as well as their standard deviations.

**Table 4.5: Descriptive Statistics of the Study Variables**

<b>Variables</b>	<b>Mean(<math>\mu</math>)</b>	<b>Std. Deviation(<math>\sigma</math>)</b>	<b>N</b>
ROA	2.868613	2.355339	32
Product innovation	16.35714	1.46923	32
Inflation rate	14.4935	11.401923	32
Cost of production	4.115667	1.7173726	32

According to the study results in Table 4.1, the average ROA (financial Performance) of the manufacturing firms in Nairobi for the period (2012-2015). The result illustrates that the average return on assets was 2.8686 with stand deviation of 2.355339. This implies that one unit of total assets invested by the manufacturing companies generated a net income of 2.868 units on average during the study period. The mean number of production innovations was 16.357 with a standard deviation of 1.46923. Average mean inflation stood at 14.4935 with a standard deviation of 11.4019. Cost production registered a mean of 4.115% with standard deviation of 1.17137. Thus, these values can be relied as representatives of the performance of the manufacturing firms in Nairobi.

## **4.6 Inferential statistics**

The inferential statistics involved the use of correlation analysis, which shows the relationship between the predictor and dependent variables and multiple linear regression analysis. The regression analysis was done using Linear Least Squares method.

### **4.6.1 Correlation analysis**

Bi-variate correlations were calculated using the Pearson r statistic in this study. Values between - 0.7 and -1.0 (0.7 and 1.0) indicate a strong negative (positive) linear correlation. Values between -0.5 and -0.7 (0.5 and 0.7) imply a moderate negative (positive) linear association. Values between -0.3 and -0.5 (0.3 and 0.5) a weak negative (positive) linear association while values between 0 and 0.3 (0 and -0.3) indicate no correlation (variables not associated). The significance of the relationship is tested at 95% confidence level using a 2-tailed test where a statistically significant positive correlation is indicated by a probability value of less than  $\alpha < 0.025$ . This implies that the probability of obtaining such a correlation coefficient is less than 0.025, hence indicating the presence of an association between the variables. The correlation analysis results are presented in Table 4.6.

**Table 4. 6: Correlation Results**

		Product innovation	Inflation rate	Cost of production	ROA
Product innovation	Pearson correlation	1	.054	.188	.199
	Sig.(2 tailed)	*	.733	.227	.102
Inflation rate	Pearson correlation	.733	1	.011	-.340
	Sig.(2 tailed)	.054	*	.904	.206
Cost of production	Pearson correlation	.188	0.11	1	-.367
	Sig.(2 tailed)	.277	.904	*	.016
ROA	Pearson correlation	.199		-.367	1
	Sig.(2 tailed)	.602	.206	.016	*

**Source: Resource data (2016)**

Results in Table 4.7 reveal that the correlation between product innovation and ROA of (0.602) is positive and significant. This implies that an increase in product innovation is associated with an increase in ROA. The findings also reveal that the correlation between inflation rate and ROA of (-0.34) is negative and significant. This implies that an increase in inflation rate is associated with a decrease in ROA. Cost of production was also found to be negatively and significantly associated with ROA (-0.367) implying that an increase in Cost of production is associated with a decrease in ROA.

#### **4.6.2 Regression analysis**

The objective of this study was to determine the effect of product innovation on the profitability. To accomplish this, the study conducted a regression analysis which gives



the relationship between the independent variables used in the study including the product innovation, inflation rate, cost of production and the performance manufacturing firms (measured by the ROA). The data used was collected for 4 years thus giving a 4 year period data which facilitated linear regression analysis. The regression results are presented in tables 4.7 and 4.8 below.

#### 4.6.2.1 Regression Model summary

The regression model results are shown on Table 4.7. The table represents the correlation measurement of the dependent and the predictor variables in the model. The R squared represents the coefficient of determination, which measures the proportion of variance in the dependent variables that is determined by the predictor variables. The Adjusted R square is a modified measure of the coefficient of determination, that has been adjusted to include the number of variables in the model and hence measures the reliability of the model.

**Table 4.7 Regression Model summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.774 <sup>a</sup>	.749	.709	.04384

a. Predictors: (Constant), x1, x2, x3

#### Source: Research data (2016)

The findings show that *R* which is the multiple correlation coefficients that shows quality of the prediction of the dependent variable by the independent variable is 0.774. This is a good indication since it points to a strong correlation. The *R-Square* measure shows that all the three independent variables in the model explain 74.9% of profitability of manufacturing firms. Consequently from the Adjusted R-Squared it is apparent to note

that after modifying the model for inadequacy the independent variables can explain 70.9% of profitability of manufacturing firms.

#### 4.6.2.2 Regression coefficients

The regression coefficients were calculated in order to show the relationship between profitability and the independent variables. These have been presented in table 4.8 below.

These measure the effect of each independent variable (product innovation, Inflation rate and cost of production) to profitability (dependent variable) and how an increase or decrease in each of these independent variables would affect profitability.

**Table 4.8 Coefficients (a)**

Model	Standardized Coefficients	T	Sig.
	Beta		
Constant ( $\beta_0$ )	0.0125		
Product innovation( $X_1$ )	.954	4.0241	0.0001
Inflation rate( $X_2$ )	-.049	-4.4511	0
Cost of production( $X_3$ )	-.743	-4.258	0

a. Dependent Variable: ROA

The above coefficients are used to answer the regression model below;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Where:

Y= performance was measured using return on assets (ROA) which is was calculated as net income divided by total Assets

$\beta_0$ =Constant or the Value of Y when the independent variables are zero.

$X_1$ = product innovation, number of new products

$X_2$ = Consumer Price Index to represent inflation Rate

$X_3$ = cost of production.

Substituting the above coefficients the regression model looks as follows;

$$Y (\text{ROA}) = 0.0125 + 0.954X_1 - 0.049X_2 - 0.743X_3 + \varepsilon$$

Table 4.8 above portray that holding all the explanatory variables constant, private manufacturing companies will realize an average of 0.0125 units in profitability. Product innovation has a positive coefficient of 0.954 implying that Product innovation positively affect profitability of private manufacturing companies. Inflation has a negative coefficient of  $- 0.049$  implying that inflation negatively affects profitability of private manufacturing companies. Cost of production has a negative coefficient of  $- 0.743$  implying that cost of production negatively profitability of private manufacturing companies.

#### **4.6.2.3 Significance level**

Analysis of the variance (ANOVA) was used to compare the various means in order to establish whether or not a significant relationship exists between dependent and independent variables. ANOVA indicates a significant F statistics implying that the model was fit for the estimation.

Table 4.9 below gives the ANOVA results which help the researcher in evaluating the reliability of the model. A 2-tailed test was used to test significance of the model at 95% confidence interval.

**Table 4.9 ANOVA (b) table**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.268	2	.08934	3.328	.015(a)
	Residual	.026	1	.026		
	Total	.138	4			

a. Predictors: (Constant), product innovation, Inflation, cost

b. Dependent Variable: ROA

The F-distribution was used to obtain an F-statistic (3.328) at F (2/29) I.e 2 and 29 degrees of freedom. The critical value at 5% level is  $\alpha=0.025$  under a 2-tailed test. This implies that the chance of obtaining an F statistic greater than or equal to 3.328 is 0.015, which is less than  $\alpha=0.025$ . The variations in the model results are insignificant implying that there would be little difference if the study population was changed. From the F-statistic, the regression model used is significant for the study and can be used to explain the effect of product innovation on profitability of private manufacturing companies.

#### **4.7 Challenges of product innovation**

Majority of the respondents said the main challenge facing private manufacturing companies related to innovation is unpredictable business environment limited. Others saw increased cost of production, severe competition and convincing customers to buy new products rolled out in the market as a major challenge facing manufacturing firms.

Respondents also agreed that limited information on new technology advancements, financial issues limit implementation of innovations, and limited experience and skills using new machines are the main challenges facing the manufacturing companies.

## **CHAPTER FIVE : SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

### **5.1 Introduction**

The chapter outlines the summary of findings, conclusions of the study, limitations experienced while undertaking the study and the recommendations for policy, practice and suggestions for further study.

### **5.2 Summary of Findings**

The main objective of this study was to determine the effect of product innovation on the profitability of private manufacturing companies. The study was carried out in 45 private manufacturing companies which were selected using convenience random sampling which was approximately 11.9% of all the private manufacturing firms in Nairobi County.

A total of 45 questionnaires were sent, filled and picked. A total of 32 questionnaires were filled therefore representing a 71.11% response rate. The study found that 71.5% of the respondents were male while the remaining 28.5% were females. Majority of the respondents were management accountants recording a high percentage of 33.3%. 21.42% of the respondents were sales-managers. 14.28% of the respondents were factory managers followed by warranty administrators whose respondents were 11.9%. The study further revealed that 33.33% of the respondents have worked in the industry for up to 1 to 5 years, 30.95% have worked in the industry for 6 to 10 years, 26.19% of the respondents have worked in the industry for over 10 years. Study found that 52.4% of the respondents had bachelors' degrees as the highest level of education, 16.7% of the

respondents had certificates, 14.1% of the respondents had diplomas, 9.6% of the respondents had masters' degrees.

The demographic background points to the fact that most of the respondents easily understood the issues raised in the questionnaire concerning the area of study and also clearly understood the ethics of research and thus were expected to give honest and informative responses which would add to the credibility of the final research findings and report.

The study further revealed a positive, significant correlation between product innovation and ROA. The findings also revealed that the correlation between inflation rate and ROA is negative and significant. Cost of production was also found to be negatively and significantly associated with ROA.

### **5.3 Conclusion**

The study concluded that product innovation has positive effects on financial performance. As evident from this study, product innovation increased profits for the companies. Hence, manufacturing companies should invest more on product innovation practices as it improves financial performance. In general product innovation has a significant effect on the profitability of private manufacturing firms which in turn leads to the organization gaining a competitive edge against their competitors. The results of this study agree with the findings of (Walker, 2004); and (Mwangi, 2013) who in their studies found a positive relationship between product innovation and financial performance.

#### **5.4 Limitations of the Study**

The major limitation encountered by the researcher was that some organizations were not willing to share information as regards their performance based on the fact that these are private companies and this information should not be accessible by the public for fear of passing the information to their competitors. This is so because the financial performance of these private companies is not made public like that of the companies listed at the Nairobi Securities Exchange. The other limiting factor is that it was time consuming walking from one private company to the other bearing in mind that they are not all located in the same area.

#### **5.5 Recommendations**

Based on the findings, the study recommends that manufacturing companies should adopt innovation as it increases financial performance. For businesses to realize growth, investment in technology should be made in order to reduce costs and increase the level of sales. Manufacturing companies also need to keep designing and redesigning their products to meet changing user needs and product innovation is very crucial in the achievement of this goal. It is also vital for businesses to take product innovation to raise the level of quality of the products they produce as this research has revealed that product innovation can greatly enhance the production of quality products which would in the end raise the level of sales and increase the profit margins of the business.

#### **5.6 Suggestions for Further Study**

The study suggests that further study should be done considering all counties. This study only focused on companies in Nairobi Country hence further study on effects of product

innovation on financial performance need to be done in the other Counties. Due to the limited time that the study had, the study used a small sample as compared to the total number of companies in Nairobi County. The study hence proposes that further study be carried out using a large sample size.

The researcher also suggests that further study be conducted to identify the effects of innovation on financial performance of other industries since the study only focused on manufacturing companies in Nairobi County.



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## APPENDICES

### APPENDIX 1: QUESTIONNAIRE

**Dear Respondent,**

I am Emma Murugi Njagi, a student at the school of Business, University of Nairobi, undertaking a research study titled “The Effect of Product Innovation on Profitability of Manufacturing Firms in Nairobi County” as part of my academic work requirements.

Kindly spare your time and respond to the questionnaire below. The information that you will provide shall be treated with a high level of confidentiality and strictly used for the stated academic purpose only.

Yours Faithfully,  
Emma M Njagi.

#### **Part A: General Information**

Please respond to the following questions below by ticking [] on the appropriate option.

1. Please indicate your gender.      Male []      Female []

2. Please indicate your position:

Factory Manager      []      Management Accountant      []

Production Manager      []      Sales-Manager []

Others (specify) .....

3. Indicate your length of service in the organization:

Less than a year []      1 - 5 years []      5 - 10 years []      over 10 years []

4. Kindly indicate your academic qualification:

Certificate level []      Diploma Level []      Degree Level []

Masters Level []      Others.....

**Part B: Product Innovation**

5). Indicate below the number of new products rolled out by your organization in the past four years:

<b>Year</b>	<b>Number of New Products</b>
2015	
2014	
2013	
2012	

6). Indicate the number of products that have been re-designed over the past few years.

<b>Year</b>	<b>Number</b>
<b>2015</b>	
<b>2014</b>	
<b>2013</b>	
<b>2012</b>	

7). What are the challenges, if any, your firm has faced while undertaking product innovations?

.....

.....

.....

.....

8). Kindly provide us with your cost of production amounts over the past few years

below:

<b>Year</b>	<b>Cost of Production (Ksh.)</b>
<b>2015</b>	
<b>2014</b>	
<b>2013</b>	
<b>2012</b>	

9).Kindly provide us with the Total Value of Assets held by the company over the past few years below:

<b>Year</b>	<b>Value of Assets (Ksh.)</b>
<b>2015</b>	
<b>2014</b>	
<b>2013</b>	
<b>2012</b>	

10).Kindly provide us with the Net Income of the company over the past few years below:

<b>Year</b>	<b>Net Income Assets (Ksh.)</b>
<b>2015</b>	
<b>2014</b>	
<b>2013</b>	
<b>2012</b>	

11).What are some of the milestone that your company has accomplished since you started implementing new products?

12).Are you involved in products innovation at your Organization in any way?

Yes [ ]

No [ ]

13).Please indicate (√) the extent to which you agree with each of the following statements. **Where: 1= Strongly Disagree, 2=Disagree, 3= N/A, 4= Agree, 5= Strongly Agree.**

	1	2	3	4	5
It is all about target market not product innovation					
To command a higher market share, you need innovative ideas					
Customer value proposition is linked to innovation					
Product innovation creates a competitive edge for Manufacturing Firms					
To sustain profitability, Manufacturing firms need to be innovative.					
The nature of Technology and processes influence product innovation					
Competition among Manufacturing Firms drives product innovation.					
Product Innovation is determined by organization culture					
Organization strategy and goals impact on product innovation and need to be continuous					

=====**The End and Thank You**=====

**Appendix II: LIST OF PRIVATE MANUFACTURING FIRMS  
(SAMPLE)**

- 1 All Pack Industries
- 2 Auto Litho LTD
- 3 Auto Springs Manufacturers LTD
- 4 Bayer EA LTD
- 5 Bidco Oil Refineries
- 6 Biersdorf East Africa LTD
- 7 Brush Manufacturers LTD
- 8 Coca Cola company
- 9 Colgate-Palmolive EA
- 10 Crown Paints kenya LTD
- 11 East Africa Packaging
- 12 Excel chemicals LTD
- 13 Farmers choice
- 14 General Motors
- 15 Haco industries
- 16 Kapa Oil Refineries
- 17 Kenbro Industries LTD
- 18 Kenpoly ManufacturersLTD
- 19 Kenya Litho LTD
- 20 Kenya Nut company LTD
- 21 Kim-Fay (EA) LTD
- 22 LG Harris & Co. (EA) LTD
- 23 Mabati Rolling Mills Lt
- 24 Manji Foods industries LTD
- 25 Mann Manufacturing CO.LTD
- 26 Manufacturers & Supplies LTD
- 27 Mastermind Tobacco (K)
- 28 Metal crown LTD
- 29 Modern Lithographic
- 30 Nestle Foods LTD
- 31 Orbit chemicals
- 32 Osho Chemicals
- 33 Ozzbeco kenya ltd
- 34 Patco Industries LTD
- 35 Pipe Manufacturers
- 36 PZ Cussons (EA) LTD
- 37 Rockbern Coffee LTD
- 38 Sadolin Paints (EA) LTD
- 39 Signode packaging systems LTD



- 40 Stat pack Industries LTD
- 41 Tarpo industries LTD
- 42 TechPak Industries LTD
- 43 Tetra packaging LTD
- 44 Unilever Kenya LTD
- 45 Wringly (EA) LTD