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## EFFECT OF INTEREST RATE ON INVESTMENT AND PRODUCTION IN SMALL AND MEDIUM SCALE ENTERPRISES: CASE STUDY OF SELECTED COMPANIES IN EDO STATE

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### ABSTRACT

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An empirical study to appraise the effect of interest rate on investment and production in small and medium scale industries is presented here. Data collected using the questionnaire administered to the various companies was analysed, using statistical tools namely Cochran Q-test and percentage analysis. The Cochran Q-test was used to analyse the part of the questionnaire that required a Yes/No response, while the percentage analysis was done to ascertain the percentage of respondents that answered a particular question. With the Cochran model applied on the responses, a computed value of  $Q_{cal} = 40.722$  was obtained while a value of 23.68 at 95 percent of significance was obtained from the Cochran table. With the calculated value higher than the value from the table, it can be said that the data collected during the study does not provide sufficient evidence for us to accept the null hypothesis ( $H_0$ ) which argued that there are no laid down criteria for Yes/No response. Hence the alternative hypothesis which clearly depicts the reality of the questions asked was accepted. From the percentage analysis, it was deduced that 60% of firms got their initial finance from personal resources, while 33.33% got their finance from relatives and none of the firms got its initial finance from the bank. 73.33% of the firms gave their reason for not going to the bank for their initial finance as due to high interest rate, while 26.67% gave their reason as due to lack of collateral.

**Keywords:** Interest Rate, Investment, Production, Entrepreneurs

### INTRODUCTION

Every organization requires capital to set up business. Organization may be engaged in commerce, production of goods, service rendering or even spiritual/religious matters. Entrepreneurs or proprietors need capital to be able to co-ordinate men and materials in order to achieve their target goals. Capital in this case may be in the form of fixed assets such as plants and machineries, raw materials or labour.

For whatever reason that capital is required in an organization, it has to be sourced for, in a market place called the capital market. In the capital market, plants, machineries and fiscal cash go for a cost. This cost at which capital is sourced is known as cost of capital. If the entrepreneur is unable to make a down payment for the capital sourced for, a negotiated mode of payment is usually agreed upon. In this wise, a sum of money over and above, the initial capital sourced for, from the capital supplier (the lender) is paid on a regular basis by the capital user (the borrower). The sum of money paid as a compensation for the use of the capital borrowed is called the interest on capital.

The argument in this matter is that the cost of capital (otherwise known as the rate of interest) has direct bearing on savings of the individual, investment, production level and employment of labour. It is the determination of the kind of relationship, which exists between rate of interest, and these other variables mentioned above that form the nexus of this research.

Cost of goods and services are not stable because cost of production keeps changing. This is due to the fact that many firms depend on borrowed capital to finance their production. Since cost of borrowing is not stable, so also the cost of goods tends to undulate or oscillate in accordance with the cost of capital. <sup>[1]</sup>

It is pertinent to mention that beyond the rates which banks display on their rates board or publish on the pages of newspapers, there are far higher rates (actual rates) which are made known to customers during interviews with the bank officials. These actual rates, otherwise known as the invisible rates" are what really hinder customers from obtaining loans from the bank. The rates normally published by a bank, which is now known, as the "visible rates" are just there to make customers feel that these banks are following the central bank interest rates regulations. According to an accountant in one of the first generation banks:

*"In an economy with this type of high interest on borrowed capital, the right thing is that borrowers must be very sure of their rate of returns on investment before they can borrow and invest. The implication therefore is that people or investors who are not risk takers tend to avert investment risk by either refusing to borrow cash or staking very little in the economy".*

Whatever option taken by risk averting entrepreneurs, there is a direct bearing on the economy. This is of concern to the researchers for the following reasons. First, output or capacity utilization in a factory will be at jeopardy if the company cannot source for sufficient quantity if there is shortage of cash to purchase them. Secondly, the consequence of lack of adequate raw materials supply in investment is underutilization of the installed capacity of the factory. This will lead to high cost of per unit output and a drop in total profit. Investment rate may drop as the aggregate demand for the company's production suffers a slump.

Ultimately the aggregate manpower requirement in the production activities will fall and the unemployment rate will rise. When this kind of chain reaction occurs in an economy, job seekers are at disadvantage and even those already in employment are at high risk of losing their jobs.

The basic functions of interest rates in an economy in which individual economic agent takes decision as to whether they should invest, save and/or consume are summarized in IMF (1993) under three broad aspects.

First interest rates, as return on financial assets serve as incentive to savers, making them defer present consumption to a future date. He added that the relevant interest rates in this case are the deposit rates. In this connection, interest rates affect the availability of

saving.

Secondly, interest rates, being a component of cost of capital, affect the demand for and allocation of loanable funds. The applicable rate of interest in this case is the bank lending rates, the charges which influence investor's willingness to invest in machine and equipment. In this way, the level of interest (lending) rate would influence growth in the financial instrument, output and employment.

Third, the domestic interest rate, in conjunction with the rate of return on foreign financial assets, expected change in exchange rate and expected inflation rate determine the allocation of accumulated savings among domestic financial assets, foreign goods and goods that are hedged against inflation. These broad roles of interest rates emphasize their significance in the structure of basic prices and in particular the study of the impact of high interest rates on investment, production and employment in small and medium scale industries. <sup>[2]</sup>

The effect of interest rate on production can easily be seen through its impact on investment. Klein J.J. argued that a high level of expenditure on plant and equipment, inventories, and residential construction is generally considered to be one sign of a healthy and growing economy. He added that, an increase in the amount of productive plant and equipment enhances the output capabilities of the workforce and thus enables any given amount of labour to produce more goods for the economy. He further explained that higher output lead to higher consumption levels and a higher standard of living. <sup>[3]</sup>

A rise in the interest rate would normally accompany a restriction of credit, and this would again raise the cost of capital to the company. It would also raise the cost of stockholding of work – in – progress, and credit extended to customers. Restriction of bank credit might leave firms short of liquidity (i.e funds available for immediate use). He added that these may lead firms to cut back on their money outgoing by for example, reducing their holdings of stocks including stock of finish goods, laying off workers (resulting to unemployment), cutting advertising expenditure or doing whatever is possible to make immediate reduction in spending. <sup>[1]</sup>

But Keynes, J.M in the general theory of employment, interest and money subjected to critical examination the, (neo) classical theory of the relationships between monetary and non monetary factors determining the flow of income, the volume of employment, the rate of interest and the level of consumption and investment. He undertook an elaborate analysis of the interrelations of these factors with a set of tools. He denied various established propositions like the rate of interest is the price which equilibrate the supply of savings with investment demand, that unemployment is due merely to frictional disturbances couples with an unwillingness to work at the prevailing wage rate; and the lowering of money wages tends to increase the volume of employment and output. Though, in his book, there was no statistical verification, it made a strong advance in theoretical analysis and constituted the foundation on which for decade a large super-structure of thought has been erected. <sup>[4]</sup> That investment is a function of profit and interest rate is not a recent phenomenon, some theories have been postulated as regard the forms and direction of relationships. <sup>[5]</sup>

Interest rates are central to the economy because they affect the cost of investment and thereby are an important determinant of investment and aggregate demand. For instance, when interest rates fall, the cost of investing falls, and business buy more equipment and structures, while households buy more houses. <sup>[6]</sup>

## **METHODOLOGY**

The aim of this research is to investigate the effect of interest rates on savings, investment and production in some selected small and medium scale industries in Edo State. Furthermore, this research, in it descriptive and explanatory characteristics attempts some useful suggestions as solution to the problem. Questionnaires, were administered to samples of small/medium scale industries, directly affected by the issue of high interest rates.

### **Area of Study**

The three senatorial districts of Edo State were used as a case study. Many variables were studied in relation to interest rates. But special attention was paid to savings, investment, production and employment, with a view to the effect of high interest on these variables.

### **Selection of Sample**

The sample frame consists mainly of selected manufacturing companies. The sample size 'n' is (15) fifteen-manufacturing companies. The sample size of 15 was chosen in view of representativeness as well as cost and time constraints. Edo State has been chosen and seen as truly representative for the following reason.

- i. Edo State is a commercial State (especially Benin City).
- ii. Edo State is an industrial State with availability of developmental plots.

### **Source of Data**

Primary sources of data collection were from manufacturing companies, by means of questionnaires administered to mostly management staff of the Companies. The questionnaires were complemented by Oral interviews to facilitate responses. Attempts were made to avoid pre-empting responses. Although some interviewing techniques were adopted (especially Oral interview), the bulk of data were from questionnaire.

The questionnaire method was used for the following reasons inherent in the questionnaire method.

- i. Questionnaire tend to reduce biases error
- ii. Questionnaire are impersonal
- iii. There is absence of pressure for immediate answers, especially where questions require facts that need to be crosschecked. <sup>[7]</sup>

A major disadvantage of the questionnaire method however must be acknowledged and that is. there is no control over who fills out the questionnaire. This is a maior reason why *Journal of Engineering and Applied Sciences* to verify or invalid *Volume 2, September 2010*

In building up the questionnaire, consideration was given to eliciting facts and opinions based on practice. To this end the close-ended questionnaire was considered. The

close-ended questionnaire is in two categories: 1. Yes or No and 2. Reasons and sources of funds. In the analysis of the last category, percentage was used, while Cochran Q model was applied for the Yes or No category.

**METHOD OF DATA ANALYSIS**

The methods of data analysis as stated above are explained below.

**Cochran Q-Test**

Cochran Q test is represented by Q and can be used for two or more variables. This is to determine if any difference between the expected and observed outcome can be attributed to the chances. The test is done at either 99% or 95% confidence level. That is 0.01 or 0.05 of significance level.

The formula for Q-Test is given below in equation 2.1

$$Q = \frac{(k-1) \left( k \sum_{j=1}^k G_j^2 - \left( \sum_{j=1}^k G_j \right)^2 \right)}{k \sum_{i=1}^N l_i - \sum_{i=1}^N l_i^2} \dots\dots\dots (2.1)$$

Where,

K-1 = The degree of freedom (Dof)

K= number of responses/question

G<sub>j</sub>= sum of the responses along the column, for each j respondent.

L<sub>i</sub>= sum of all responses along the rows for each i response.

N= number of respondent (irrespective of the company).

Decision Rule: The null hypothesis is tested with the value Q<sub>tab</sub> from Cochran’s table. If Q<sub>cal</sub> (observed/calculated Q) is greater than Q<sub>tab</sub> (Q<sub>cal</sub> > Q<sub>tab</sub>), the null hypothesis is rejected.

But if Q<sub>cal</sub> is less than Q<sub>tab</sub> (Q<sub>cal</sub> < Q<sub>tab</sub>) the null hypothesis is accepted and the alternative hypothesis rejected.

**HYPOTHESIS**

**Null hypotheses (H<sub>0</sub>):** There is no streamline criterion or guideline for “Yes” or “No” response for question asked.

**Alternative Hypothesis (H<sub>A</sub>):** A “Yes” or “No” response depends on the reality or controvertibility of the questions asked.

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section of the questionnaire which the Cochran Q-test could not handle. The step involves determining the percentage of the number of respondents that answer a particular question asked.



$$+225+225+225+225+225+225+225+225+225+225+225+225+225+225+196+196+169+196+121+100+225+144+81+14+225+196+196+196+196+196+196+225+196 = \underline{8991}$$

**Step Five**

This involves the computation of all calculated value by substituting into the formula given in equation 2.1.

Before applying the Cochran Q formula, the following expression needs to be evaluated:

$$\begin{aligned} \sum_{j=1}^{15} G_j &= G_1+G_2+ G_3+G_4+G_5+G_6+G_7+G_8+G_9+G_{10}+G_{11}+G_{12}+G_{13}+G_{14}+G_{15} \\ &= 43+44+40+45+38+43+42+43+41+42+45+45+37+39+45 = \underline{632} \end{aligned}$$

Where,

G<sub>j</sub> represent sum of responses to each j question.

Thus,

$$Q = \frac{(k-1) \left( k \sum_{j=1}^k G_j^2 - \left( \sum_{j=1}^k G_j \right)^2 \right)}{k \sum_{i=1}^N l_i - \sum_{i=1}^N l_i^2}$$

$$Q = \frac{(15-1) \left( 15(43^2 + 44^2 + 40^2 + 45^2 + 38^2 + 43^2 + 42^2 + 43^2 + 41^2 + 42^2 + 45^2 + 45^2 + 37^2 + 39^2 + 45^2) - (632^2) \right)}{15(633) - (8991)}$$

$$Q = \frac{14(400890 - 399424)}{504}$$

$$Q = \frac{20524}{504}$$

$$Q = 40.72$$

A comprehensive table showing all the computed values for the responses of the respondents is shown in table 1.

**Step Six**

Finally, using Dof of K-1 = 15 - 1 = 14 with the level of significance of 0.05, the table value of Q = Q<sub>tab</sub> is 23. 68.

**Table 1: Responses to Questions**

	RQ4	RQ5	RQ6	RQ7	RQ8	RQ9	RQ10	RQ11	RQ12	RQ18	RQ21	RQ22	RQ23	RQ26	Li	Li <sup>2</sup>
1.	1	1	1	1	1	1	1	1	1	1	1	0	0	1	13	169
2.	1	1	1	1	1	1	1	1	1	1	1	0	0	1	13	169
3.	1	1	1	1	0	1	1	1	0	1	1	1	1	1	13	169
4.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	225
5.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	13	169
6.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	225
7.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	225
8.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	225
9.	1	1	1	1	1	1	0	1	1	1	1	1	1	1	14	196
10.	1	1	0	1	1	1	1	1	1	1		1	1	1	14	196
11.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	225
12.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	225
13.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	225
14.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	225
15.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	225



16.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	225
17.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	225
18.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	225
19.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	225
20.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	225
21.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	225
22.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	225
23.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	225
24.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	225
25.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	225
26.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	225
27.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	225
28.	1	1	1	1	1	1	1	1	1	1	1	0	1	1	15	225
29.	1	1	1	1	1	1	1	1	0	1	1	0	1	1	14	196
30.	1	1	1	1	1	1	1	1	1	1	1	1	0	1	13	169
31.	0	0	1	1	0	1	1	1	1	1	1	1	0	1	11	121
32.	0	1	0	1	1	1	1	0	0	1	1	0	0	1	10	100

33.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	225
34.	1	1	1	1	1	0	0	0	0	0	0	1	1	1	12	144
35.	1	1	1	1	1	0	0	1	1	1	1	1	1	1	9	81
36.	1	1	1	0	0	0	0	1	1	1	1	1	1	1	15	225
37.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	196
38.	1	1	1	1	0	1	1	1	1	1	1	1	1	1	14	196
39.	1	1	1	1	0	1	1	1	1	1	1	1	1	1	14	196
40.	1	1	1	1	1	1	1	1	1	1	1	0	1	1	14	196
41.	1	1	1	1	1	1	1	1	1	1	1	0	1	1	14	196
42.	1	1	1	1	0	1	1	1	1	1S	1	1	1	1	14	196
43.	1	1	0	1	1	1	1	1	1	1	1	1	1	1	14	196
44.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	225
45.	1	1	0	1	1	1	1	1	1	1	1	1	1	1	14	196
46.	G1 = 43	G2 = 44	G3 = 40	G5 = 38	G6= 42	G7- 42	G8- 43	G9- 41	G10 =42	G11 =45	G12 =45	G13 =39	G14 =39	G15- 45	$\sum li$ =6 33	$\sum li^2$ = 899 1

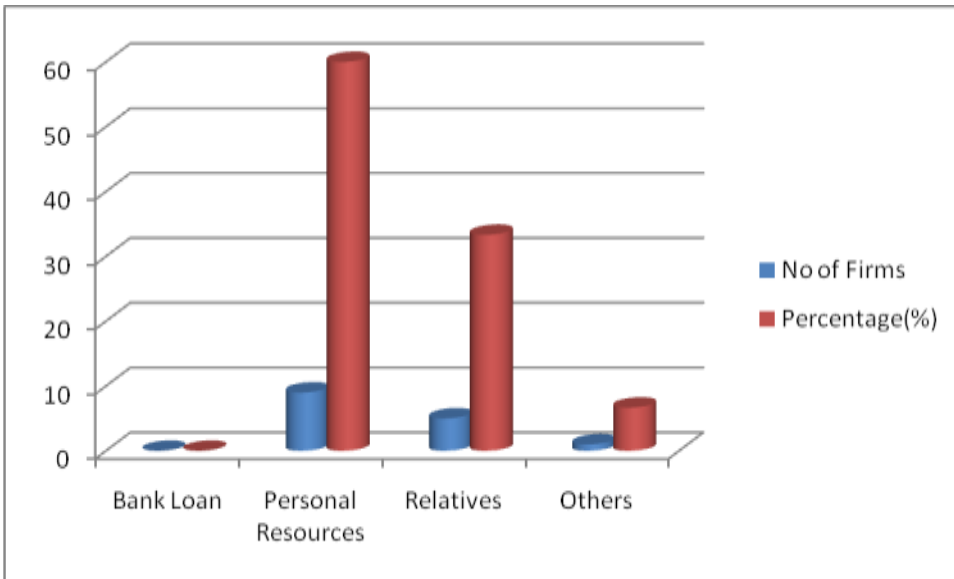
**PERCENTAGE ANALYSIS**

The percentage analysis was applied to the following questions:

1. How did you get the initial finance to set up your company?
2. Why did you not use the bank?
3. Does your company normally raise loan from Bank? If not why?
4. What is the major hindrance to your getting financial assistance from the bank?
5. What form of effect do you consider high interest rate would have on the rate of production and investment in the economy?
6. What form of effect do you think high interest rate has on savings?

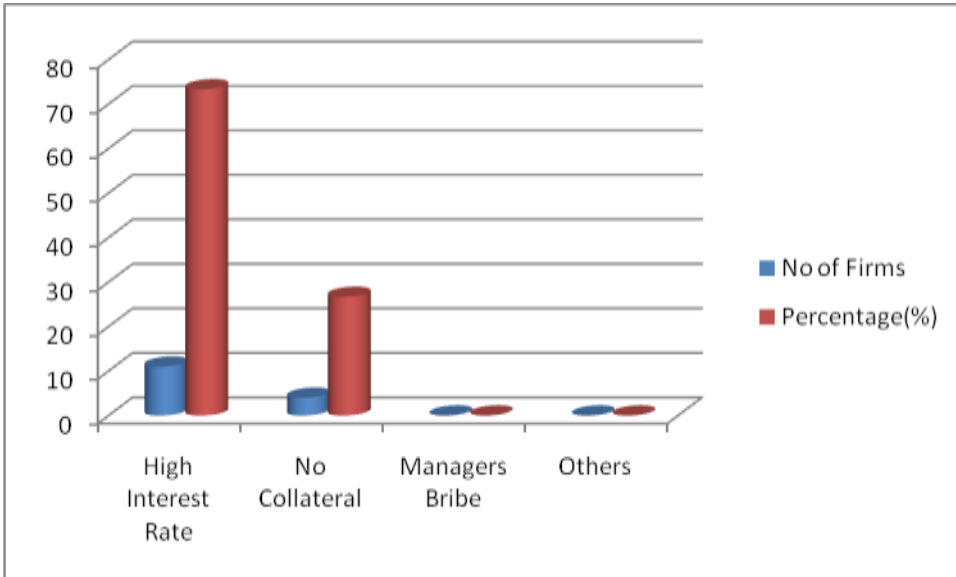
The graphs below depict the outcome of the responses to the questions stated above respectively.

**1. How did you get the initial finance to set up your company?**



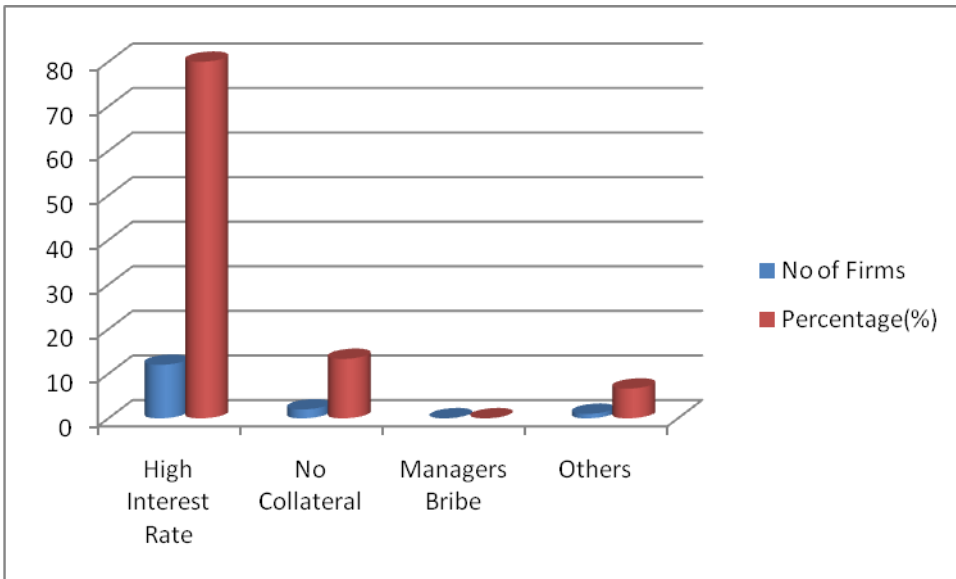
**Figure 2.1: Graph of Sources of funds versus Number of firms.**

**2. Why did you not use the bank?**



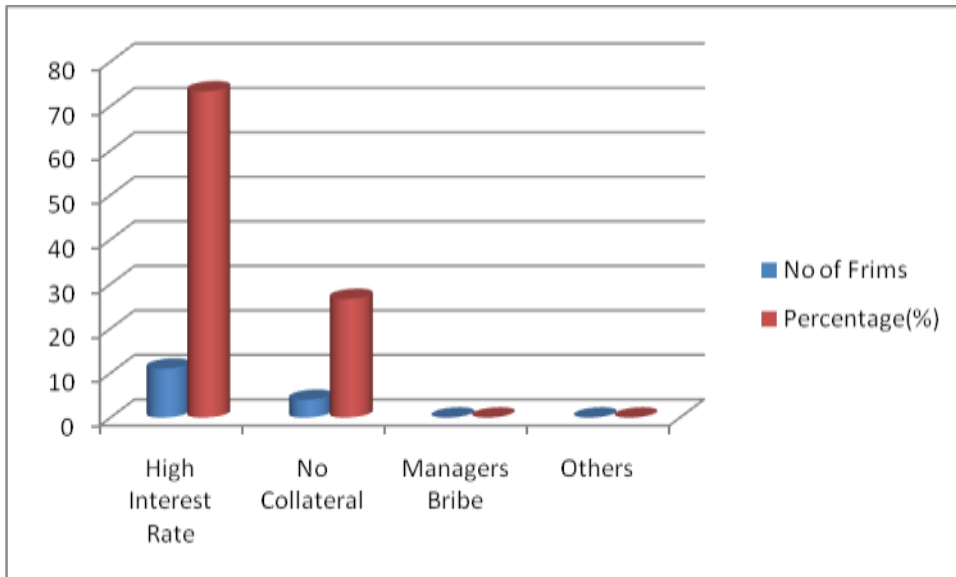
**Figure 2.2: Graph of Reasons for not using the bank versus number of firms.**

**3. Does your company normally raise loan from Bank? If not why?**



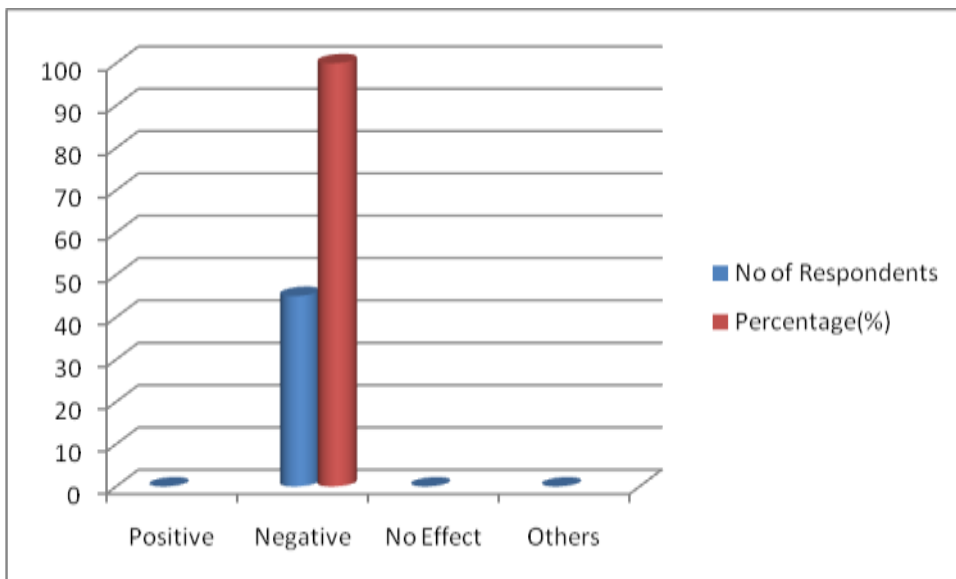
**Figure 2.3: Graph of Reasons for not taking loans for the bank versus number of firms.**

**4. What is the major hindrance to your getting financial assistance from the bank?**



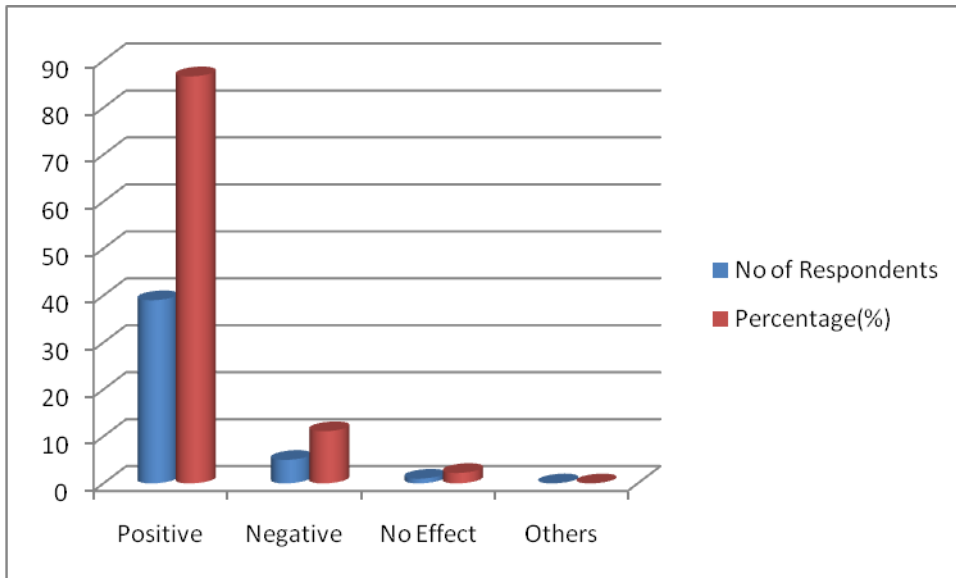
**Figure 2.4: Graph of hindrance to getting bank assistance versus number of firms.**

**5. What form of effect do you consider high interest rate would have on the rate of production and investment in the economy?**



**Figure 2.5: Graph of effect of high interest rate versus number of respondents.**

**6. What form of effect do you think high interest rate has on savings?**



**Figure 2.6: Graph of high interest rate on savings versus number of respondents.**

**RESULTS AND DISCUSSIONS**

**Cochran Q – Test**

The Cochran Q -Test involves matrix of 0 and 1 responses, which is equivalent to No/Yes response. With this matrix, the Cochran model was applied which gave a Q value computed as  $Q_{cal} = 40.722$ , while the tabular value under Cochran table was found to be 23.68 at 0.05 level of significance. Since  $Q_{cal} = 40.722$  is greater than  $Q_{tab} = 23.68$  ( $Q_{cal} = 40.722 > Q_{tab} = 23.68$ ), it can be said that the data collected during the study does not provide sufficient evidence for us to accept the null hypothesis ( $H_0$ ) which argued that there are no laid down criteria for Yes/No response. We therefore infer the alternative hypothesis ( $H_A$ ). Our conclusion therefore is that there is a streamline for Yes/No response; hence the responses were base on reality of the questions asked.

**Percentage Analysis**

From the percentage analysis depicted in the graphs, the following results summarized below were obtained:

1. From figure 2.1, majority (60%) of the firms got their initial finance from personal resources, while 33.33% got their finance from relatives. None of the firms got its initial finance from the Bank.
2. From figure 2.2, majority (73.33%) of the firm gave their reason for not going to bank for their initial finance as due to high interest rate. While few firms (26.67%) gave their reason as due to lack of collateral.

3. From figure 2.3, majority (80%) of the firms gave their reason for not going to bank to raise loan because of high interest rate. While very few (13.33%) of the firms gave their reason as due to lack of collateral.
4. From figure 2.4, majority (73.33%) of the firms who have gone to the bank for pressing financial assistance said they were hindered from getting the assistance due to high interest rate. Only 26.67% of the firms said they were hindered from the assistance because of lack of collateral.
5. From figure 2.5, all the firms (100%) said that high interest rates has negative effect on investment and production in the economy.
6. From figure 2.6, majority of the firms (86.67%) said that high interest rate has positive effect on savings, but 11.11% of the firms said that it has a negative effect on savings.

### **CONCLUSIONS**

From the result, we therefore conclude that the current rate of interest in Edo State is high. Consequently, investors are either hindered from getting financial assistance from the bank to set up a small-scale industry or expand their existing industries. Thus, the investment and production level of the small and medium scale industries are affected. Such effects normally lead to capacity under-utilization and subsequent inability of the firm to meet up with its financial obligations as they fall short. Similarly, our finding also revealed that high lending rate contribute to the cost of goods as it affects production, because there is not enough capital for expansion. Hence, unemployment in this sector is inevitable. The result also revealed that majority of investors depend on other sources of funds like personal resources, relatives etc. to set up or expand their business due to high rate of interest.

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