

Inadequate Access to Finance: A Bottleneck for Entrepreneurial Vibrancy in Ilaro, Ogun State, Nigeria

Olufunmilayo Temitope Afolayan

General Studies Department, The Federal Polytechnic, Ilaro, Ogun State, Nigeria

E-MAIL: afolayan.olufunmilayo@yahoo.com

DOI: 10.6007/IJARBS/v6-i10/2346 URL: <http://dx.doi.org/10.6007/IJARBS/v6-i10/2346>

ABSTRACT

This study seeks to establish the inadequacy of access to finance as a bottleneck for the growth and vibrancy of entrepreneurship in Ilaro, Ogun State, Nigeria. The paper adopts a descriptive research design. Structured questionnaire was used to elicit information from a cross-section of SME operators in Ilaro. A simple random sampling technique was adopted to select the respondents. A total of 170 copies of questionnaire were administered out of which 155 copies representing 91.2% were filled and returned. Data collected were analysed using descriptive statistics while formulated hypotheses were tested using Z-statistics. Results indicated that lack of collateral and unwillingness of individuals to guarantee bank loans are major hindrances to accessing bank credits. Personal savings and loans from families and friends are also grossly inadequate to grow SMEs. The study also revealed that majority of the respondents relied on their personal savings to start up due to stringent conditions attached to bank loans. The study therefore recommends that SME operators should form trade associations to ease access to credits through group guarantee by pooling resources together as collateral. They also need to act ethically, be responsible and trustworthy for banks to be willing to do business with them; there is the need for banks to also relax their conventional credit rules through good and favourable policies when dealing with SME operators. This will not only benefit the SME operators but the nation at large.

Key Words: Bank credits, Entrepreneurial vibrancy, Inadequate access, Ilaro, Personal Savings, SME operators

1.0 INTRODUCTION

Globally, micro- and small enterprises have been identified as an essential driver of innovation, employment generation, economic growth and socio-economic development (Adejumo, 2001; Morris & Lewis, 1991; Schumpeter, 1934). These enterprises make up the social fabric and generate sustainable development because they are firmly rooted in their communities.

Given the important role that entrepreneurship is believed to play in the process of creative destruction and job creation (Schumpeter, 1934) - and hence economic growth, especially as evidenced in east Asian countries; policy makers in Nigeria have finally realized and come to terms with the fact that entrepreneurship is a major means through which the country can get out of her doldrums as related to the issues of unemployment and weak economic base.

Kerr and Nanda (2009) note that surveys of current and potential entrepreneurs suggest obtaining adequate access to capital as one of the biggest hurdles to starting and growing new businesses. Other constraints to entrepreneurial growth especially in Nigeria include infrastructural decay, poor access to markets, poor regulatory frameworks and policies, insecurity, and so on (Abimbola & Agboola, 2011; Goedhuys & Sleuwaegen, 2009).

Affordable and appropriate access to finance is an important issue not only for newly-starting and growing companies, but also for existing ones who wish to expand their operations. It is thus significant for all businesses who strive to gain productivity, foster innovation, experience vibrant growth, and hence create employment and wealth for the wider national and international benefits. The paper therefore seeks to examine the financial constraints and their effects on the vibrancy of entrepreneurship in Ilaro, Ogun State, Nigeria.

1.1 Research Objectives

The study is set to achieve the following objectives:

- To ascertain the adequacy or otherwise of own savings and personal fund in starting and growing small businesses in Ilaro;
- To determine the factors that hinder SMEs from accessing bank loans in Ilaro.

1.2 Research Questions

From the above stated objectives the following research questions are formulated:

- Are personal savings adequate in starting and growing SMEs in Ilaro?
- What are the factors hindering SMEs from accessing bank loans in Ilaro?

1.3 Research Hypotheses

Following the research questions above, the following hypotheses are stated in their null forms:

- H0: Personal savings are not inadequate in starting and growing SMEs in Ilaro.
- H0: Unwillingness on the part of the people to guarantee loans to SMEs does not significantly constitute any hindrance to accessing bank loans in Ilaro.
- H0: Lack of collateral does not hinder access to bank credits by SMEs in Ilaro.
- H0: High cost of credit does not hinder SMEs from seeking bank credits in Ilaro.

Following this introductory section is section 2 which reviews the literature. Section 3 discusses the methodology, section 4 presents and discusses the results while section 5 concludes the paper with some recommendations.

2.0 LITERATURE REVIEW

Adequate access to finance serves as impetus for the growth, prosperity and vibrancy of all firms, especially the newly-established ones. In a study conducted by National Bureau of Statistics, it is evident that 97 per cent of all businesses in Nigeria employ less than 100 employees, implying that 97 per cent of all businesses in Nigeria are small businesses. The study also shows that the SME sector provides on the average, 50 per cent of Nigeria's employment and 50 per cent of its industrial output (NBS, 2007). Fatai (2011) claims that about 80 per cent

of SMEs are stifled because of poor financing and other associated problems. However, Agwu and Emeti (2014) argue that the problem of financing SMEs is not so much the sources of funds but rather its accessibility.

Beck, Demirguc-Kunt, Laeven & Maksimovic (2006) note further that firms with greater access to capital are more able to exploit growth and investment opportunities. However, lack of access to credit as observed by GOK (2005) is a major impediment inhibiting the growth of micro enterprises. Factors identified to be inhibiting funds accessibility according to Adepoju (2003) are the stringent conditions set by financial institutions which include lack of adequate collateral and credit information and cost of accessing funds.

Gichuki, Njeru and Tirimba (2014) observe that small and medium enterprises operate on tight budgets often financed through owner's own contribution, loans from friends and relatives. This usually makes it difficult for them to meet day-to-day expenses let alone purchase machinery, equipment and raw materials. In the study of Ntakobajira (2013), access to finance was found to affect performance of SMEs to a great extent because it limited the entrepreneurs' ability to take advantage of opportunity as and when they arose.

2.1 Theoretical Framework

This study on financial constraints and SMEs will be explained by two theories. First, the **"Pecking Order"** Theory (POT) which was developed by Myers and Majluf (1984) suggests that information asymmetries about the true value of the firms of the SMEs between the 'inside' management and the 'outside' investors, makes the owners prefer to finance investment projects with internal funds in the first instance. Another common phenomenon in the sector which makes the POT applicable is the desire of the firm owners to retain control of the firm and maintain managerial independence which may not be possible with the involvement of another party (Jordan, Lowe & Taylor, 1998).

These factors imply that MSE owners rely on sourcing their capital from a pecking order of, first, their 'own' money (which includes personal savings and retained earnings); before looking elsewhere (such as short-term borrowings, longer-term debt, and least preferred of all, from the introduction of new equity investors, which represents the maximum intrusion).

Total reliance on POT depends not solely on demand-side preferences, but also on the availability of the preferred source of financing. Many factors influence the supply of finance; of particular importance is the stage of development of the firm. For instance, start-up and nascent firms usually depend on personal funds of the owners of the firms, as well as to some extent, funds from families and friends. However, another issue is whether families and friends have enough to part with for such 'uncertain' and 'risky' ventures. For small firms like those mentioned above, the certain source of fund is the one raised personally, but often times this is grossly inadequate.

The second known as the **"Credit Rationing"** Theory (CRT) by Stiglitz and Weiss (1981) focuses on financing gap analysis. They both argued that agency problems (that is, a conflict of interest between management (agents) and the shareholders (owners) of the organisation), and information asymmetries are the major reasons why SMEs have constrained access to finance.

They contend that only SMEs know their real financial structure, the real strength of the investment project and the effective intention to repay the debt. That is, firms have superior private information (asymmetric information). Hence, the bank manager makes decisions under asymmetric information and operates under a moral hazard and adverse selection risk.

Asymmetric information can lead to credit rationing conditions by modifying the risk-return distribution – a fact which encourages banks to refuse capital for investments and produces divergence between capital demand and supply (Alfo & Trovato, 2006). Finance constraints resulting from credit rationing behaviour may not produce efficient results. Due to information asymmetry, managers may grant loans to less profitable investments while more profitable ones are left out, resulting in adverse selection and moral risks.

Start-up, small and nascent firms stand the chance of being more affected by information asymmetry. Despite their high potentials for growth and profitable investments, the likelihood of being rationed and denied loans is very high due to their size. They are particularly perceived as being risky. Although, they might be willing to pay more to compensate for the additional risk, the banks will refuse to raise the interest rate sufficiently to equate supply and demand.

Deakins, North, Baldock and Whittan (2008) observe those information asymmetries are more common in new and technology-based propositions. They argued at an early stage, information is limited and not always transparent; assets are often knowledge-based and exclusively associated with the founding entrepreneur.

3.0 METHODOLOGY

The study area is Ilaro in Ogun State, Nigeria. The target population consists of the cross-section of an approximated 300 operators of micro- and small business enterprises, made up mainly of barbers, welders, fashion designers, hair dressers, block-making industry, clothing and shoe vendors, food vendors. The estimated population was obtained from the various trade associations available in Ilaro. A simple random sampling technique was adopted by the study to select the respondents to avoid the problem of selection bias.

To arrive at the sample size, Raosoft sample size calculator was used (Chimucheka, 2013), which gave 170 elements at 95% confidence level, 50% response distribution and the margin of error of 5%. A structured questionnaire which comprises the questions that addressed the objectives of the study was used to obtain data from the respondents, while analysis was done using descriptive method. This entails the use of frequency tables and percentages. In order to test the stated hypotheses, Z-test statistical technique was employed. Out of the 170 copies of questionnaire administered, 155 copies representing 91.2% were filled, returned and used for the analysis while 15 copies (8.8%) were not returned.

4.0 PRESENTATION OF FINDINGS AND DISCUSSION

Most of the literatures reviewed elaborate extensively on the constraints usually faced by SME owners in the course of accessing fund for starting, running and growing their businesses especially in Nigeria. However, the need to establish the applicability of these in Ilaro, Ogun State, Nigeria necessitated this study. This section presents, analyzes and discusses the data collected from the respondents.

4.1 Responses on Research Questions

4.1.1 Source of Start-Up Capital

Table 1 indicates how the respondents obtained their start-up capital. It shows that majority (70.97%) of them sourced their capital from personal savings followed by 22.58% of the respondents who obtained theirs from family/relatives. Only 6.45% obtained their capital from the banks. This implies that the respondents chose to obtain their start-up capital from sources that are devoid of stress of providing collateral and individuals who will stand as sureties for bank loans. Personal funds and that of families do not require such stringent conditions (Adepoju, 2003).

Table 1: Response Pattern on Source of Start-Up Capital for SMEs in Ilaro

Responses	Frequency/Number of Observations	Percentage
Personal Savings	110	70.97%
Family/Relatives	35	23.58%
Bank Loans	10	6.45%
Total	155	100.0%

Source: Field Survey, 2016

4.1.2 Adequacy of Personal Savings in Starting and Growing Businesses in Ilaro

Table 2 shows responses to whether personal savings and own funds are adequate in starting and growing businesses in Ilaro. It was found that 92.26% of the respondents believed this source of capital is highly inadequate in starting and growing businesses in Ilaro; 1.29% expressed an adequate opinion while 6.45% expressed a mild adequacy opinion. This means that personal savings will only make SMEs to operate on tight budgets, which will make it difficult for them to meet day-to-day expenses let alone purchase machinery, equipment and raw materials. This implication is buttressed by the observation of Gichuki, Njeru and Tirimba (2014).

Table 2: Response Pattern on Inadequacy of Personal Savings in Starting and Growing Businesses in Ilaro.

Responses	Frequency/Number of Observations	Percentage
Adequate	2	1.29%
Mildly Adequate	10	6.45%
Highly Inadequate	143	92.26%
Total	155	100.0%

Source: Field Survey, 2016

4.1.3 Factors Hindering SMEs from Accessing Bank Credit

(a) Are private individuals willing to guarantee bank loans to SMEs in Ilaro?

Table 3 indicates that a total of 18 respondents representing 11.6% revealed that individuals are willing to guarantee bank loans when approached while 129 (83.2%) claimed that people

are unwilling to act as guarantors. 8 respondents (5.2%) declared they do not know because they have never approached anyone for such gesture, and therefore do not know whether they will be willing to perform the role or not when contacted.

This means that people are not willing to accept responsibility for any loan default considering the high percentage of 83.2% who are unwilling. We therefore conclude that unavailability of individual guarantor constitute a major bottleneck to accessing bank credits by SMEs in Ilaro.

Table 3: Response Pattern on Willingness of Individual Guarantors for Bank Credits in Ilaro

Responses	Frequency/Number of Observations	Percentage
Willing	18	11.6%
Unwilling	129	83.2%
Do not know	8	5.2%
Total	155	100.0%

Source: Field Survey, 2016

(b) To what extent does lack of collateral hinder access to bank credits by SMEs in Ilaro?

Table 4 shows that 77.4% of the respondents believed that lack of collateral constitute to a large extent a major bottleneck in accessing bank credits in Ilaro; 16.1% claimed it is a constraint to a mild extent while 6.5% felt it constitutes, to a poor extent, a constraint to accessing loans. This means that lack of collateral is a major challenge to obtaining bank credits just as unwillingness of individual guarantors. This is logical because both serve as securities for accessing bank credits. Some of the reasons that might be responsible for lack of collateral include poverty, high cost of living and lack of assets that will adequately serve as collateral.

Table 4: Response Pattern on the Extent to which Lack of Collateral Constitute a Challenge to Accessing Bank Credits in Ilaro

Responses	Frequency/Number of Observations	Percentage
Large Extent	120	77.4%
Mild Extent	25	16.1%
Poor Extent	10	6.5%
Total	155	100.0%

Source: Field Survey, 2016

(c) To what extent does high cost of credits prevent SMEs from seeking bank loans in Ilaro?

Table 5 shows that 47.1% (73) of the respondents believed that high cost of credits to a large extent prevents SMEs from accessing loans. 4.5% (7) expressed a mild extent opinion while 48.4% (75) claimed high cost of credits to a poor extent, hinder them from seeking credits.

This implies that majority of the SME operators in Ilaro are not constrained by high loan processing fees, high interest rates, high bank charges (COT), long repayment period, high expenses incurred during travelling in the process of looking for credit, etc when accessing or

seeking bank loans. It means SME operators are more concerned about business yield and the profit they expect to make after considering all costs incurred during production.

Table 5: Response Pattern on the Extent High Cost of Credits Hinder SMEs from Accessing/Seeking Bank Loans in Ilaro.

Responses	Frequency/Number of Observations	Percentage
Large Extent	73	47.1%
Mild Extent	7	4.5%
Poor Extent	75	48.4%
Total	155	100.0%

Source: Field Survey, 2016

4.2 Test of Hypotheses at 5% Significant Level (95% Confidence Level)

4.2.1 Hypothesis 1

H₀: Personal savings are not inadequate in starting and growing SMEs in Ilaro

H₁: Personal savings are inadequate in starting and growing SMEs in Ilaro

As shown in appendix 1, calculated Z (Z_{cal}) = 21.04, which is greater than the critical Z (Z_c) of 1.96 to the right of the two-tail test at 5% margin of error. We thereby reject H₀ and accept H₁. This implies that personal savings are inadequate to start and grow small and medium businesses in Ilaro.

4.2.2 Hypothesis 2

H₀: Private individuals are not unwilling to guarantee bank loans to SMEs in Ilaro

H₁: Private individuals are unwilling to guarantee bank loans to SMEs in Ilaro

As indicated in appendix 2, $Z_{cal} = 16.53$ is greater than $Z_c = 1.96$ at 5% significant (95% confidence) level. Thus we reject H₀ and accept H₁. This implies that private individuals are not willing to guarantee bank loans in Ilaro and this significantly constitutes a major challenge to SMEs in accessing loans.

4.2.3 Hypothesis 3

H₀: Lack of collateral does not hinder access to bank credits by SMEs in Ilaro

H₁: Lack of collateral does hinder SMEs access to bank credits in Ilaro

As revealed in appendix 3, $Z_{cal} = 13.6$ is greater than $Z_c = 1.96$ at 95% confidence level. We therefore reject H₀ and accept H₁. This means that lack of collateral constitutes a major bottleneck in accessing bank credits in Ilaro.

4.2.4 Hypothesis 4

H₀: High cost of credits does not hinder SMEs from accessing bank credits in Ilaro

H₁: High cost of credits hinders SMEs from accessing bank credits in Ilaro

Appendix 4 reveals that $Z_{cal} = -1.4442$ while $Z_c = 1.96$ at 95% confidence level or 5% significant level. As observed here, $Z_{cal} (-1.4442)$ in absolute term is less than $Z_c (1.96)$. This is because the 'minus' sign in a two-tail test is inconsequential. Hence, we do not reject H₀. This therefore means that high cost of credits does not hinder SMEs from accessing bank credits in Ilaro.

5.0 CONCLUSION AND RECOMMENDATIONS

This study sought to establish the extent to which inadequacy of access to finance has constrained the growth and vibrancy of SMEs in Ilaro, Ogun State, Nigeria. Vibrant entrepreneurship has been identified as a means of creating employment, enhancing economic growth and achieving sustainable development globally and in Nigeria particularly.

Structured questionnaire was administered to the cross-section of small and medium business operators in Ilaro. Information gathered were analysed using the descriptive method, while Z-statistics was used to test the formulated hypotheses. Findings show that majority of the respondents relied on personal savings for start-up due to stringent conditions attached to accessing bank loans. It also revealed that personal savings were not adequate for growing businesses.

Some of the factors the study identified to constrain access to bank credits in Ilaro and which negatively affect the growth of businesses include: (1) lack of willingness on the part of individuals to guarantee bank loans; (2) lack of assets that will be used as collateral for loans. Surprisingly and in contrast to what is available in the literature, cost of credits does not significantly hinder SMEs from accessing credits from banks in Ilaro.

Following the findings from the study, the following suggestions are made:

(1) SME owners should come together to form trade groups or associations that are reflective of their types of enterprise. This will enhance their chances of securing bank credits with little or no stress. It is evident from the study that relying on personal fund will not take their businesses far and individual guarantors are not readily available.

(2) SME operators need to be responsible and trustworthy. They need to act ethically if they are to be trusted not only by bank officials, but also by the potential private guarantors and their customers. The major fear of private guarantors is taking responsibility in case of loan default.

(3) Banks should come up with policies that will relax their conventional credit rules when dealing with SME operators. They need to come up with products that are best suited for SMEs, where collateral requirements are lenient. This will not only benefit SME operators but the nation at large.

REFERENCES

- Abimbola, O. H. and Agboola, G. M. (2011). Environmental Factors and Entrepreneurship Development in Nigeria. *Journal of Sustainable Development in Africa*; Vol 13, No 4; pp 166-176.
- Adejumo, G. (2001). Indigenous Entrepreneurship Development in Nigeria: Characteristics, Problems and Prospects. *Advances in Management: Journal of Department of Business Administration*, University of Ilorin, Nigeria; 2 (1); pp112-122.
- Adepoju, B. A. (2003). An Appraisal of the Factors Inhibiting Entrepreneurial Undertaking in Contemporary Nigeria: A Case Study of SMEs in Kano Metropolis. *Nigerian Journal of Business Administration*, Department of Business Administration, UNIBEN, Vol 5, No 2; July.

- Agwu, M. O. and Emeti, C. I. (2014). Issues, Challenges and Prospects of Small and Medium Scale Enterprises (SMEs) in Port-Harcourt City, Nigeria. *European Journal of Sustainable Development*, Vol 3, No 1; pp 101-114.
- Alfo, M. and Trovato, G. (2006). Credit Rationing and the Financial Structure of Italian Small and Medium Enterprises. CEIS Tor Vergata-Res. Paper Series, 27 (80): 1-20.
- Beck T.; Dermiguc-Kunt, A.; Laeven, L. and Maksimovic, V. (2006). The Determinants of Financing Obstacles. *Journal of International Money and Finance* 25; 932-954.
- Chimucheka, T. (2013). Obstacles to Accessing Finance by Small Business Operators in the Buffalo City Metropolitan Municipality. *East Asian Journal of Business Management*, Vol 3, No 2; pp 23-29. Available @ [www.eajbm.org/journal/article.php?code = 2670](http://www.eajbm.org/journal/article.php?code=2670). Retrieved on 28/8/2016.
- Deakins D.; North, D.; Baldock, R. and Whittan, G. (2008). SMEs Access to Finance: Is There Still a Debt Finance Gap? *Belfast: Institute for Small Business and Entrepreneurship*.
- Fatai, A. (2011). Small and Medium Scale Enterprises in Nigeria: The Problems and Prospects. Available @ www.thecje.com/journal/index.php/economicsjournal/article/.../8
- Gichuki, J.; Njeru, A. and Tirimba, O. (2014). Challenges Facing Micro and Small Enterprises in Accessing Credit Facilities in Kangemi Harambee Market in Nairobi City County, Kenya. *International Journal of Scientific and Research Publications*; vol 4, issue 12; December; pp 1-25.
- Goedhuys, M. and Sleuwaegen, L. (2009). High-growth Entrepreneurial Firms in Africa: A Quartile Regression Approach. *Small Business Econ. (Online)*; vol 34, pp 31-51. Available @ http://www.springerlink.com/content/k08263_2_5_hlm_39477/fulltext.pdf doi:10.1007/s11187-009-9193-7.
- Government of Kenya, GoK (2005). Development of Micro and Small Enterprises for Wealth and Employment Creation for Poverty Reduction. *Sessional Paper*; No. 2; Government Printers, Nairobi, Kenya.
- Jordan, J.; Lowe, J. and Taylor, P. (1998). Strategy and Financial Policy in UK Small Firms. *Journal of Business Finance and Accounting*, 25; 1-27.
- Kerr, W. R. and Nanda, R. (2009). Financing Constraints and Entrepreneurship. *Harvard Business School Working Paper* 10-013. Available @ www.hbs.edu/faculty/Publication_Files/10-013.pdf. Retrieved 29/8/16.
- Morris, M. H. and Lewis, P. S. (1991). Entrepreneurship as a Significant Factor in Social Quality of Life. *Journal of Business Research*; 23 (1); pp 21-36.
- Myers, S. C. and Majluf, N. S. (1984). Corporate Financing and Investment Decisions when Firms have Information that Investors Do Not Have. *Journal of Financial Economics*, June; 187-221.
- National Bureau of Statistics, NBS (2007). Small and Medium Enterprises in Nigeria.
- Ntakobajira, N. (2013). Factors Affecting the Performance of Small and Micro Enterprises (SMEs) Traders at City Park Hawkers Market in Nairobi County, Kenya.
- Schumpeter, J. A. (1934). *The Theory of Economic Development*. Cambridge: Harvard University Press.

Stiglitz, J. E. and Weiss, A. (1981). Credit Rationing in Markets with Imperfect Information.
American Economic Review, 71; 393-419.

Appendix 1

Calculated Z for hypothesis 1

From table 2:

$$P=143; \quad Z_{cal} = \frac{92.26\% - 50\%}{\frac{50\%(1-50\%)}{\sqrt{155}}} = \frac{0.9226 - 0.5}{\frac{0.5(1-0.5)}{\sqrt{155}}}$$

$$= \frac{0.4226}{\frac{0.5(0.5)}{\sqrt{155}}} = \frac{0.4226}{0.25} \times \sqrt{155}$$

$$Z_{cal} = 1.69 \times 12.45 = 21.04 > Z_{critical} (1.96) \text{ at } 5\% \text{ significant level}$$

Appendix 2

Calculated Z for hypothesis 2

From table 3:

$$P = 129; \quad Z_{cal} = \frac{83.2\% - 50\%}{\frac{50\%(1-50\%)}{\sqrt{155}}} = \frac{0.832 - 0.5}{\frac{0.5(1-0.5)}{\sqrt{155}}}$$

$$= \frac{0.332}{\frac{0.5(0.5)}{\sqrt{155}}} = \frac{0.332}{0.25} \times \sqrt{155}$$

$$Z_{cal} = 1.328 \times 12.45 = 16.53 > Z_{critical} (1.96) \text{ at } 95\% \text{ confidence level}$$

Appendix 3

Calculated Z for hypothesis 3

From table 4:

$$P = 120; \quad Z_{cal} = \frac{77.4\% - 50\%}{\frac{50\%(1-50\%)}{\sqrt{155}}} = \frac{0.774 - 0.5}{\frac{0.5(1-0.5)}{\sqrt{155}}}$$

$$= \frac{0.274}{\frac{0.5(0.5)}{\sqrt{155}}} = \frac{0.274}{0.25} \times \sqrt{155}$$

$$\sqrt{155}$$

$$Z_{cal} = 1.096 \times 12.45 = 13.6 > Z_{critical} (1.96) \text{ at } 5\% \text{ significant level}$$

Appendix 4

Calculated Z for hypothesis 4

From table 5:

$$\begin{aligned}
 P = 73; \quad Z_{cal} &= \frac{47.1\% - 0.5\%}{\frac{50\% (1-50\%)}{\sqrt{155}}} = \frac{0.471 - 0.5}{\frac{0.5(1-0.5)}{\sqrt{155}}} \\
 &= \frac{-0.029}{\frac{0.5(0.5)}{\sqrt{155}}} = \frac{-0.029 \times \sqrt{155}}{0.25}
 \end{aligned}$$

$Z_{cal} = -0.116 \times 12.45 = -1.4442$, which is less in absolute value than $Z_{critical} (1.96)$ at 5% significant level. Therefore, we fail to reject the null hypothesis.