INFLUENCE OF GREEN LOANS ON PERFORMANCE OF MANUFACTURING FIRMS LISTED ON NAIROBI SECURITIES EXCHANGE, KENYA

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Abstract: *Within environmental management principles, firms are increasingly gravitating towards environment friendly activities to enhance sustainability. Based on this, the effect of Green loans on Performance of manufacturing firms listed on Nairobi Securities Exchange was examined. The study used signalling theory, to shed more light on the variables under consideration. A descriptive research design was applied. The target population comprised of 9 manufacturing firms listed at Nairobi Securities Exchange. The study specifically targeted a total of 81 managers from each cadre of management of the firms. The study adopted a census survey since the population of the study, 81 managers of the manufacturing firms listed at NSE was small. Primary and secondary data was collected where primary data collection was done by use of a semi-structured questionnaire while a data collection sheet was used to collect secondary data. Analysis of data relied on SPSS version 26. Mean, frequency in addition to standard deviation are the main descriptive statistics that were employed. Multiple linear regression was used to analyze data. Afterward tables and figures were utilized in result presentation to enhance visibility and understanding. The results of the study revealed that all of green loans, a positive and significant impact on performance of manufacturing firms listed on NSE. The study concludes that that an improvement in use of green loans will result to an improvement in the performance of manufacturing firms listed on NSE. This study recommends manufacturing companies to seek out green financing to fund activities such as raising environmental awareness, ratifying contractual agreements requiring the company to improve environmental practices/mitigate environmental risks, enabling the company to systematically manage high environmental risks associated with financed activities, and raising awareness and conducting community training on environmental protection.*

Keywords: *Green loan, Green financing strategy, Firm Performance*

Introduction

Globally, climate change, global warming, decline in the number of manufacturing processes pollution control as well as demand for environment-cognizant products are among the issues that are facing manufacturing firms. Reducing the impact of manufacturing activities on the environment has been core requirement of these firms as a result of ever-growing cognizance of environmental concerns accompanying these economic activities (Li, Liao & Albitar, 2020). Manufacturing firms thus face the task of having to come up with innovative processes for the purpose of meeting green demands (Oláh, Kitukutha, Haddad, Pakurár, Máté & Popp, 2019). Through green financing, manufacturing firms obtain the necessary financial resources to carry

out operations and projects that meet green environment demands. Environmental protection as well as the economic burden on industry is forcing manufacturing firms throughout the world to gravitate toward re-evaluation of various operations as well as business processes (Oláh *et al.,* 2019).

Green loans are finances that are obtained by a firm to enable and empower the firm to carry out operations and finance projects with distinct environmental impact (Fernando, Jabbour & Wah, 2019). Green loans basically demonstrate the commitment of a firm towards the development of a sustainable economy by engaging in processes that are environment friendly. According to Yakovlev and Nikulina (2019), green financing strategies can also be construed as means by which firms mobilize funding or financial resources for processes aimed at raising resource efficiency. The three main financial instruments in green finance are equity, debt and securities. With regard to equity financing, shares (ownership interests) are issued by a firm to investors who provide funding for green project and processes. In debt financing, firms obtain financial resources from lenders that is repaid with interest. Debt green financing strategies take two forms which are green loans and green bonds (Della Croce, Kaminker & Stewart, 2011).

Green business initiatives including but not limited to green financing have been found to have a considerable constructive impact on manufacturing firm's productivity. Firms particularly those in manufacturing segment employing green loans for production aimed at improving eco-friendly effects of their activities are more productive than those that do not. According to Chukwuka and Eboh (2018), green loan initiatives positively affect employees' productivity leading to improved firm productivity.

Problem Statement

An important area of focus for manufacturing firms globally has become green financing practises. Fuel costs that are incessantly rising and changing weather patterns are deemed negative consequences of environmental neglect by manufacturing firms globally (Mitra & Datta, 2014). As organizations interact with the environment, acquiring inputs for various processes to produce goods has become more expensive owing to negative effects some manufacturing activities have on the environment. The manufacturing industry is becoming cognizant of the impact of their processes on the environment with informed consumers now aware of the need for the firms to account for environmental conservation initiatives. Manufacturing firms that set environmental and social objectives and strive to achieve them through by pursuing green finances position themselves to enjoy the benefits of such involvement in way of improved performance (Çankaya & Sezen, 2019). Varoius studies been conducted on green loans, Li *et al.,* (2018) and Zhang (2018) focused on green loans and credit while Zhou and Cui (2019) Alonso-Conde et al., (2020) and Sebastiani (2019) examined the impact of green bonds on corporate performance. On the same note, while Sebastiani (2019) focused on green bonds in energy and utilities sectors, this study will focus on manufacturing firms to address the sectoral difference. The two studies by Legenchuk *et al.,* (2020) and Nassr *et al.,* (2014) examined securitization as an innovative refinancing mechanism thus failed to incorporate other green financing strategies such as green loans and green credit. This study aimed to fill this gap by providing empirical evidence of influence of green loans on performance of manufacturing firms in a local context.

Objective of the Study

This study sought to analyse the influence of green loans on performance of manufacturing firms listed on Nairobi Securities Exchange

Value of the Research

The current study intended to provide insights into knowledge about investors to secure funding for investments that provide environmental benefits for environmentally sustainable manufacturing and economic development.

To policy and legislative, the findings of this study guide in identification of gaps for the purpose of informing policy makers about effective strategies for sustainable green financing especially in the manufacturing sector.

Literature Review

Theoretical Foundation of the research

Stakeholder Theory, Proposed by Freeman (1984), states that a firm owes a responsibility to a wider group of stakeholders, other than just shareholders. According to Gibson (2000), stakeholders represent any group or individual affected by the accomplishment of the objectives of an organization.

Strategically, the whole idea around stakeholder theory gravitates around managing as well as incorporating relationships and welfare of various groups such as customers shareholders, employees and suppliers for future purposes and in a manner that is likely to assure an organization long term success (Freeman et al, 2007). It is assumed that management of manufacturing firms are conscious of the environmental impact of manufacturing activities and are keen on making behavioral adjustments for environmental reasons. This then drives firms to adopt innovative strategies that will seek to eliminate environmental damage and enhance sustainability. It is for this reason that manufacturing firms pursue green loans to finance environment-cognizant projects and activities.

Empirical Literature Review

Green Loans and Firm Performance

For environmental protection, manufacturing firm carry a responsibility of green production and processes which relies on technique progress and innovations. Availability of external financing has an indispensable influence on the technique invention activities of manufacturing firms and their level of performance. A study by Li, Liao, Wang and Huang (2018) examined green loan and subsidy for promoting clean production innovation in China. Serial game theory models were applied with various results showing that performance is higher for firms willing to execute technique innovation supported by green loan. Commercial banks are also willing to approve green loan for firms that comply with green loan principles. Furthermore, green loan subsidy provided by the government improves the intention of firms to technique innovation which improves performance.
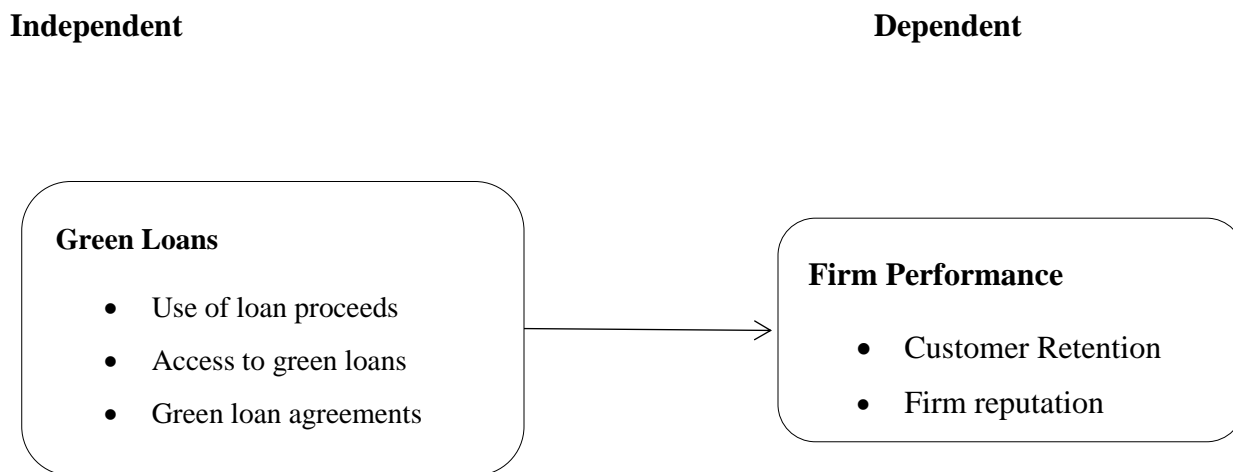
According to a study that was carried out by Zhang (2018) on green credit and financial performance, the results showed that green credit has a positive impact on bank's financial performance, providing a basis for the continued development of green credit for firms to improve their performance. The investigation used financial data of Industrial Bank from 2005 to 2017, empirically testing the impact of commercial bank green credit on financial performance by analysing ROA. Innovative green credit products to meet market demand were recommended as well as improving internal organization structure of banks and the level of green credit management to allow more flow of green loans.

A study by Agathou and Schuite (2015) on environmental performance of African microfinance institutions applied Green Performance Agenda framework for the purpose of assessing and building a business case for sustainability. The findings from a sample of 87 Micro-Finance Institutions that participated in the survey indicated that data on green loans is the easiest indicator to track, followed by the environmental footprint of a financial institution's operations. Tracking awareness-raising and training activities for clients and the community followed while monitoring the environmental risk of loans pre- or post-disbursement was identified as the most challenging area to track. The results also showed that by tracking data on green loans, MFIs are able to improve their financial performance as they monitor the environmental risks associated with the loan.

Conceptual Frame Work

The conceptual model figure 1 presents a schematic picture of the researchers presumed perception of existing relationship between the variables. Figure 1 below shows the visual depiction of the theorized relation of variables. The schematic diagram captures the linkages in the literature. The model suggests an interrelationship among there groups of the study namely: green loans – as independent variable; on firm performance as dependent variable that may be influenced by the other variables.

Fig 1: A Conceptual Model showing Green loans and Firm performance.

Independent   **Dependent**

Green Loans

- Use of loan proceeds
- Access to green loans
- Green loan agreements

Firm Performance

- Customer Retention
- Firm reputation

Source Researchers (2022)

Methodology

Research Design

A research design is defined as the strategies used in a study to guide data collecting and describe how the data will be analyzed to answer research objectives (Schoonenboom & Johnson, 2017). Descriptive research designs are widely regarded as the most appropriate for conducting inquiries based on both primary as well as secondary data examinations, and this approach was used. The primary rationale for such a design is its

power to process for explanations the problem at hand and aid in the collection of data needed to answer the question.

Population of the study

According to Kothari (2004), population refers to a group of items within a specific research area. This research focused on nine manufacturing companies that are listed on the NSE (Appendix III). As a result, the unit of analysis was comprised of the nine manufacturing firms. The study primarily targeted 81 managers, including three responders from each management cadre from the nine manufacturing firms listed on the NSE. Table 1 shows the demographics of the target population.

Table 1: Target Population

Cadre	Population
Top level management	27
Middle level	27
Operations	27
Total	**81**

Source: Researcher (2022)

Sampling Technique and Sample Size

Ishak and Bakar (2014) characterize a sample frame as the whole list of populations to be investigated. This study included a list of nine manufacturing companies that were listed on the NSE. Sampling allows for the collection of a representative sample. Sampling ensures that a sufficient number of participants are chosen such that the selected group shares the same characteristics as the rest of the population. Because the population of the research, 81 managers, was small, the study used a census survey to avoid sampling. This is acceptable since it fits within Blumberg, Cooper, and Schindler's proposed range of 200 or fewer (2014). This is also supported by Israel (1967), who claims that when the target population is smaller than 200, census is preferred to sampling.

Data collection

This research gathered and analyzed secondary as well as primary data from a variety of sources. It was utilized to look at the impact of green finance on the performance of manufacturing companies listed on the NSE. A semi-structured questionnaire was utilized to gather main data, and a secondary data collection template was employed to obtain secondary data.

Reliability Analysis

A pilot study was conducted on 8 respondents which constitutes 10% of the sample according to recommendations of Julious (2005) for the purpose of ensuring that the research instrument was reliable for data collection. The participants of the pilot study were excluded from the main study to avoid bias. In ensuring reliability of the instrument, the study measured internal consistency of the items of 8 questionnaires that were subjected to pilot test using Cronbach's Alpha value of 0.7 as recommended by (Mugenda & Mugenda, 2003). As indicated in Table 2, the four independent variables all had alpha coefficient values higher than 0.7 ($\alpha > 0.7$) implying that the instrument was reliable for data collection.

Table 2: Reliability Test Results

Scale	Cronbach's Alpha	Number of Items	Comment
Green Loans	0.934	8	Reliable
Firm Performance	0.824	8	Reliable

Source: Field Data (2022)

Response Rate

A total of 81 questionnaires were distributed to the study's respondents in order to acquire the necessary data. In all, 52 questionnaires were completed and returned, as shown in Figure 3. This equated to a 64.2 percent overall response rate. The 35.8% non-response rate is due to respondents' apprehension about disclosing information that they considered sensitive. The response rate is in line with the recommendations of Batty, Gale, Kivimäki, Deary, and Bell (2020), who claim that a response rate of more than 55% is sufficient for statistical analysis of the gathered data.

Descriptive statistics

Green Loans

The first objective of the study was to examine the influence of green loans on performance of manufacturing firms listed on Nairobi Securities Exchange. First, respondents specified the types of green loans obtained by their respective manufacturing firm. The results are presented on table 3.

Table 3: Type of Green Loans Obtained by the Manufacturing Firm

Type of Green Loan	Frequency	Percent
Renewable energy loans	9	17.3
Energy efficiency loans	7	13.5
Waste management loan	16	30.8
Clean water/ water treatment loan	20	38.5
Total	**52**	**100**

Source: Research Data (2022)

Results in table 3 indicate that the largest proportion of manufacturing firms listed in NSE obtained clean water/ water treatment loan as represented by 38.5 percent, followed by 30.8 percent who obtained Waste management loans and 17.3 percent who obtained Renewable energy loans. A further 13.5 percent of respondents reported that their firms obtained Energy efficiency loans. The results imply that manufacturing firms listed in NSE various green loan items ranging from clean water/ water treatment loan to renewable energy loans and energy efficiency loans.

The average responses for the various statements regarding the influence of green loans on firm performance given a Likert scale of 1-5 are as shown on Table 4 next page.

Table 4: Descriptive Results on Green Loans

Statement	Mean	Std Dev.
There is a high demand for our green bonds compared to conventional bonds	4.15	1.09
The firm uses green loans to conduct activities related to raising awareness of environmental impacts.	3.90	1.19
There are clauses in loan agreements of the firm that require it to improve environmental practices/mitigate environmental risks.	4.08	1.12
The firm applies specifically designed tools to evaluate the environmental risk of its activities	3.94	1.30
The firm has access to specific loans linked to environmentally friendly products and processes.	4.04	1.17
The firm systematically manages the high environmental risks of financed activities	3.85	1.29
The firm utilises green loans to raise awareness and conduct community training on environmental protection	3.69	1.39
The firm conducts environmental risk assessment when applying for green loans	4.60	0.63

Source: Research Data (2022)

The study's findings revealed that the majority of respondents (a mean of 4.15) agreed that there is a large demand for our green loans as compared to traditional loans. The replies to the aforementioned statement had a standard deviation of 1.09, indicating that there was little variance in the responses. A mean of 3.9 demonstrates that the majority of the respondents agreed on whether the company utilizes green loans to perform activities connected to raising awareness of environmental issues, while a standard deviation of 1.19 reveals a wide range of views. The majority agreed that there are clauses in the firm's loan agreements that oblige it to enhance environmental practices/mitigate environmental risks, with a mean of 4.08 as a value of 1.12 for this the standard deviation of 1.12 indicates that there was a lot of diversity in the replies to the given statement. Furthermore, the majority of respondents (3.94 on average) believed that the company applies specially created techniques to assess the environmental risk of its actions.

Similarly, the majority of respondents agreed that the company has access to particular loans related to environmentally friendly goods and processes, with a mean of 4.04 and a standard deviation of 1.17, indicating a wide range of responses. Most of the participants agreed that the corporation consistently handles the high environmental risks of sponsored operations, with a mean of 3.85 and a standard deviation of 1.19. The majority agreed, with a mean of 3.69, that the firm uses green loans to promote awareness and perform community training on environmental protection, as did the assertion that the firm conducts environmental risk assessment when applying for green loans, with a mean of 4.6. The results in this study imply that majority of the respondents of this study agreed that use of green loans influences various aspects of firm performance.

Performance of Manufacturing Firms

The performance of industrial companies listed on the NSE was used as the study's dependent variable. Table 5 shows the average replies on a Likert scale of 1-5 for the various statements on customer retention and reputation metrics of firm performance.

Table 5: Descriptive Results on Performance of Manufacturing Firms

Performance Metric	Mean	Std Dev.
The firm has retained most of its clients	4.58	0.67
Most of the customers have increased usage of the firm products	4.54	0.73
Customers prefer the firm products more than the other competitors	4.56	0.92
The customers have a positive attitude towards the firm	4.63	0.77
The customers have trust in the firm's services and products	4.62	1.05
The firm is viewed as a leader in the market	4.69	0.81
The firm products and services are viewed to be of high quality	4.75	0.74
The firm is consistent in-service delivery	4.50	0.80

Source: Research Data (2022)

The study's findings revealed that the majority of respondents strongly agreed that the firm has retained most of its clients, that most customers have increased their usage of the firm's products that customers prefer the firm's products over those of competitors, and that customers have a positive attitude toward the firm, with respective means of 4.58, 4.54, 4.56, and 4.63. Standard deviation values of 0.67, 0.73, 0.92, and 0.77, respectively, demonstrated low variability for the aforementioned claims. Similarly, majority of the respondents strongly agreed customers have trust in the firm's services and products, firm is viewed as a leader in the market, firm products and services are viewed to be of high quality and that the firm is consistent in-service delivery as shown by respective means of 4.62, 4.69, 4.75 and 4.5 respectively. The results imply that majority of this study's respondents agreed that the performance of the manufacturing firms listed on NSE in terms of customer retention and reputation has improved.

Inferential Statistics

Table 6: Influence of Green loans on firm Performance

	Model summary		
R	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
.654	0.427	0.391	0.42708

	ANOVA				
	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Regression	6.527	3	2.176	11.929	.000

Residual	8.755	48	0.182	
Total	15.282	51		

Coefficients ᵃ

	Unstandardized Coefficients		Standardized Coefficients		
	B	**Std. Error**	**Beta**	**t**	**Sig.**
(Constant)	1.997	0.826		2.419	0.019
Green Loans	0.196	0.072	0.346	2.703	0.009
Dependent Variable: Firm Performance					

Source: Field Data (2020)

a. Predictors: (Constant), Green Loans

b. Dependent Variable: Firm Performance

Table 6 shows that green loans have a substantial positive relationship with the performance of manufacturing firms listed on the NSE. A Pearson correlation of 0.654 demonstrates this. The finding implies that an increase in green loans leads to a significant increase in the performance of manufacturing companies listed on the NSE. Green loans account for up to 42.7 percent of the variance in performance of manufacturing businesses listed on the NSE, according to the model's R-square.

The F statistic, with a p-value of 0.000 and so less than 0.05, validated the regression model's significance. The F computed statistic of 11.929 is more than the $F_{(3, 48)}$ critical value of 2. 798, confirming this. Green Loans therefore suitable variables in forecasting variations in performance of manufacturing companies listed on the NSE, according to the overall model importance.

The regression results as shown in Table 13 indicated that green loans positively and significantly influenced performance of manufacturing firms listed on NSE (Beta = 0.196, p-value=0.009). The implication of the result is that an improvement in various green loan items results to significant improvement in performance of manufacturing firms listed on NSE. This is consistent with the argument by Zhang (2018) whose study results showed that green loan has a positive impact on bank performance, by providing a basis for the continued development of green credit for firms to improve their performance. Moreover, Agathou and Schuite (2015) contend that by tracking data on green loans, firms are able to improve their financial performance as they monitor the environmental risks associated with the loan.

Conclusion

This study therefore concludes that an improvement in use of green loans to carry out activities related to raising awareness of environmental impacts, ratify contractual agreements that require the firm to improve environmental practices/mitigate environmental risks, enable the firm to systematically manage high environmental risks of financed activities and to raise awareness and conduct community training on environmental protection will result to an improvement in the performance of manufacturing firms listed on NSE.

Recommendation

The research presents the following policy and practice recommendations for Kenya's manufacturing industry, based on the aforementioned results for inference purposes. To improve their performance, manufacturing companies must seek out green loans to fund activities such as raising environmental awareness, ratifying contractual agreements requiring the company to improve environmental practices/mitigate environmental risks, enabling the company to systematically manage high environmental risks associated with financed activities, and raising awareness and conducting community training on environmental protection.

The research was conducted under Research Permit NACOSTI/P/22/15745 that was issued by the National Council of Science, Technology and Innovation (NACOSTI) Nairobi, Kenya.

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