

Evaluating the Impact of Green Financing on Sustainable Development: A Case of Australian and American Banks

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Abstract

Green financing refers to investments made specifically in environment friendly projects while, sustainable development means social, financial and environmental development. They are closely interrelated, as green financing connects the world of finance with social and environmental behaviour. Financial institutions can achieve sustainable development by adopting green financing practices. Banks have the potential to help in reduction of pollution by introducing green loans and green investments. This study explains the impact of green financing on attainment of sustainable development objectives of banks. Secondary data is collected from the audited financial statements and corporate sustainability reports. The findings conclude that green financing has a significant impact on sustainable development.

Keywords: Green Financing, Sustainable Developments, Green Banks.

List of Abbreviations

NI: Net Income

GL: Green Loans

GI: Green Investments

GHG: Greenhouse Gases

CI: Community Investments

Introduction

Environmental deterioration is a major issue currently being faced by countries around the world [1]. A serious consequence of such deterioration is global warming which has become a threat in both the developing and developed countries [2]. Human activities constitute main source of environmental destruction. It is therefore required to minimize the adverse impacts of human activities on the environment [3].

Green financing is a technique which is specially designed for the purpose of unlocking sustainable development as it can facilitate the process of environmental protection along with ensuring financial returns [4]. State bank of Pakistan has defined green financing as environmentally friendly practices that help financial institution to protect environment by introducing projects or programs that result in decreasing emission of greenhouse gases (GHG) and carbon. It has been established that green financing can provide pathways to institutions for achieving sustainable development by synchronizing their financial, social and environmental performance [5]. There are two main parts comprising the green financing strategy adopted by financial institution namely, green loans and green investments [3]. As green loans and green investments are specially designed to finance exclusively environment friendly projects, therefore these projects not only provide financial returns but also can be beneficial for society [7].

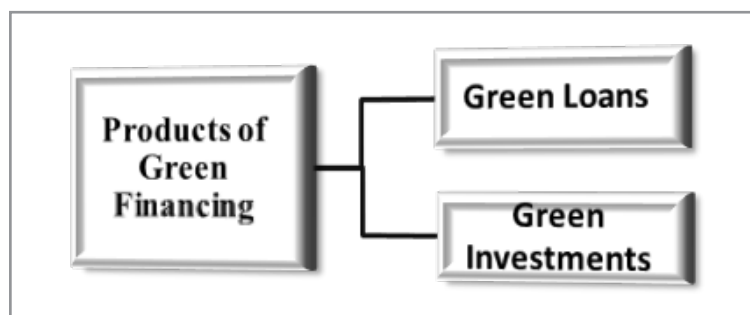


Figure 1: Products of Green Financing
Source: United Nations Environment Programme (2017)

The concept of sustainable development was first introduced by World Commission on Environment and Development commonly known as Brundtland Commission [8]. According to this commission sustainable development refers to meeting the current needs without compromising on future needs and avoiding any adverse effects of our activities on the environment. The three main pillars of sustainable development include social, economic and environmental development and these pillars are interlinked with each other [9]. Various financial institutions around the globe are advancing policies and practices that can unlock the global capital markets for a sustainable future [10].

Promoting green financing means working with financial institutions to integrate environmental factors into their lending activities [11]. The financial system can play an important role in promoting the green transformation of our economies. Despite the fact that financial institutions particularly banks are not contributing directly towards environmental deterioration, still banks can play a role as they may be financing such projects that can exert adverse effects on the environment [12]. As a result, addressing the environmental concerns is considered critical for banks [13].

Green financing is being gradually recognized as crucial by banks around the world especially in Australia and America, where the Australian and American government exclusively puts forward a concept named as Equator Principles. These principles highlight the fact that environmental protection should be given same importance as the financial returns [14]. The Equator Principles provide a framework for banks to assess and manage the

social and environmental impact of large projects to which they provide finance. The equator principles were initially launched by ten members including American cite group bank and Australian Westpac bank in 2003 [15]. The number of members has now increased to eighty-three, which clearly show the importance being given to environmental and social issues along with economic profits [6].

Aim of the Study

Keeping in view the relevance and importance of green financing in current scenario this study explores whether or not the efforts by green Australian and American banks are having an impact on their sustainable development.

Characteristics of Banks

Green banks are pledging millions for promoting green financing which creates the need to undertake research about effectiveness of such huge investment.

Design and Setting for Study

This is descriptive research where relationship between green financing and sustainable development is studied. Panel data is used which possess the characteristics of both longitudinal and cross-sectional data. Secondary data is collected from annual audited reports and corporate sustainability (CSR) reports of banks. Secondary data is collected from the annual reports of the banks. Three models including economic, social and environmental model for American and Australian banks is developed by the researcher.

Description of Variables

Economic Development	Net profit after tax from annual reports (Amounts in US \$)
Social Development	Community investments (Amounts in US \$ from CSR reports)
Environmental Development	GHG Emissions (Amounts in US \$ from CSR reports)
Green Loans	Amounts in US \$ from CSR reports

Statistical Analysis

Three models have been developed and econometrics techniques are applied to analyze the selected relationships. Generalized least squares (GLS) panel regression is employed to test hypotheses for economic, social and environmental model in case of American and Australian banks. Statistical software Stata is used to test all three hypotheses.

Rationale of the Study

Studies have been conducted in the past to investigate the effect of green financing on the sustainable development of banks. In all these studies single aspect of sustainable development is being studied by the researcher. This is the first study which has encompassed all three aspects of sustainable development.

Majority of the studies in this field are of purely theoretical

nature which focuses on explaining various aspects of newly emerging phenomena. There is relatively lesser number of studies of empirical nature. In past studies primary data is used by the researchers to analyze the perception of respondents, whereas this study is based on statistical data obtained from the corporate sustainability reports of banks.

Significance of the Study

The finding of the study provides justification for adoption of green financing even in the developing countries. At present most banking institutions are not aware of the income and risk framework of green investment. This research provides information about how green financing can help for sustainable development of banks, through empirically analyzing the relationship between green financing and social, economic and environmental performance of banks of the Australia and America.

The remaining paper is divided into following sections. Section 2 provides a review of literature, section 3 gives methodology, followed by analysis and interpretations of results contained in section 4. Finally, section 5 covers conclusions, limitation and future directions.

Literature Review

Green Financing

Green financing is being gradually recognized crucial by financial institution around the world with the escalation of greenhouse gases (GHG) and carbon emission resulting in the deterioration of environment [16]. To fight against environmental degradation financial institution adopts green financing to environment friendly business activities and energy efficient industries [17]. Green financing includes financing of green investments for the protection of environment and implementation of environmental policies [18]. Banks are not responsible directly for environmental degradation but may facilitate environmental damage when they support projects that do not meet environmental standards [19]. Therefore, banks need to be careful when deciding about which project to finance. Financial institutions are seriously focusing on the environmental and social performance along with economic performance to achieve sustainable development [5]. Green financing can help banks to focus on environmental and social performance in addition to financial return [20].

A number of countries from the developed and developing world are taking initiatives for promoting green financing because it is essential for economic development and sustainability. It is estimated that global green financing and green infrastructure will reach US \$40 trillion until 2030 [21]. China is the largest and Australia is second largest source of green bond issuance in the first half of 2018 [22]. A lot of investment is being made in green financing schemes in Australia. According to report published by Climate Bonds Initiative (CBI) there are more than 400 projects in Australia and New Zealand which are getting financing under various green financing initiatives. The Clean Energy Finance Corporation (CEFC) is now recognized as a major financier in clean energy projects in Australia that has provided finance to around 4,000 smaller projects [23].

Sustainable Development

Aligning financial returns with sustainable development is a

universal challenge [24]. There is an increasing demand from institutional investors for investment opportunities that support sustainable development since the Paris agreement is signed [25]. Banks should take initiative of green financing not only due to environmental concerns but also for ensuring sustainable development. The structure of sustainable development was developed in 1987 by Brundtland Commission [8]. Sustainable development includes three types of developments; social, economic and environmental development [26]. Jeucken Identified four phases of sustainability for banks including defensive, preventative, offensive and sustainable banking. Sustainable development is important for society to survive. As a part of society, it is important for bank to work for the betterment of this society [27]. Sustainable development is not only related with environmental and social concerns but it also helps to improve financial performance.

Economic development

Many of the studies in past have revealed the positive relationship between the economic development and green financing (Granger, 1969; Wei, 2009) [10]. Nanda and Suresh study the empirically the relation between the implementation of green banking with two variables: net income and profitability using data panel regression model. Cui in his study also found positive relationship between green initiatives and net income after tax. In recent studies by German institute, it's also observed that green finance has positive impact on economic performance of institution [28].

H: Green Financing has an Impact on the Economic Development of Banks.

Environmental Development

Environmental development includes not only temporary environmental protection but also long-term administrations to protect natural resources (Bai, 2011; Azam, 2012; Singh & Singh, 2012). According to Biswas banks need to operate green financing not only to enhance their public image but also to keep investments flow towards sustainable development. Heim & Zenklusen found that investors in stock market have become environmentally sensitive and would not favor the industries that do not comply with the environmental standards. Bahl in his study has clarified that banks should consider before financing whether projects under consideration are environment friendly or not because as part of the society it is corporate social responsibility of banks. Therefore, many banks have started to take various initiatives to focus on environmentally friendly banking practices by greening the business operations (Shaumya & Anton, 2017).

H: Green Financing has an Impact on the Environmental Development of Banks.

Social Development

Sustainable development calls for a convergence between the three pillars namely economic development, social equity, and environmental protection (Drexhage & Murphy, 2010). According to there is relationship exist between environmental, economic and social justice. Hallegate, Treguer and Fay defended that there is positive relationship between green growth and social development as generally changes in economic growth

commonly are related with social improvements. Equator Principles have been adopted by more than 80 financial institutions particularly banks to achieve social benefits along with financial profits [29].

Conceptual Framework

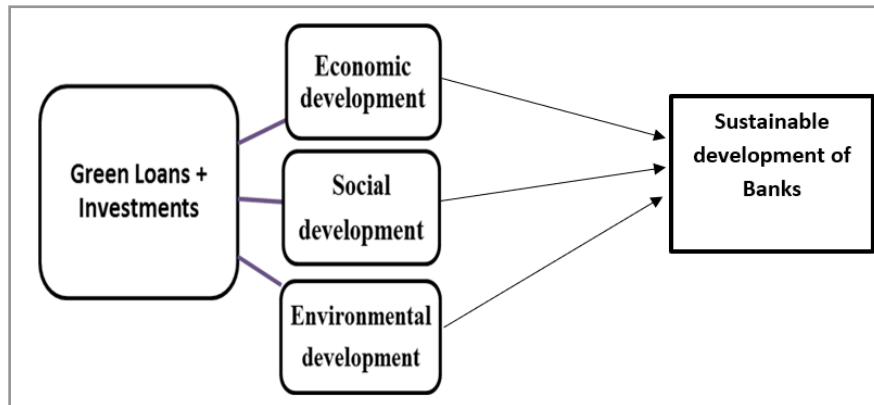


Figure 2: Conceptual Framework of the Study

Research Design and Data Collection

A research design is a road map that defines the whole procedure including data collection, data analysis, and population or sampling technique [30]. The purpose of a study could be descriptive, exploratory, or explanatory [31]. This is descriptive research where relationship between green financing and sustainable development is studied. Panel data is used which possess the characteristics of both longitudinal and cross-sectional data. Secondary data is collected from annual audited reports and corporate sustainability (CSR) reports of banks. Population of this study includes selected banks of USA and Australia offering green loans and Investments. USA has a total of 17 Green

H: Green Financing has an Impact on the Social Development of Banks.

banks whereas Australia has 12 Green banks in total. Data is collected from Annual and sustainability reports of five banks of Australia and five banks of America. The data used in this study were collected on 10 banks over time periods from 2012 to 2017 as both time and individual difference among banks are important factors.

Operationalization of Variables

Two independent and three dependent variables are used in this research. Dependent variables include social, economic and environmental development. Independent variables include green loans and green investments.

Table 1: Variables of the Study

Variables	Measurement
Economic Development	Net profit after tax from annual reports (Amounts in US \$)
Social Development	Community investments (Amounts in US \$ from CSR reports)
Environmental Development	GHG Emissions (Amounts in US \$ from CSR reports)
Green Loans	Amounts in US \$ from CSR reports
Green Investments	Amounts in US \$ from CSR reports

Research Models

Three models have been developed and econometrics techniques are applied to analyze the selected relationships. Generalized least squares (GLS) panel regression is employed to test hypotheses for economic, social and environmental model in case of American and Australian banks.

Economic Model

The economic model is built to find the relationship between economic development (dependent variable) and green loans and investments (independents).

$$NI_{it} = \beta_0 + \beta_1 GL_1 + \beta_2 GI_2 + \mu_{1it}$$

Social Model

The social is used to study the impact of green loans and green

investments (independents) on the community investments (dependent).

$$CI_{it} = \beta_0 + \beta_1 GL_1 + \beta_2 GI_2 + \mu_{2it}$$

Environmental Model

This model is used to assess the impact of green loans and green investments (independents) on the emission of GHG (dependents).

$$GHG_{it} = \beta_0 + \beta_1 GL_1 + \beta_2 GI_2 + \mu_{3it}$$

NI: Net income

GL: Green Loans

GI: Green investments

GHG: Greenhouse gases

CI: Community investments

Descriptive Analysis

Banks	American Banks				Australian Banks			
	Mean	Min	Max	S. D	Mean	Min	Max	S. D
Economic	4818.477	78.5	16000	4639.286	6100.747	195	10260	6300.163
Social	217.0853	30	970	299.4977	194.5833	30.2	612	156.3865
Environmental	2630749	22800	7650000	2856576	172761.9	35230	340250	82625.56
Green Loan	2328.497	22	5600	2130.904	3678.1	650	8888	2448.963
Green Investments	2773.767	15	7500	2502.776	5165.033	202	21881	5782.433

Table 2 is providing brief description of all the variables used in this study. Descriptive analysis is used to calculate mean; standard deviation of all the variables used in the study. As we

can see that values of means and standard deviations are close therefore no or little spread is present in our data.

Regression Analysis

Table 3: Coefficients of Panel Regression Analysis

Coefficients	America			Australia		
	Economic	Social	Environmental	Economic	Social	Environmental
Green Loans	0.000***	0.000***	0.000***	0.042**	0.000***	0.000***
Green Investments	0.997	0.002***	0.000***	0.042**	0.573	0.002***
Adj R2	0.5541	0.4875	0.5238	0.6479	0.5394	0.433
F Value	0.0010***	.0000***	0.0000***	.0193***	.0000***	0.0071***
Hausman Test	0.5408	0.3308	0.9195	0.1994	0.9967	0.8155

***significant at 1% level, ** significant at 5% level, * significant at 10% level.

In economic model the results of the Hausman test are in favor of the random effects model over the fixed effects model in case of both Australian and American banks. The test results from the GLS random effects panel regression of Australian banks (Table 3) show that green loans and green investments are significant at (0.042) 5 %. The result of panel regression confirms that there are relationships exist between green loans and net income after tax of Australian banks. According to regression results of American banks green loans are significant at 1 % as value of coefficient is 0. 000. But there is no impact of green investments on the net income after tax of American banks, as value of coefficient is 0.997. Green loans are significant at 1 % as value of coefficient is 0.000.

In Environmental Model the results of the Hausman test (Table 3) are in favor of the random effects model over the fixed effects model in case of both Australian and American banks. The test results from the GLS random effects panel regression (Table 3) shows that both indicators green loans and green investments are significant (0.000%) at 1 %. According to results shown above (Table 3) green loans and green investments are also significant at 1 % in case of Australian banks. GLS panel regression results confirmed that there is a relationship between the green loans, green investments and reduction in emissions of GHG in case of Australian and American banks.

In Social model the results of the Hausman test (Table 3) are in favor of the random effects model over the fixed effects model in case of both Australian and American banks. The test results from the GLS random effects panel regression (Table 3) shows that green loans and green investments both are significant (0.000%) at 1 % in case of American banks. Results confirmed

that there is a relationship between the green loans, green investments and community investments of American banks. In case of Australian banks, green loans have impact on the community investments significant (0.002%) at 1 %. While Green investments are insignificant as value of coefficient is 0.573, which shows that there is no relationship between green investments and community investments.

Post Regression Test

A number of Post regression test have been performed to check for existence of data related errors like multicollinearity, heteroskedasticity, and autocorrelation in the data. Breusch pagan test is performed to check autocorrelation in data. Variation inflation factor test is performed to check multicollinearity in the panel data. Wooldridge test has been performed to check heteroskedasticity in data. No multicollinearity, heteroskedasticity, and autocorrelation were found in data.

Discussion of Results

The study was focused to find out the impact of green loans, green investments on the sustainable development of selected banks of Australia and America. For this purpose, hypothesis was accepted providing the evidence in literature for statement that green finance has an impact on the sustainable development of banks.

After Analysis of Economic Model, we can conclude green investments and green loans have significant impact on economic development of Australian banks. Hypothesis is accepted in case of American banks. In case of American banks green loans have significant impact on economic development. Wagner shows positive correlation between sustainability performance and fi-

financial performance. Green investments have no significant impact on economic development of American banks. Nanda and Bihari also found in their study that green initiatives have no relationship with net income or profitability. Therefore, hypothesis is partially accepted in case of American banks. Over all we can conclude that economic performance of Australian and American banks has improved significantly from years 2012 to 2017. Cui in his study also found positive relationship between green initiatives and net income after tax. In recent study it's been also observed that green finance has the good impact on economic performance [32]. Therefore, the adoption of green financing techniques is strongly suggested to attain economic development.

In Social model the study was conducted to find out the impact of green loans and green investments on the community investments of selected banks of Australia and America. After analysis of Social Model, we found green loans and green investments have significant impact on Community investments of American banks. Hypothesis is confirmed in case of American banks. The proposed research is supported by literature as (Guo, 2005) also found in his study that social performance has relationship with green initiatives. After analysis, we found green loans have significant impact on Community investments of Australian banks

Findings

Table 4: Findings of Study

	Hypothesis 1		Hypothesis 2		Hypothesis 3	
Green Financing	Economic Performance		Environmental Performance		Social Performance	
	America	Australia	America	Australia	America	Australia
Green Loans	Confirmed	Confirmed	Confirmed	Confirmed	Confirmed	CONFIRMED
Green Investments	Not Confirmed	Confirmed	Confirmed	Confirmed	Confirmed	Not Confirmed

Hypothesis 1 is partially accepted in case of American banks and fully accepted in case of Australian banks. Hypothesis 2 is fully accepted in case of American and Australian banks. Hypothesis 3 is fully accepted in case of American Banks and partially in case of Australian banks.

Conclusion

Increasing concerns about climate change and environmental degradation have resulted in promotion of green financing. To ensure sustainable development unprecedented shift in investment, away from greenhouse gases, carbon emission and towards more resource efficient technologies are required. The financial sector will have to play a central role in this green transformation and green financing is the tool which can help financial institutions to achieve economic profits along with social and environmental performance. Financial institutions particularly banks have been involved due to their very significant roles in business activities. America and Australia are still in an initial stage of green financing. There has been an interesting development in the development of green financing during the last five years. The financial, social and environmental performances of 10 selected banks of America and Australia were analyzed. For year 2018 to 2024 data were collected and tested with panel regression techniques. Results revealed the linkage between green financing and corporate sustainability performance. To conclude

and green investments have no significant impact on Community investments of American banks. Hypothesis is partially accepted in case of Australian banks Over all we can conclude that the results of the analysis suggest that the social performance of Australian and American banks improved significantly between 2012 to 2017 because, after testing the hypothesis we find that green finance have the significant relationship with the community investments of banks.

In environmental model the study was conducted to find out the impact of green loans and green investments on the reductions of GHG emissions of selected banks of Australia and America. After analysis we can conclude that green loans and green investments have significant impact on reductions of GHG emissions of American banks. Nurul Ahmad, Dauda, & Hasmaiza also found same results in his study. Hypothesis is accepted in case of American Banks. In case of Australian banks both green loans and green investments also have significant relationship with environmental performance of banks. Over all we can suggest that the environmental performance of Australian and American banks improved significantly from year 2012 to 2017. Lai & Wong also affirmed green economy minimizes the negative effect on the environment and there is positive relationship between green finance and environmental practices.

we can say that sustainable development can be achieved with the help of green financing [33-35].

Limitation and Future Research

One of the limitations of this study is the availability of data. Data is collected only from the 10 selected banks. It would be interesting to study green finance again when more data will be available. The current work only analyzes the financial, social and environmental performance of the American and Australian banks with few estimated variables. Therefore, in future other institutions like capital markets, insurance companies can also be considered even by using different variables except profitability like ROA or ROE [36-41].

Implications

The study has implications for both academicians and practitioners. For the academics, this study contributes to understand the impact of green financing practices on bank's environmental, and social performance along with financial returns. From practitioners point of view, this study can also provide motivation to other institutions who are now may not be adopting the green financing practices because of perceived risk relative to financial returns.

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