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The Role of Green Financing Practices on Sustainable Development: An Ireland Projection

by

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The Role of Green Financing Practices on Sustainable Development: An Ireland Projection

Abstract

The objective of the research was to recognize the position and influence of green financing practices on sustainable development in Ireland, in particular by assessing green bonds, renewable energy financing, and green loans. These criteria were used to understand how each of these green financing mechanisms leads to sustainable development results. The quantitative research methodology was utilized with a deductive approach, and the data were obtained using a structured survey that was administered to the professionals in finance, renewable energy, and sustainability sectors in the country of Ireland, to 103 participants in total. Data were examined through a descriptive statistics test, reliability test, Pearson correlation, and regression analysis with the help of SPSS software. It was found that the three green financing practices and promotions had a huge positive influence on the sustainable development, and the most notable influence was on green loans, then renewable energy financing, and lastly, green bonds. On the basis of such findings, the research proposed the strengthening of governmental incentives, the increased awareness of the financial institutions, the diversification of green financing tools, regulatory frameworks, and the communication between the parliament and the corporate bodies to each other. The researchers concluded that green financing is a critical element of sustainable development in Ireland, and multi-faceted efforts and policy interventions are necessary to make it the most effective by bringing the stakeholders on board.

Key Words: Green Bonds, Renewable Energy Financing, Green Loans, Sustainable Development, Ireland

Chapter 01- Introduction

The introduction chapter begins by giving an overview of the green financing practice and its importance in relation to the sustainable development, particularly in the Irish context. It defines the reasoning of the study, gives the research problem, and shows the relevance and novelty of the research. The chapter also states the research aim, main objective and sub-objectives, and the key research question that shall be guiding the study. It also outlines the scope and limitations of the study before giving a comprehensive analysis of the role played by green financial instruments in helping Ireland to achieve its sustainability targets.

1.1 Background of the study

Amidst the growing environmental risks and crisis and the universal appeals to meet Sustainable Development Goals (SDGs), the concept of green financing has taken the central stage in harmonizing the financial system with the goals of environmental sustainability. The concept of green finance is rather broad, and it defines financial resources moving into sustainable development projects as well as initiatives promoting the creation of a more environmentally friendly economy (Altunina and Alieva, 2021). Sachs et al. (2019) also state that the financing gap to meeting the SDGs cannot be closed without strategic green capital mobilisation, highlighting the dual roles of green finance in enhancing the environment integrity and economic resilience on a long-term basis.

Similar to other developed economies, Ireland has realised the importance of sustainable finance in guiding the country towards a low-carbon future. Nevertheless, the nation continues to struggle with the major drawbacks in the establishment of sound and scalable green financing systems. The state of green finance in Ireland, as Byrne (2024) points out, is not very developed, although some policy development and institutional interest have recently been observed. According to what Byrne (2024) says, the absence of the private sector involvement and the dispersed nature of the green financial instruments in Ireland reduce the potential effect of these instruments on the outcomes of sustainable development.

The European experience offers useful references to Ireland. Dovidonis (2024) explains the benefits of the Green Deal and sustainable finance taxonomy developed by the European

Union to provide a framework within which green investments can be mobilised in member states. Nonetheless, implementation at the national level, even in Ireland, is usually not very coherent because of different fiscal capacities and different standards of execution of the policies. That points to the necessity of nation-specific research to address how green finance can be operationalised in facilitating sustainable development.

Nevertheless, its usefulness is tightly connected with the strength of regulatory frameworks and the level of market maturity (Lee, 2020). Overall, in the absence of a high level of institutional commitment and stakeholder coordination, green finance runs the risk of becoming a set of symbolic gestures as opposed to instruments of transformation.

Thus, the aim of the study is to identify the potential role of green financing practice in facilitating sustainable development in the Irish context of socio-economic and environmental environment. Through a critical assessment of existing practices, policy frameworks and implementation obstacles, the study will seek to forecast viable avenues through which Ireland can better utilise green finance as a means of realising national and global sustainability goals. In this perspective, the study does not only add value to the academic discourse but also provides a practical implication to policymakers, investors, and other stakeholders on the environment.

1.2 Research problem

Green financing has become one of the leading highlights of the global quest to realize sustainable development and fight climate change. Green bonds, renewable energy financing, and green loans are among the instruments that have received wide recognition regarding their potential to ensure that financial flows are aligned to environmental goals. Nevertheless, regardless of this international accumulation of steam, there is still a significant deficiency of empirical studies which are investigating the particular role and effect of the practice of green financing within the context of sustainable development in Ireland. The available literature is more likely to be either concentrated on theoretical advantages or expanded to the regional or global scope, whereas the situation in Ireland remains insufficiently examined (Flammer, 2021; Maltais & Nykvist, 2020).

There is also the case with green loans. Information linked to the performance of green loans is usually uncollated or devoid of crucial environmental and social metrics to enable policymakers, financial institutions, and research organizations to determine their effects in

the real world (Climate Bonds, 2019). Such data gap also makes it more difficult to assess green loans as a feasible and sustainable financial tool to finance the sustainable transformation in Ireland.

Although at the policy level, there has been progress like the Irish government Sustainable Finance Roadmap and more institutions are trying to make the financial system green, not enough research has been done on how these financial instruments work in the particular market, regulatory, and environmental context of Ireland (Byrne, 2024). This has resulted in the fact that Ireland does not have a balanced view of the role of green finance in concrete achievement of the United Nations Sustainable Development Goals (SDGs) at the local level (OECD, 2020).

Besides, although green finance is starting to be viewed as a channel to achieve a sustainable economic transition, it is not well understood whether the application of these financial instruments has enabled the conversion of the theoretical potential into practical impact in Ireland. That highlights one of the key research gaps, namely the necessity of a context-dependent study that would go beyond exploring the implementation mechanics and challenges of green finance and assess how it actually affects the state of the environment and socio-economic development in Ireland. This gap needs to be addressed to guarantee that Ireland will be capable of utilizing green finance as an engine of sustainable development and fulfill its national and international climate commitments.

Research question

What is the role and impact of green financing practices on sustainable development in Ireland?

Main objective

To identify the role and impact of green financing practices on sustainable development in Ireland

Sub objectives

To identify the role of green bonds on sustainable development in Ireland

To identify the role of renewable energy financing on sustainable development in Ireland

To identify the role of green loans on sustainable development in Ireland

1.5 Significance of the study

The proposed research below is appropriate in helping to bridge this gap by providing insights on how the practice of green financing helps to advance the sustainable developmental agenda of Ireland. By examining the example of green bonds, renewable energy financing, and green loans, the research study is targeted at an overarching goal of developing an in-depth understanding of the circumstances under which the financial instruments can benefit the twin processes of environmental sustainability and economic development. The research can assist policy makers, the banking community and investors in ways in which they can utilize green finance to achieve long term sustainable objectives.

Besides, it is essential to determine the opportunities and gaps in Irish green finance to recommend actions to increase the application of financial products and spur the development of green investment. Even more, as Ireland continues its journey on climate change towards a more promising future of a sustainable Irish economy, further research on a topic that highlights the current obstacles and disadvantages will be crucial when identifying which policy changes can be deployed in Ireland to promote sustainable finance.

By synthesising the findings of the literature review and the empirical examination, the given paper will not only cover the gaps that exist in the knowledge regarding the impact of the green financing practices, but also provide an account of practical suggestions that can be utilised to enhance the performance of sustainable development in Ireland.

1.6 Scope of the study

The present study is aimed at assessing the role and importance of green financing practices in sustainable development in Ireland, especially three major financial instruments, which are green bonds, renewable energy financing and green loans. The span is thematic as well as geographical. Thematically, the research will delve into the use of these financial instruments in Ireland to promote the three pillars of sustainability namely environmental sustainability, economic resilience and social well being. It explores the direct and indirect impacts of green finance on some sustainable development indicators that include reduction of carbon emissions, adoption of clean energy, creation of green jobs and enhanced resource efficiency.

The research will offer a more practical insight into what role green finance plays in the realisation of the sustainability objectives in Ireland by analysing its practical application.

The geographical scope of the study is the Republic of Ireland because the country has a specific policy system, economic system, and financial ecosystem. The current events in sustainable finance in Ireland, including the Sustainable Finance Roadmap and Climate Action Plan, make it a topical case to study the role of green financial instruments that are developing in a high-income EU member state. Although the study relies on the global literature and good practices, its main scope is the way green finance is established, applied, and evaluated within the Irish context. This involves notifying the institutional, regulatory, and market-based facilitators and limitations that influence the prosperity of green financing ventures.

1.7 Limitations of the study

Even though the current study aims to present a valuable insight into the role and the impact of the green financing practices towards sustainable development in Ireland, there are a few limitations that need to be mentioned. To begin with, the study is limited to quantitative data which is obtained by administering a survey with close-ended questionnaires.

Secondly, the research adopts purposive sampling where 100 individuals are to be sampled in the professions related to finance, renewable energy, and sustainability. Though this will guarantee relevant expertise of the respondents, it can lead to selection bias and limit the generalisability of the results to the larger population or other industries that are indirectly impacted by green finance.

Also, the reliance of the study on self-reported data as measured by Likert-scale questionnaires opens up the possibility of response bias wherein participants will exaggerate their positive perceptions or tend to align themselves to socially desirable answering. The descriptive and regression analysis that will be performed using SPSS will make it possible to determine relationships and patterns, yet such analysis will not enable to definitively prove causality between green financing practices and sustainable development outcomes.

1.8 Chapter outline

Chapter 02 contains the literature review and it is very critical in its approach in analyzing the theoretical and empirical evidence on green finance and its relationship with sustainable development. It discusses green finance system development at the global and regional level with references to the recent academic and policy reports, covering green bonds, renewable energy financing, and green loans. The chapter establishes some essential themes and frameworks and the lack of research on Ireland in particular.

The 3rd chapter is main research question and it is the included What is the role and impact of green financing practices on sustainable development in Ireland? It also states the principal research purpose, which is to discover the role and influence of green financing practices on sustainable development in Ireland and three sub-purposes that examine the particular role of green bonds, renewable energy financing, and green loans.

The methodology chapter is the 4th chapter and it elaborates the design of the methodology that was used to attain the research objectives. In the chapter, the quantitative survey approach with close-ended questionnaires is explained, and the purposive sampling methodology, based on which 100 professionals working in Irish finance and sustainability sectors were selected, is outlined. It also discusses the data collection procedure including pilot testing and tools used in the analytical process such as use of SPSS in the determination of descriptive and inferential statistics including regression and correlation analysis.

The 5th chapter is findings and analysis chapter and it demonstrates the results of data analysis. The findings regarding each of the sub-objectives of the research are provided in a systematic manner, along with the determined correlations and relations between the green financing practices and the sustainable development indicators. The chapter analyzes the statistical results, which present a comprehensible image of the efficacy and place of green bonds, renewable energy financing, green loans in ensuring sustainability targets in Ireland.

The 6th chapter is the discussion chapter explains the findings with reference to what is already known or has been published, and critically discusses how the findings verify,

conflict or build upon what has been written or published before. It offers a consideration of what the green financing practices entail to the sustainable development policy of Ireland as well as investment plans and institutional arrangements.

The final chapter is the conclusion and recommendations chapter. The limitations of the study along with the future research directions are discussed in the conclusion chapter. Lastly, it ends with the conclusion and recommendation on the essential findings to provide policymakers, financial institutions, and stakeholders with effective actions that empower the role of green finance in supporting the sustainability agenda in Ireland.

Chapter 02- Literature review

2.1 Chapter Introduction

The chapter is a critical review of the available literature on green financing practices and how they contribute to expanding environmental, social, and economic sustainability measures, especially in the Irish environment. It then proceeds to discuss the general concept of sustainability and sustainable development in an effort to determine the theoretical connection between financial mechanisms and the results of sustainability. In addition, it indicates the differences in methodological and contextual studies of the current research particularly the poor empirical findings and country-level data in the Irish financial and policy environment. By means of critical and comparative synthesis of the literature, this chapter establishes the starting points of the present research by formulating certain knowledge gaps and putting them in line with the research objectives.

2.2 Theoretical review

2.2.1 Stakeholder theory

A major theory that underpins the current research on the role of green financing practices in sustainable development is the **Stakeholder Theory**. Originally proposed by Freeman (1984), this theory asserts that businesses and financial institutions have responsibilities not only to shareholders but also to a broad range of stakeholders, including the environment, society, and future generations. This perspective aligns closely with the ethos of green finance, which seeks to integrate environmental and social considerations into financial decision-making to achieve long-term sustainable outcomes. Several scholars have applied this theory in green finance research, highlighting how financial tools such as green bonds, renewable energy financing, and green loans serve the broader interests of stakeholders beyond profit maximization (Bhutta et al., 2022; Sachs et al., 2019). For instance, Dovidonis (2024) and Nguyen et al. (2022) emphasize that stakeholder-aligned financing strategies are vital for meeting sustainability goals, as they mobilize capital towards activities that mitigate environmental risks and promote inclusive growth. Furthermore, Belova et al. (2023) argue

that green lending decisions rooted in stakeholder-oriented governance frameworks can significantly influence environmental performance and accountability in both public and private sectors. In the Irish context, Byrne (2024) reinforces the stakeholder theory by indicating that financial decision-making is increasingly expected to serve climate action, social justice, and economic resilience agendas. Thus, stakeholder theory provides a robust conceptual lens for analyzing how green finance instruments are used by financial institutions and policymakers to balance diverse interests and advance sustainable development in Ireland.

2.3 Empirical review

2.3.1 Green Financing

Green financing has become one of the critical measures in alleviating the rising threat of climatic change and environment degradation. Altunina and Alieva (2021) discuss that green finance is associated with financing the right project by financing projects that bring environmental benefits, especially in energy efficiency, pollution control, and renewable energy development. They claim that systematic framework of green finance can be used to coordinate capital markets to meet the sustainability objectives. Nevertheless, green financing has not been standardised globally, and it is the lack of consistency that does not allow practitioners to take it to the full scale (Volz, 2018).

One of the key success stories in the green financing is the spread of green bonds all over the Earth. Dai and Chen (2023) demonstrate the role of green bond in the management of natural resources and SDGs achievement. Nevertheless, they also emphasise the insufficiencies in transparency, and the lack of harmonised reporting systems, which is also echoed by Sachs et al. (2019), who place special emphasis on the credibility which should be achieved through international governance. In the meantime, Nguyen et al. (2022) examine green financing in the cases of Vietnamese banks and stress the role of internal capacity-building and outside incentives in an efficient green lending process. This is opposed to Byrne (2024) who criticises the Irish green finance sector with its comparatively limited rate in mobilisation of capital regardless of high-quality policy structures.

ropean scenario, Dovidonis (2024) highlights the role of green finance in expanding the economy but advises against over-relying on market-based instruments which potentially push social equity out of the picture. On the same note, Fu, L and Pirabi (2023) posit that although green finance directs the funds towards sustainable projects, there has not been sufficient oversight of the effects of green finance on the biodiversity and climate resilience. Applying the same situation in China, Lee (2020) provides an example of how state intervention and public financing stimulated the development of green finance in the country. This is opposed to other less conservative economies such as that in Ireland where the market is highly involved with limited participation of the public-sector activities in the economy.

The study by Wang et al. (2022) has added empirical evidence to the results of a broad study in which the researchers offered evidence that green finance does lead to sustainable endings but with a caveat that the success of green finance is strongly preconditioned by the age of financial markets and regulatory frameworks. Similarly, Saleem, Khan and Mahdavian (2022) conclude that in Asian economies, the adoption of green technology, which is financed by green finance, enhances the quality of the environment only in case of strong governance.

In addition, green loans and other banking instruments are not used as much as the green bonds. The authors who explore the topic of green loans (Hunjra et al., 2023) emphasize that developing countries face the problem because commercial banks have no interest and technical provisions to issue green loans actively. This is supported by Zheng et al. (2021), who indicate that, the financial institutions in Bangladesh whose performance in sustainability is positively associated to the level and efficiency of green financial products.

2.3.2 Sustainability

Sustainability is the multidimensional concept, including the environmental, social as well as economic implications. Sachs et al. (2019) claim that the necessary improvement in achieving sustainability would imply both policy and financial systems changes. They suggest green finance as one of the important facilitators of sustainable transitions to a new economy. According to Al-Mukit and Hossain (2020), sustainability refers to the dynamic process that requires long-term commitment of all the sectors, including the one of finance. They think

that finance should go past its profit-making tendencies by incorporating an element of society and the environment.

The interconnection between financial structures and sustainability is complicated. In their article, Mahmood et al. (2024) articulate the assertion that sustainable infrastructure and green technological innovation should and can work as mediums of the accomplishment of the SDGs in the context of such ecosystems of projects as the Chinese Belt and Road. They show that their findings support the argument that finance should not be considered only as a facilitator of sustainability but of a driving force of sustainability. Conversely, Hoshen et al. (2017) lay out the idea of green finance in Bangladesh as an emerging phenomenon with significant potential but also an awareness level among different stakeholders and institutional drag.

This relationship (between ESG indicators and financial decision-making) has been highlighted by a number of researchers in this field. Yang et al. (2022) carry out a sectoral-based examination of the G7 countries, which indicates that the level of volatility in the green financing and clean energy investment directly influence ESG performance. In the same light, Xiong and Dai (2023) provide an insight into how the green finance investment, especially by the means of renewable energy contributes to technological innovation, which, in its turn, promotes sustainable development. Owing to these studies, it is possible to agree with the idea that green finance initiatives cannot be assessed in isolation of the tech and policy-based ecosystems.

With regard to the Irishy eliminated in the Irish context, Byrne (2024) states that even though significant developments have been made in sustainable finance structures, the translation of real environmental/social benefits is low. He states that, although Ireland has to date adopted sustainable finance as a strategic goal, Ireland is still experiencing implementation gaps, especially to mobilise private capital and to guarantee the coherence of regulations. It aligns with the study of Wang and Wang (2021), who noted that the true challenge of sustainability is whether the green finance will transform the industrial patterns and consumption models.

Regarding the scope, Fu, L, and Pirabi (2023) prefer to have a systemic perspective and outline connections between finance and the digital economy with sustainable development. They posit that green finance should manifest itself in digital innovation that can result in improved levels of transparency and efficiency however digital inequality gaps will

potentially increase inequality. An interesting example presented by Hailiang, Chau and Waqas (2023) is a case with China, and green finance positively affected the results of sustainability connected with the tourism industry. This exemplifies the potential of the green financing on a sector-specific level given the involvement of the policy integration.

Along with these nice trends, there are negative observers. According to Shen et al. (2013), green finance plans are not deep enough to be applied to most of the countries, and are commonly restricted to pilot experiments or policy schedules. This criticism is similar to one by Ronaldo and Suryanto (2022), who comment that in Indonesia fund villages, the challenge of green finance initiatives is poor institutional support and few stakeholder interactions. Institutional infrastructure cases are important to continued environmental and social benefits.

2.3.3 Role of Green Financing Practices on Sustainable Development

Innovative green financing practice is progressively being identified as an essential instrument in the development of sustainable investments. According to Sachs et al. (2019), the realization of the SDGs will not come without considerable mobilisation of green finance. They point out that green finance directly contributes towards achieving such things as clean energy, sustainable cities and climate action. Dai and Chen (2023) support this view and reveal that green financing mechanisms play a crucial role in the management of natural resources and in the development of the wider area, which includes poverty reduction and resilience strengthening.

In the case of China, according to Lee (2020), green finance has been put into wider use in national development planning, which has consequently contributed immensely to achievement of sustainability. This is compared to less centralised economies where the market forces are high and the implementation of green finance tends to be slow. Nguyen et al. (2022) illustrate that Vietnamese commercial banks have adjusted their green financing plans to the regional sustainability issues, indicating that localization is the key to success.

Byrne (2024) classifies and gives a full overview of the green finance system in Ireland and reveals that there is a disansonse between the policy level and the operational results. His argument is that although Ireland has institutional frameworks we have, there is no proper coordination of stakeholder involvement and also capital mobilisation. In the same token, according to Volz (2018), in most Asian states, the efficiency of green finance is predetermined by clear regulation, market incentives, and good private-public collaboration.

Mahmood et al. (2024) wish to suggest that the role of green finance in sustainable development is to be discussed in terms of innovation. According to their proposals, green financing may play a role in spearheading innovation in green infrastructure and technologies. Sharma et al. (2022) offer the same opinion, as the increased speed of renewable energy development can be achieved with the help of green financing, which becomes possible through the creation of the required enabling environment and risk mitigation tools.

Wang et al. (2022) add an empirical contribution to the body of knowledge by establishing a positive relationship between green finance and sustainable development indicators around the world. But they warn that such a relationship depends on quality of the governance, transparency, and financial literacy. This finding is supported by Saleem, Khan and Mahdavian (2022) who conclude that green finance by itself is not the only solution to sustainability in the future without the backdrop of a more comprehensive ecosystem of environmental regulation and social inclusion.

It is also interesting that the short comings of green financing towards sustainable development are of note. Hunjra et al. (2023) point out that the use of green finance is quite limited in most developing states, especially among small and medium-sized companies, as compliance with environmental standards has a significant cost and people are poorly informed. In the same vein, Al-Mukit and Hossain (2020) claim that green finance initiatives can never spread if there is no capacity building and awareness mobilization.

On a final note, although articles have been consistent with the using green financing as a means of enhancing sustainable development, they equally point towards the importance of contextual fit, institutional strength and coherent policy systems. The Irish example, which was represented by Byrne (2024), demonstrates the potential and the dangers of green finance in case structural and operational problems are not resolved properly. The literature forms the basis of extending any subsequent empirical study on how green finance can be streamlined

to address the heterogeneous objectives of sustainable development, especially at the national levels such as in Ireland where economic growth has been disproportionate.

2.3.4 Role of green bonds on sustainable development

Green bonds have been found to be a very important financial tool to overcome the investment gap in the projects of sustainable development. According to Alamgir and Cheng (2023), green bonds are no longer a symbolic measure and now constitute a veritable fantastic support for environment-friendly projects. They argue that the projects funded through green bonds improve transparency and accountability since the proceeds are marked to sustainable purposes due to which they boost confidence among investors. Nevertheless, there is still a problem regarding standardisation since different definitions given to green in various jurisdictions take away their impact and validity.

Bhutta et al. (2022) give a detailed overview of the development of green bonds and mention that they have grown considerably in number over the years and especially since the Paris Agreement, however, the actual environmental effect that green bonds are having remains unclear. They emphasize that the market interest tends to go ahead of regulator scrutiny, which presents an opportunity to greenwash. The same issue is also raised by Weber and Saravade (2019), who indicate that so-called green bonds should be implemented by the stricter monitoring systems and uniform disclosure standards in order to effectively promote the sustainability development goals (SDGs).

Caliari (2024) presents green bonds as potential means of SDGs achievement, stating that they could be used to facilitate the development of green energy, sustainable buildings and structures, and climate resilience processes. She however points out that there is a mismatch in financing where even though the green bonds are sometimes utilized in capital intensive and long term investments, many of the SDG investments are short term and at the local level. Distribution of green bonds should therefore be reformulated with an eye to being inclusive and fair in sustainable growth.

The sovereign angle of green bonds has a lot to say as well. Doronzo, Siracusa and Antonelli (2021) examine the issuance of sovereign green bonds and arrive at the conclusion that governments issue sovereign green bonds to signal to the world that they are committed to environmental sustainability and that they attract conscionable investors. Nevertheless, in

their study, it is also appropriate to note that political and administrative inhibition encountered by sovereign issuers tend to undermine prompt deployment of funds. This is contrary to swiftness of the private sector in issuance and implementation of the projects supported by green bonds.

In their article, Jolovic, Sinoi and Focaracci (2025) focus on green, social and sustainability bonds in European nations and propose that the national policy frameworks, the demand of investors and the quality of institutions are the major factors of green, social and sustainability bonds issuance. According to their findings, the use of green bond in terms of credibility and uptake can be further improved with strong legal systems implemented, alongside the use of green finance roadmaps, thereby becoming a significant contributor to sustainable development.

Kedia and Joshipura (2022) explore the channels and the direction of green bonds which should be innovative methods of bond structuring and thematic diversification. They say that the future growth will require socialising of green finance so that it makes sustainability to be more holistic instead of being obsessed with environmental measures. This coincides with the correspondence in the advancements of Nikolaj, Draženović and Buterin (2022), which identifies the potential use of green bond financing in promoting recovery strategies after the COVID crisis, particularly by achieving resilient, green and digitalised economies.

The other way in which the effectiveness of green bonds can be noted is through stock market reaction to announcements of green bonds. Laborda and SInchez-Guerra (2021) study the European stock markets and observe more positive market reaction which implies the optimism of investors in the economic feasibility of green-financed businesses and their ethical standings. Yet, they also warn that these responses are not constant and, in fact, they vary depending on the level and the open-endedness of the green bond issuance.

According to Maino (2022), green bonds are critical in the process of financing the energy transition, particularly by supporting large-scale projects at renewable energies. According to his analysis, green bonds do not only reduce the capital costs of an organization, they also increase the diversification of funds, yet they are not frequently available to small or emerging market participants, due to high compliance burdens. Thus, measures and technical assistance to strengthen capacities should be offered in the growth of the green bond markets.

Tolliver, Keeley and Managi (2019; 2020) investigate the compatibility of green bond issuance with climate goals and policy plans. They demonstrate that there is a more linear connection between green bond finance and environmental performance in the countries that

have transparent climate objectives and policies. Their publication confirms the potential of green bonds in helping achieve the SDG-relevant performance, but it demands the increased climate science incorporation into various financial decisions.

Wang and Taghizadeh-Hesary (2023) shift their talk to the aspect of policy integration and note that the green bond markets should be complementary to the strategy of renewable energy on the national level in order to promote decarbonization. They offer empirical study showing that those nations whose fiscal stance, environmental policy, and monetary policy are consistent have greater green bond investment as well as better outcomes in clean energy production. Similarly, Wyszkowska and Filipiak (2024) come to an accurate conclusion that green bonds have the capability to fast track development to SDGs, given that they are supplemented by a multi-stakeholder outcome and institutional transparency.

Finally, Zhao et al. (2022) write about green bonds to green economic recovery after a pandemic. In their study we are able to see how green bonds have been used to fund energy-efficient technologies as well as retrofitting programs that on the one hand save emissions and on the other hand provide jobs. This added value makes green bonds more attractive to consider as more than environmental asset products but also as socio-economically resilient instruments.

2.3.5 Role of renewable energy financing on sustainable development

The funding of renewable energy has been shown to be a pillar in the promotion of sustainable development, especially in the case of the developed economy like Ireland. Byrne (2024) also suggests that Ireland has been cohesively matching its climate goals with financial tools that will promote transition to renewable energy. Such coincidence is important as in Ireland too, the history of fossil fuel use is very high and the country needs to gain speed in achieving the EU 2030 and 2050 climate goals. Commenting on the importance of a unified policy on national sustainable finance strategies and clean energy investment flows, Byrne points to renewable energy financing as a necessary factor in reflecting the full extent of the green potential of the country she is referring to.

The links between investment in renewable energy and sustainable development have been well established on the larger European level. Their paper by Boraawski et al. (2022) notes that investing instruments have been a significant factor in the growth of clean energy in the

EU and particularly in areas where a combination of public-private involvement and structural funds have proved beneficial. They claim that effective policies and economic incentives have yielded quantifiable results like decrease in emission of greenhouse gases and energy poverty. The conclusions of this research give comparative implications of the relatively decent performance of Ireland in the development of clean energy.

The renewable potential of Ireland, especially the wind and the solar power, has already been examined in the previous researches by Rourke et al. (2009) who not only provide the overview of the strengths of the renewable energy framework in Ireland but also indicate the weaknesses of the infrastructure. Although there is a lot to work with, Rourke et al. emphasize that the advancement has not been even because of the lack of financing and issues related to grid integration. They are supported by the findings of Connolly et al. (2011) who argue that there should be the development of a 100 percent renewable system of energy in Ireland. They pose a scenario analysis that emphasises on the necessity of substantial and prolonged investment in renewable technologies with very strong financing and legislation.

Regarding international trends, Bei and Wang (2023) base their findings on empirical evidence in several regions of the world and note that green finance, and, specifically, investment in renewable energy, has a positive correlation with a variety of SDGs, such as affordable clean energy, climate action, and economic growth. Although green finance contributes to environmental sustainability, socio-economic development is dependent on the financial governance levels and institutional backing. The authors indicate that due to the positive responses associated with green finance, institutional and financial governance should cast off the below-par performance driven by financial support. This argument comes in handy in resonating with the current discourses in Ireland on the necessity to tighten its regulatory control on green project financing in Ireland.

Development Financing Institutions (DFIs) as a catalysts in the renewable energy transitions is under study through the development financing lens by Xu and Gallagher (2022). Even though they are researching into the world of emerging markets, the values they promote like the long-term commitment of capital, risk reduction, and concessionary lending, apply in the same degree to the domestic environment of Ireland where numerous small-to-medium renewable developers previously found restrictions on capital access. They can advise Ireland with regard to the renewal of their public financial establishments including the Strategic Banking Corporation of Ireland (SBCI) for directed green finance.

Sen and Ganguly (2017) indicate the financial risk, lack of awareness, and institutional inertia as some of the frequent barriers to renewable energy development through a thematic analysis. Such reasons are also widespread in Ireland, where project rollout has been hampered by bureaucratic delays as well as planning permissions. Their results build on those presented by Horky and Fidrmuc (2024) who note that the development stage of finances is a primary influence in the uptake of renewable energy. This means Ireland has to develop its green finance eco-system, e.g., financial literacy and institutional coordination and fertilization of capital markets to boost green energy roll-out.

Guney (2019) addresses the questions of relations between non-renewable and renewable energy sources and determines that the nationwide shift towards clean energy cannot be performed only through financing but also the structural transformation of the system of national energy policies. In the case of Ireland, it implies that in addition to financing renewable projects, it is also necessary to simultaneously eliminate the fossil fuel subsidies and maintain just transition efforts. The assertion is consistent with Wldarczyk et al. (2021), which evaluate the indices of sustainable development in EU countries and conclude that the more renewable energy investments, the better the performance in terms of sustainability.

Evaluations at the Ireland-specific level are comparatively few, however, some comparative studies of the role of EU structural funds in funding renewable projects can be seen in Streimikiene, Klevas and Bubeliene (2007) highlighting the importance of the assistance of renewable projects through EU structural funds in the newer member states. These results indicate that Ireland in its turn can also improve the utilization of the EU green funding, given that it introduces a more transparent and results-based model of the funding allocation. Likewise, Siemiątkowski et al. (2020) disclose that improved environmental indicators can be found in the regions of increased finance turnover in the field of renewables, which means that the direct financing policies can play a crucial role in terms of predetermined regional sustainability in Ireland.

Considering the experience of China in the integration of green finance and renewable energy targets, Zhou and Li (2022) specify that financing directly contributes to technological innovation and scale. Even though the state-based model of China and the market based model of Ireland are different, the focus on innovation financing is something quite applicable. Such models can inspire Ireland as the state can invest into clean energy research and development, especially offshore wind and bio energy.

Lastly, Falchetta et al. (2024) mention the agriculture and renewable energy intersection in rural development, which can have some interest to the largely agrarian Irish economy. According to their studies renewable energy capital may improve the lives of the rural population, improve energy competence, and helps in minimizing environmental destruction.

2.3.6 Role of green loans on sustainable development

Green loans have become quite an important tool in the wider scope of green finance in fostering sustainable development goals (SDGs). Applying the notion to Ireland, Byrne (2024) observes that green bonds and renewable energy funding tools are not the only forms of green finance that have gained the bulk of policy attention; green loans are a more convenient and loose source of funding financial instrument, especially to the small and middle-sized enterprises (SMEs) and local communities, which seek to impose environmentally sustainable practices in their ranks. The fact that green loans are relatively underdeveloped on the Irish market demonstrates the necessity of further exploring the potential of green loans in terms of filling the financing gap as far as eco-friendly projects are concerned.

According to Belova et al. (2023), green lending may play a key role in supporting environmental projects where more traditional sources of investment capital may be unwilling to invest because of the perceived risk or longer-term investment horizon. To illustrate how green loans may work, in respect to Ireland, green loans have the potential to fill the gap between the institutional large financing and the green projects of a decentralized or grass-root level. The researchers confirm this viewpoint (Gulzhan et al., 2023) by highlighting that green loans provide a broader funding opportunity to finance relatively smaller-scale renewable energy, energy-efficiency retrofitting, and sustainable agriculture activities, which is paramount to the Irish environmental goals.

Dovidonis (2024) places green loans in the European Union scheme of green finance, which states that the results become more balanced and distributed with sustainable development outcomes reported across the nations with a well-developed policy of green loans. Nonetheless, Ireland has an infant green lending framework that does not have standardized guidelines or clarity of regulation, and this can hamper its capability to attract local and international funds. This issue echoes the conclusions of Nguyen et al. (2022) who examined

the potential of Vietnamese banks and concluded that the provision of green loans was successful because of institutional capacity and definite environmental impact assessment.

With a global comparative outlook, Hunjra et al. (2023) point out the potential to use green finance mechanisms, notably green loans, to reduce environmental degradation but also to facilitate economic resilience. Their experience of developing economies indicates that green loan products can be appropriately constructed to amplify the social and economic components of sustainability, which includes employment, and local innovativeness, which also applies in rural and peri-urban communities in Ireland. Therefore, the use of such mechanisms in Ireland does not only demand financial innovativeness but it must be coordinated in policies as well, to achieve socially inclusive results.

Baloch, Khan and Ulucak (2023) also fix the connection between the financing of renewable energy and its contribution to a holistic sustainable development as it is claimed that the so-called green loans focused on project financing in the energy sector can lead to cross-sectoral spillovers, such as health and ecosystem-related positive outcomes. Green loans can be developed to facilitate integrated sustainability programs in Ireland, where community energy projects and local authority climate action project are developing. Nevertheless, as is described by Sachs et al. (2019), the realization of such synergies relies on matching the loan conditions to environmental objectives as well as SDG-consistent performance indicators.

The case study designed by Pyka and Noco (2021), regarding the energy industry in Poland, shows that responsible lending policies play a vital role in achieving a sustainable path since the funding of green loans can actually stimulate the process of sustainability without being considered a greenwashing instrument. In the case of Ireland, this requires a subsequent robust verification and reporting structure that does not merely assess the environmental compliance of the projects being funded, but also review how it contributes to the Irish Climate Action Plan and the wider SDG commitments. Another important aspect of the discussion about green loans is connected to the topic of financial risk. Tommaso, Pacelli and Povia (2025) analyze relationships between green lending and risks exposure of banks in their establishments concluding that green loans are not always less risky because they are strategically aligned to support long-term regulation targets, banks are still vulnerable to risks relating to the delivery of their projects and technological uncertainties. Clearer risk assessment models and incentives are thus required to drive the scale-up in green lending by the banks in Ireland without jeopardizing their financial stability.

The green loan loss provisioning system has been a new aspect in this discussion, where Ozili (2023) proposes a system that will encourage banks to incorporate environmental risk in financial reporting. This would be a revolutionary means in the Irish context where green loans are still on the periphery partly because green loans have not gained favorable accounting and prudential regulation. The financial institutions in Ireland by embracing environmental risk explicitly would create a green finance portfolio that would be more resilient.

In a more technologically and futuristic approach, Omri, Hamza and Slimani (2025) consider green loans leading in creating synergies between the deployment of renewable energy and in sustainability innovations, which are promoted using AI. Even though Ireland is still in the initial phase when it comes to utilizing such high-tech integrations, their findings indicate that the design of green loan tools need to change to assist green emerging sectors, which include green data infrastructure, electric mobility, and smart grids.

Lastly is the empirical confirmation of how green loans can help increase economic sustainability and environmental performance by project-based funding, which Niyazbekova et al. (2024) addressed. According to them, the projects that are financed with green loans tend to be more in line with the environmental standards, and they are usually able to bring sustainability to the regions that huge financing cannot. In Ireland, this confirms the opportunities of green loans to supplement national-level initiatives, therefore, focusing on small-scale, high-impact opportunities, like retrofitting of public buildings, funding green startups, and encouraging eco-tourism.

2.4 Research gap

2.4.1 Literature gaps

There is still a gap in the literature, that is, with a surge in knowledge about green financing and its role in sustainable development, and more specifically in Ireland. Although the study on the connection between green finance and sustainability has previously been conducted in a global or regional level (Wang et al., 2022; Sachs et al., 2019), little research has been done on how a green bond, green loan, and renewable energy financing can help achieve the Irish sustainability objectives at a national level (Byrne, 2024). Past work has largely been explorative or theoretical and not necessarily has these findings been the basis of deployment

of empirical data on how green finance works in the Irish policy and financial environment. This marks a significant knowledge gap in the scientific knowledge regarding quantifiable consequences and practical difficulties of implementing green financing on a national scale.

In addition, the available body of literature has tended to view green finance using macroeconomic frameworks and has in most cases focused on the development of policies or the expansion of capital markets (Fu et al., 2023; Lee, 2020). Nevertheless, these studies seldom discuss the local implications of green finance, especially its implication on small and medium enterprises (SMEs), community energy schemes, or public sector schemes, which provide the backbone of the sustainability transition in Ireland. Such contextual blindness generates a gap in knowledge regarding the potential of green financing instruments to facilitate Ireland to develop the Climate Action Plan or to attain the Sustainable Development Goals (SDGs).

2.4.2 Methodological Gaps

Methodologically, most previous literature has used quality or thought frameworks, using case studies or policy reports without utilizing empirical confirmation on an objective basis (Bhutta et al., 2022; Nguyen et al., 2022). Although such approaches can be used to explore theories, they are sometimes unable to present any powerful evidence of causality and are at fault in presenting the statistical importance of green finance effects. Larger research in the form of quantitative analysis based on a structured tool of data collection like a survey or an econometric analysis is lacking, which constrains the possibility of generalizing the research or drawing policy advice based on the data. As an example, Nguyen et al. (2022) introduced valuable insights by Vietnamese commercial banks, but the research method does not enable cross-sectoral comparison, and cross-national or cross-sectoral comparison, as well as isolation of the particular effects of various financing instruments is to be ignored.

Moreover, most previous research has used a one-dimensional perspective to analyze green finance based on environmental performances without paying attention to the multidimensional aspects of sustainable development which comprises social and economic aspects (Dai & Chen, 2023; Zhou & Li, 2022). Greater research is required to examine the wider effects of green finance on job creation, poverty alleviation, as well as community sideline competency, fields that particularly apply to the Irish socio-economic context.

2.4.3 Contextual Gaps

Another significant context setting is the dearth of Ireland-specific research on the effectiveness and implementation of green financing tools. EU-level strategies and frameworks are present (Dovidonis, 2024) but there is little empirical evidence regarding how the policies are implemented in the Irish, regulatory, economic, and cultural context. The problem of insufficient interest of the investors in Irish green bonds (Caliari, 2024), regulatory barriers in renewable energy projects financing (Connolly et al., 2011), and the lack of consistency in green loans practices (Byrne, 2024), was less studied. Existing literature tends to assume that the use of green finance instruments is similarly applicable to other regions, despite the presence of the barriers in the administrative environment, regional governance, and awareness issues that Ireland faces differently than the rest of the EU countries, focusing on that country.

Moreover, the literature fails to sufficiently comment on how green finance can relate with the strategies of decentralization in energy, agriculture, and infrastructure by Ireland. As an illustration, although renewable energy programs in communities have been increasing, little research has been done on the upscaling and sustainability funding mechanisms (Strachan et al., 2015). Likewise, the contextual vacuum is characterized by the absence of research that puts an exclusive emphasis on the concept of behavioral and institutional readiness, which includes public awareness/financial literacy/institutional capacity.

2.5 Chapter Conclusion

Although there exists evidence internationally that there exist positive correlations between green finance and sustainability performance, little comprehensive evidence is understood on how such correlations exist within the context of Ireland with respect to its unique situational socio-economic and regulatory framework. The review shows that theoretical studies concentrated on the theoretical modeling or looked at some practices of green finance on specific European or Asian levels but did not concentrate on the specifics of the mechanisms, challenges, and effects that are peculiar to Ireland. Also the findings cannot possibly be used in real life policy and investment decisions due to methodological limitations such as an over-dependence on qualitative ideas and the absence of large-scale quantitative research. The above insights not only legitimize the relevance of the present study but also shape the

research methodology design and the creation of a conceptual framework in the following chapters.

Chapter 03- Research question

3.1 Main question

The following broad research question attempts to understand how the different green financing instruments can be used to promote sustainable growth in the Irish setting. Green financing is taking its place as one of the most critical means of solving the environmental crisis within the framework of stimulating economic progress (Sachs et al., 2019). The literature available findings indicate that the application of green finance has had a beneficial impact on the sustainable development goals in other parts of the world (Wang & Taghizadeh-Hesary, 2023), but their impacts in Ireland are lacking considerably to the rest of the world. Although Byrne (2024) also mentions the significance of sustainable finance in Ireland and the necessity to achieve the climate promises in the country of concern, the lack of overall empirical studies merging several green financing tools and instruments in such a context stands out. Such a question, thus, responds to the necessity to examine not only each of the green financial tools but their overall influence on the path of sustainable development in Ireland, which replaces a fundamental gap of putting global results in the context of the Irish policy and economic aspects.

What is the role and impact of green financing practices on sustainable development in Ireland?

3.2 Sub questions

Green bonds have been identified as one of the tools of financing projects that are beneficial to the environment and are associated with achievement of goals on sustainable developments (Alamgir & Cheng, 2023). The green bond issuance throughout the world has funded renewable energy, energy efficiency, climate resilience measures (Bhutta et al., 2022). Nevertheless, the international literature is saturated with information on the success of green bonds whereas research that targets the situation in the Irish market is relatively small. Caliari (2024) adds that the adoption of green bonds and their impact differ by a lot across countries in Europe, which is an indication that countries have unique factors that influence their adoption. The research question will seek to address the lack of locally

specific evidence on the topic of Irish experience in green bond and evaluate the role of green bonds in the context of sustainable development in Ireland, where the financial and regulatory environment are specific to the Irish story.

What is the role of green bonds on sustainable development in Ireland?

Providing finances to renewable energy is one of the key factors in the shift towards the phaseout of fossil fuels and the growing use of cleaner sources of energy, which directly affects sustainable development, causing a decline in carbon emissions and encouraging energy security (Boraski et al., 2022; Rourke et al., 2009). Because of the financial mechanisms favoring the deployment of renewable energy, studies have shown that it causes the positive change in the environment-related and economic-related indicators measure in the change (Bei & Wang, 2023). The ambitious renewable energy targets set in Ireland demand a keen assignment on how financing assists these overambitious targets, but what is noticeable in the literature is a gap about the empirical studies that can quantify the achievement of renewable energy financing in Ireland (Byrne, 2024). This question also explores this gap by ascertaining how renewable energy financing has specifically contributed to sustainable development outcomes in Ireland thereby dispensing with larger body of knowledge on how financial support mechanisms are applied and their practical consequences within Irish context.

What is the role of renewable energy financing on sustainable development in Ireland?

Green loans represent a relatively novel kind of green finance that is meant to finance projects and projects with positive environmental effects, including upgraded energy efficiency and sustainable infrastructure (Belova et al., 2023; Gulzhan et al., 2023). Although the possibility of green loans in facilitating sustainable development is already widely acknowledged in the international literature (Hunjra et al., 2023), very little research exists that could specifically analyse green loan uptake and effect at the national level, in Ireland, in particular. According to Byrne (2024), green lending by the Irish financial institutions is slowly being normalized and yet systematic empirical evaluation of effectiveness in facilitating sustainable growth is scanty. This inquiry will thus meet this gap, since the research question aims to examine the impact of green loans on the sustainability outcomes in

Ireland to prove the practical nature of these initiatives and highlight the opportunity to make their profile stronger in the Irish context.

What is the role of green loans on sustainable development in Ireland?

3.3 Main objective

To identify the role and impact of green financing practices on sustainable development in Ireland

3.4 Sub objectives

To identify the role of green bonds on sustainable development in Ireland

To identify the role of renewable energy financing on sustainable development in Ireland

To identify the role of green loans on sustainable development in Ireland

Chapter 04- Research Methodology

4.1 Chapter introduction

This chapter presents the methodology framework observed in the research to examine how green financing practices can be used to ease developmental sustainability in Ireland. There was also careful consideration of ethical considerations that enabled me to protect the participants and maintain integrity in the research work.

4.2 Conceptual framework

The study is supported by a conceptual framework (Figure 1) that illustrates the key variables and their interrelationships.

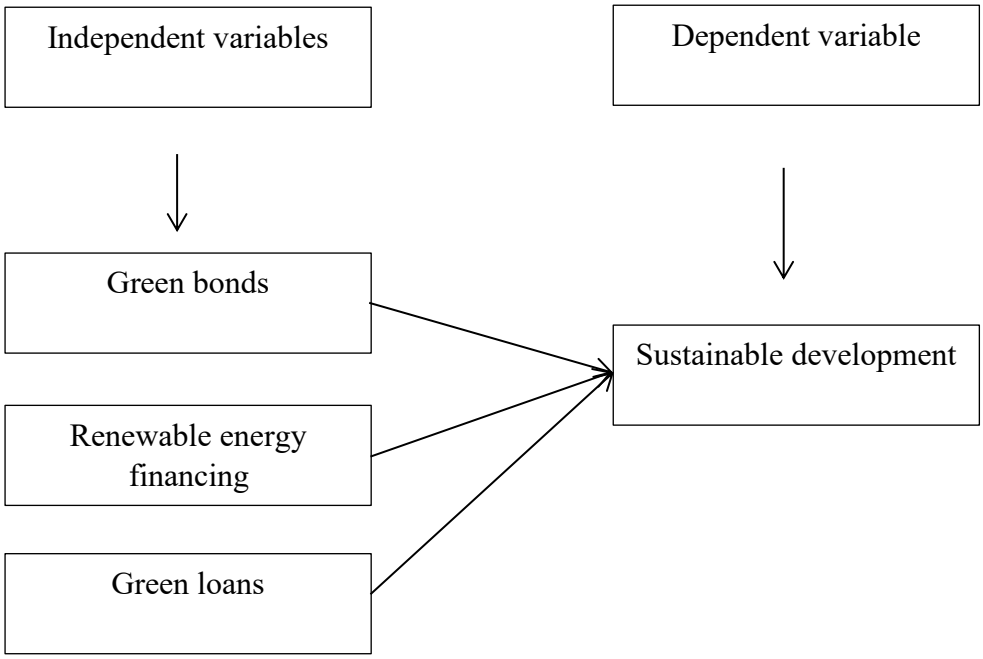

Figure 1- Conceptual framework

4.3 Hypotheses of the study

$H_1$1: There is a significant positive effect of green bonds on sustainable development

$H_0$1: There is no significant positive effect of green bonds on sustainable development

$H_1$2: There is a significant positive effect of renewable energy financing on sustainable development

$H_0$2: There is no significant positive effect of renewable energy financing on sustainable development

$H_1$3: There is a significant positive effect of green loans on sustainable development

$H_0$3: There is no significant positive effect of green loans on sustainable development

4.4 Research design

The Research Onion model (Figure 2) guided the overall research design, covering philosophy, methodology, and data collection procedures.

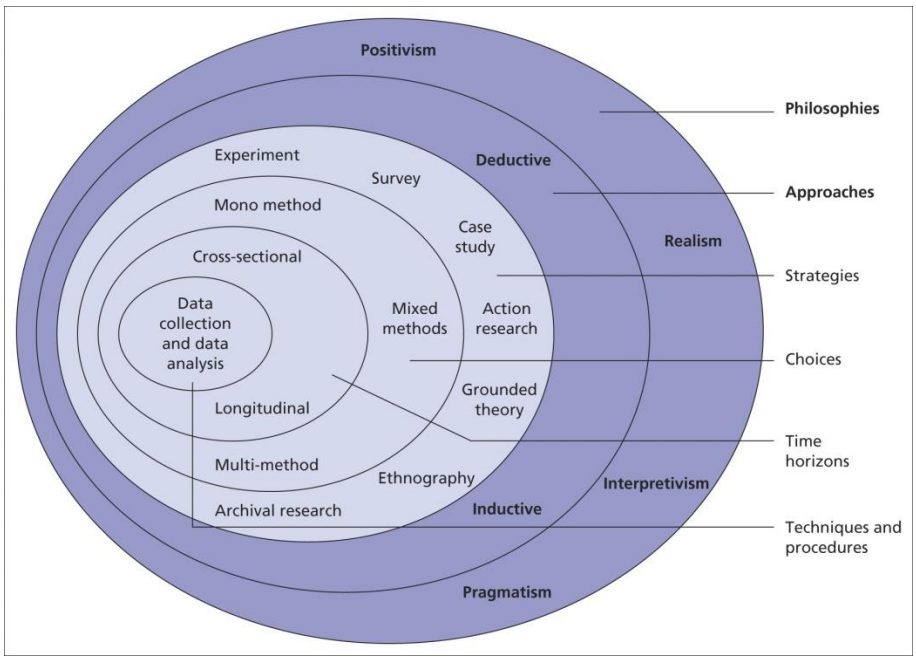

Figure 2- Research onion model

Source: (Saunders et al., 2019)

4.4.1 Research philosophy

The research philosophy is a system of beliefs that acts as a driving force in interpreting and developing the knowledge in the research. Positivism and interpretivism are the two main philosophical stands (Saunders et al., 2019). Positivism is a theory of knowledge according to which the truth is objective and may be projected and determined through empirical investigations, which often imply simple measurements and statistical data. Interpretivism, on the other hand, supposes that the world is socially built and subjective and is thereby concerned with making meaning of human experiences by using qualitative methods (Creswell, 2014). In this study, the positivist philosophy will be used because the researcher will be able to objectively study how green financing practices, which include green bonds, renewable sources of energy financing, and green loans, correlate to measurable indicators of sustainable development in Ireland. This design is helpful in hypothesis testing with quantitatively measurable variables and attempts to define patterns and relationships on a general scale. The positivist selection can be informed by the nature of the research that intends to generate statistically proper and general research output that pertains to policymakers and financial stakeholders (Bryman, 2016).

4.4.2 Research approach

The research method informs the development, testing of theories and hypotheses. Deductive and inductive are the two major ones (Saunders et al., 2019). A deductive reasoning begins with already formulated theories or hypotheses, which is then tested by using empirical data collection, which is common in quantitative research. On the contrary, an inductive approach follows observations and data in a bid to come up with new theories and research, most often qualitatively explored. The study takes a deductive approach because it tries to prove the available theory about the topic of green finance and sustainable development by hypothesizing findings and testing with the aid of survey data obtained. Such a methodology is also the most appropriate to positive studies, and it is possible to organize an adequate analysis of the effects of different green financing practices on sustainability results (Creswell, 2014). Through deductive logic, the paper aims to prove or disprove of theoretical assumptions in Ireland and measure the intensity of those associations.

4.4.3 Research strategy

The research strategy is a plan of conducting the research and collecting the data. Typical methods are: case studies, ethnographies, experiments, grounded theory, and surveys (Saunders et al., 2019). In this research case, the survey strategy will be adopted as the most suitable method. Surveys are also useful to collect the quantitative responses on a macro scale of a heterogeneous population, and this is especially useful in revealing the patterns, behaviors, and perceptions (Bell, Harley and Bryman, 2022). This plan is optimal considering that the objective of the study is to obtain perspectives of a wide scope of Irish-based professional individuals on the impacts of green finance on sustainable development. Although a research design such as a case study may offer more insight in a situation, in most situations, they fail to realize the scope necessary to generalize such findings. Survey method, in its turn, assures the research of a broad sample, which allows statistical analysis and further enhances its reliability and generalization of the results.

4.4.4 Research method

The methods of research are the procedures for collecting and the analysis of the data. The principal ones are quantitative, qualitative, and mixed techniques (Bell, Harley and Bryman, 2022). Quantitative technique is based on measurements and statistical analysis to help in testing hypotheses and researching the connection between variables. Qualitative methods on the other hand, look deeper into the narrative data obtained by conducting interviews, focus groups, and observations, and would be better suited to investigate meanings, motivations, and subjective experiences. Mixed method finds the use of the combination of both methods in order to bring a more inclusive answer (Saunders et al., 2019). In this study, the method used is quantitative, just as the study fits its positivist philosophy and method, deductive. The fact that the structured questionnaires, as well as Likert scale responses, make it easier to collect measurable data is also of importance because it will make it possible to statistically analyze the data using the methods of regression and correlation. The given approach can be used to test the relationship between various instruments of green finance and sustainability indicators and to make generalizable conclusions on how it works in Ireland. Though they

would allow probing deeper into individual views, qualitative methods were disadvantaged in the sense of testing the national hypothesis.

4.5 Population, sample size and sampling technique

The population involves financial analysts, managers working in the energy market, sustainability advisors, and government policy advisors, either directly involved in or influencing the application and implementation of green financing instruments, including green bonds, renewable energy finance loans, and sustainability-oriented financial initiatives. These are believed to be the most informed and beneficial people when it comes to delivering proper, relevant and meaningful data to this research.

Based on this number of people, 100 professionals will be sampled to take part in this research. This sample size is arrived at due to the necessity of finding enough level of statistical power on which this study can do quantitative analysis and at the same time be within the manageability objectives of the study. The sample will also seek to cover multiple views on different sides of the finance sector, energy companies and policymaking communities in Ireland so as to cover all the requisite differences in opinions and experience when it comes to green finance and sustainable growth. These participants will be selected based on having a direct experience with environmental or finance-related guidelines and projects; in this way, they will provide the information they perceive to be most relevant to the study's goals.

In order to find these individuals, a non-probability approach will be used during the research, the purposive sampling method, where the research participants are identified based on characteristics, qualifications or expertise on the specific matter of the research. Such an approach is particularly appropriate in research that demands special expertise and where random sampling may end up covering those who do not have the required understanding of the research problem. Responding to the functions of the purposive sample consideration, the originality and credibility of the gathered personal information are increased since the interviewed persons work directly with the green finance practices and sustainable development program efforts. Despite the fact that this approach restricts generalizability to the general population, such kind of sampling is appropriate in the study based on the fact

that it focuses on expert knowledge and informed opinions that are important to provide answers to the research questions.

4.6 Data collection method

The data collection process of the study would entail administering a structured, closed ended questionnaire that would collect quantitative data regarding the perception and effects of green tools financing i.e. green bonds, renewable energy financing and green loans on sustainable development in Ireland. This procedure is consistent with the positivist ideology of the study and the deductive nature of the research performed, which leads to the possibility of gathering standardized information, which may be statistically analyzed. In the questionnaire, the responses on the attitude of the respondents on either agreement or disagreement with different statements with regard to the effectiveness, accessibility, and challenges of green finance instruments will be mainly measured using a five-point likert scale. The format is clear, consistent, and easily analyzed and allows the respondents to state a detailed opinion about particular issues of green financing. Questionnaire will be conducted along with the thorough analysis of the existing literature and the survey instruments used in the previous studies devoted to the issues of green finance and sustainable development. In order to enhance validity and reliability, a pilot test of the survey will be conducted using 10 professionals in the concerned industries. Their responses will be used to clarify vague ones, make them clear and definite that the questions given to the research are relevant to that research. This pilot will help in detecting any problem that may be involved prior to the complete implementation of the questionnaire, thus improving the general quality of the data gathering process.

4.7 Data analysis method

In order to interpret the results obtained by means of the questionnaire, in this study quantitative methods of data analysis will be utilized with the help of SPSS (Statistical Package for the Social Sciences) software. This instrument will make it easier to organize, code and analyze responses to reveal useful patterns and associations in the data. Descriptive statistics in terms of means, frequencies, and standard deviations will be presented as the

initial stage of the analysis to give a general picture of the opinion of the respondents regarding their perception of green financing activities like green bonds, renewable financing, and green loans. There is also the reliability analysis which the study will follow (e.g., the Cronbach Alpha) to determine the internal consistency of measure scales adopted in the questionnaire. Regression analysis will be conducted in order to study the correlation between green financing instruments and indicators of the green development. Besides, Pearson correlation test will be employed to test the strength and direction of relationship between variables in aid of ascertaining the existence and magnitude of associations between variables to determine how and whether various practices of green finance plays in the achievement of sustainable development goals. Such statistical methods will go well in helping test the research hypotheses and also give the study its empirical evidence.

4.8 Ethical considerations

The main aspect in this research procedure will be the nature of ethical integrity. Before the data collection is conducted, the organizational ethical clearance will be achieved by filling and submitting the Human Participants Ethical Review Application Form. Full participation in the study is voluntary and no one shall be forced or expected to participate. The subjects will receive all the necessary information about the objective, boundaries, and methodology of the research and will be put under oath by the signature on the proper consent form that they are willing to take part in the research. Strict measures will be taken to address any aspect of anonymity and confidentiality to make sure that the rights of the participants are preserved. Individual identities will also not be captured, and the data will be stored safely with the view of being used only academically. The reportings of findings shall be on an aggregated basis to eliminate the identification of the participants. These are ethical practices following normal research guides and which are aimed at engendering trusts, safeguarding the welfare of the participants in the research and to guarantee the validity of the research findings.

4.9 Chapter summary

Overall, in this chapter, the research design and methodological decisions, which informed the study, have been presented such as the way of implementation of positivist philosophy, the use of a deductive approach, and a quantitative method with a survey strategy. The decision to use each of the methods has been justified on the basis of the nature of the research objectives. The population and sampling meanings included devoting the relevant population to the professionals involved in finance and sustainability in Ireland because they were chosen by the purposive sampling in terms of relevant specialists to the topic. A structured and closed-ended questionnaire was used in data collection and analysis of the data by using the best statistical analysis methods with SPSS. Lastly, the chapter also reinstated the ethical research concepts that the study adhered to, whereby it included the voluntary aspect of the participation, informed consent and the confidentiality of the data. The approach provides the research with reliability, validity, and objectivity of the scientific results.

Chapter 05- Findings and Analysis

5.1 Chapter Introduction

This chapter shows the interpretation of the data gathered to see the connection between the independent variables, namely the Green Bonds (GB), Renewable Energy Financing (REF), and Green Loans (GL), and the dependent variable, Sustainable Development (SD). This is an aim to explain the statistical results in the form of the regression model and the strength, sense, and significance of every connection. The analysis itself starts with the description of the model fit overall, continues to testing the hypothesis via ANOVA, and continues to a detailed explanation of the coefficients. The careful assessment of these findings, therefore, enables empirical evidence to formulate how each factor can lead or contribute to sustainable development, which further helps ascertain the contribution that the use of green financing instruments and the adoption of renewable energy play in achieving sustainability. The results are explained in connection with the research questions and justified by the appropriate statistical values to make them accurate and valid.

5.2 Sample profile analysis

5.2.1 Gender analysis

Table 1- Gender analysis

What is your gender?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	33	32.0	32.0	32.0
	Male	54	52.4	52.4	84.5
	Prefer not to say	16	15.5	15.5	100.0
	Total	103	100.0	100.0	

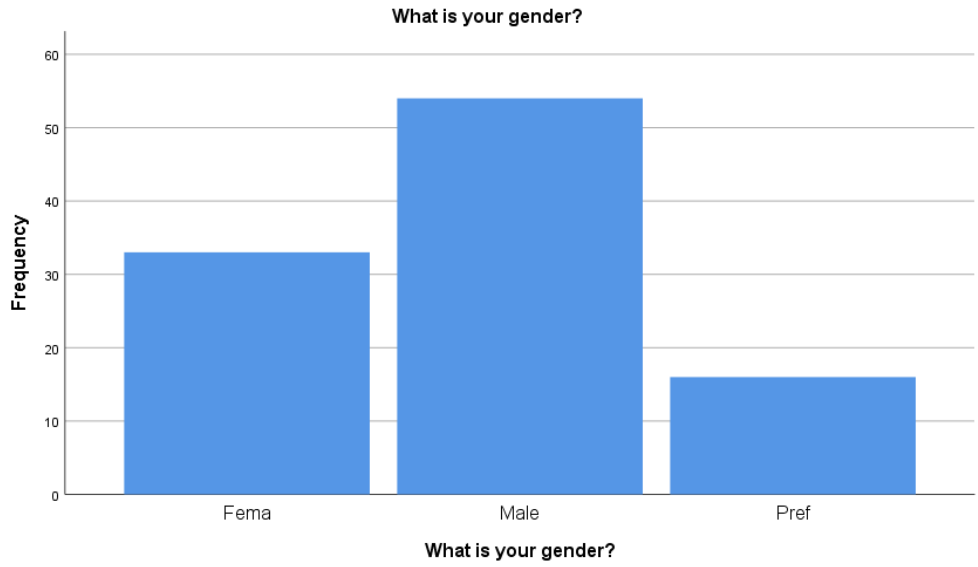

Figure 3- Gender analysis

The distribution of the people based on gender who responded indicates that the majority of the respondents were males (54, or 52.4 percent), followed by women (33, or 32.0 percent). In addition, 16 individuals (15.5 percent) who responded to the question expressed that they did not want to specify their gender. These details are summarised in Table 1. This is an indication that the number of men participating was more than the women, and several

respondents did not want to state what gender he/she belonged to. The results show that the views of males and females are incorporated, yet there is a possibility that the views reported in the study can be mainly influenced by the male respondents. Also, 15.5 percent did not disclose information, highlighting the need to encourage inclusivity and the comfort of the respondent when addressing demographic data gathering.

5.2.2 Age analysis

Table 2- Age analysis

What is your age range?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Above 46 years	20	19.4	19.4	19.4
	Between 18- 25 years	27	26.2	26.2	45.6
	Between 26-35 years	29	28.2	28.2	73.8
	Between 36-45 years	26	25.2	25.2	99.0
	Prefer not to say	1	1.0	1.0	100.0
	Total	103	100.0	100.0	

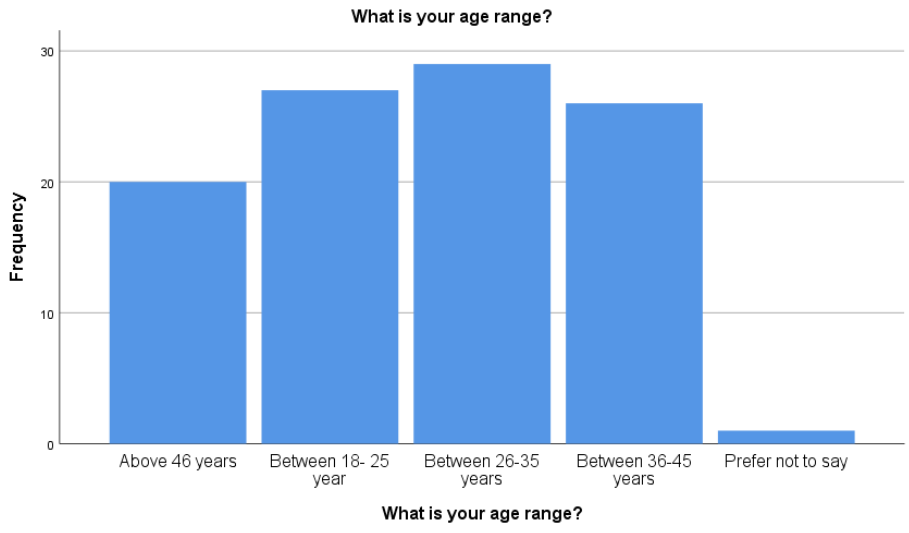

Figure 4- Age analysis

The distribution of respondents in terms of their age group reveals that the highest number of respondents are in the 26-35 years age bracket with 29 people (28.2%) followed by the 18-25 years age group of 27 people (26.2%), and the 36-45 years age group with 26 people (25.2). There were 20 participants (19.4%) who were older than 46 years, and only one participant (1.0%) chose not to say their age. As shown in Table 2, the responses are distributed across different age groups. These results show that the main working-age groups are fairly evenly represented, with a slight majority of younger and middle-aged adults. This suggests that the views in this study come from a wide range of generational experiences, but they are mostly from people who are currently working.

5.2.3 Marital status

Table 3- Marital status

What is your marital status?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Divorce	15	14.6	14.6	14.6
	Married	29	28.2	28.2	42.7
	Prefer not to say	20	19.4	19.4	62.1
	Unmarri	39	37.9	37.9	100.0
	Total	103	100.0	100.0	

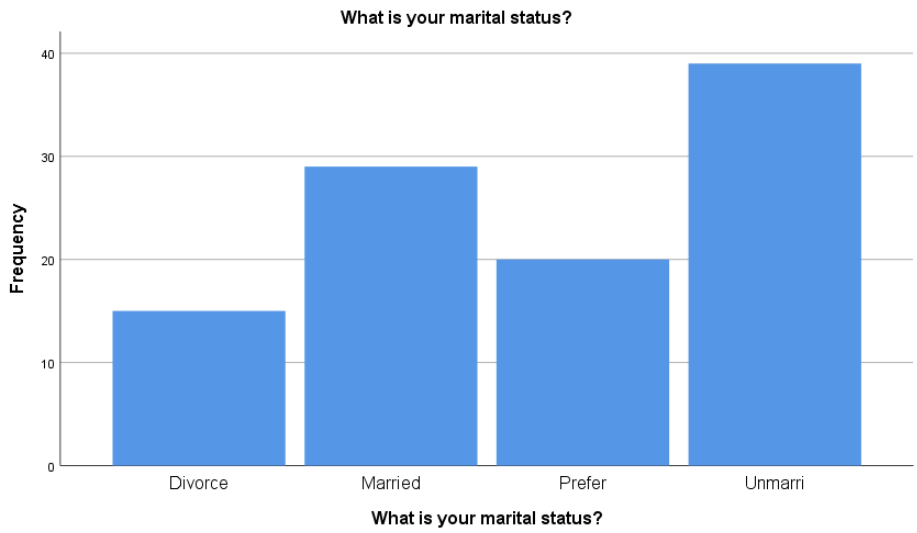

Figure 5- Marital status

The marital status distribution of respondents as presented in Table 3**,** indicates that the predominant group consists of unmarried individuals, totalling 39 respondents (37.9%), followed by married participants at 29 respondents (28.2%). A significant segment of the sample, comprising 20 respondents (19.4%), opted not to reveal their marital status, whereas 15 respondents (14.6%) indicated they were divorced. This shows that the sample is made up of people with different personal situations. Most of them are single, a lot are married, and a smaller number are divorced. There is also a large group of people who didn't want to say what their status was (Figure 5).

5.2.4 Income analysis

Table 4- Income analysis

What is your average monthly income range? (in â,¬)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Above 4000	9	8.7	8.7	8.7
	Below 2500	32	31.1	31.1	39.8
	Between 2500- 300	30	29.1	29.1	68.9
	Between 3000-3500	14	13.6	13.6	82.5
	Between 3500-4000	17	16.5	16.5	99.0
	Prefer not to say	1	1.0	1.0	100.0
	Total	103	100.0	100.0	

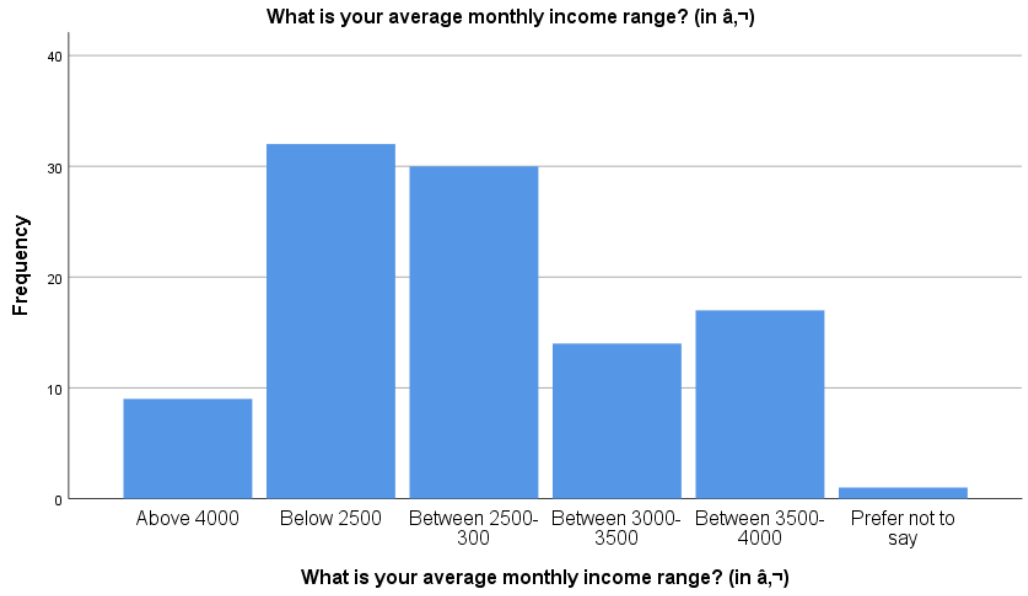

Figure 6- Income analysis

The results for average monthly income, as detailed in Table 4, show that the biggest group of respondents, 32 people (31.1%), make less than €2500, and the next biggest group, 30

people (29.1%), make between €2500 and €3000. Only 17 of the 100 respondents (16.5%) said they made between €3500 and €4000, and 14 of the 100 respondents (13.6%) said they made between €3000 and €3500. Only 9 of the 100 people who answered (8.7%) make more than €4000, and 1 of the 100 people who answered (1.0%) did not want to say how much they make. The data shows that most of the people who answered the question have monthly incomes below €3000, and there are fewer people in the higher income brackets (Figure 6).

5.3 Descriptive analysis

Table 5- Descriptive statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
GB	103	6.00	20.00	14.3107	3.31079	-.406	.238	-.035	.472
REF	103	6.00	20.00	15.0971	3.29442	-.789	.238	.448	.472
GL	103	6.00	20.00	15.4660	3.48615	-.959	.238	.568	.472
SD	103	6.00	20.00	15.6602	3.19176	-.743	.238	.348	.472
Valid N (listwise)	103								

The mean score for green bonds (GB) is 14.31, and the standard deviation is 3.31. This means that the answers are not too different from each other. The minimum and maximum values are 6.00 and 20.00, which shows that all of the possible scale points are there. The skewness

value of –0.406 suggests a slight negative skew, which means that more people tended to score towards the higher end of the scale. The kurtosis value of –0.035, on the other hand, shows a distribution that is close to normal, with neither too many peaks nor too few.

Renewable energy financing (REF) have a mean of 15.10, which is slightly higher than GB, and a standard deviation of 3.29, which is similar to GB's, showing that they are both variable. The skewness of –0.789 shows a stronger left skew, which means that higher scores are more likely. The kurtosis of 0.448 shows that the distribution is not as peaked as normal. This means that people are more likely to agree with or think positively about renewable energy sources.

The mean for green loans (GL) is 15.47, which is the second-highest of the four variables. The standard deviation is 3.49, which is a little higher than the mean, showing that responses are a little more varied. The skewness of –0.959 indicates the most pronounced negative skew among all variables, signifying that respondents generally assigned higher ratings to green loans. The kurtosis of 0.568 also points to a moderately peaked distribution, which means that responses are grouped around the mean.

Lastly, sustainable development (SD) has the highest mean score of 15.66, which shows that it is the most positive of the variables. The standard deviation of 3.19 is the lowest, which means that the responses were a little less varied. The skewness of –0.743 shows a clear negative skew, which means that people tend to score higher. The kurtosis of 0.348, on the other hand, suggests that the distribution is only slightly peaked.

As shown in Table 5**,** the data indicates that participants generally have positive views on all four construct, especially sustainable development and green loans, since their mean scores are higher and their skewness values are negative. The relatively small standard deviations show that responses are fairly consistent. The patterns of skewness and kurtosis suggest that ratings are slightly clustered towards the higher end of the scale, which could mean that respondents have a strong pro-environmental attitude.

5.4 Correlation analysis

Table 6- Correlation analysis

Correlations

		SD	GB	RES	GL
SD	Pearson Correlation	1	.601**	.642**	.676**
	Sig. (2-tailed)		.000	.000	.000
	N	103	103	103	103
GB	Pearson Correlation	.601**	1	.664**	.615**
	Sig. (2-tailed)	.000		.000	.000
	N	103	103	103	103
REF	Pearson Correlation	.642**	.664**	1	.692**
	Sig. (2-tailed)	.000	.000		.000
	N	103	103	103	103
GL	Pearson Correlation	.676**	.615**	.692**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	103	103	103	103

**. Correlation is significant at the 0.01 level (2-tailed).

These results are presented in Table 6. Specifically, SD has a Pearson correlation coefficient of 0.601 with GB, which means that there is a moderately strong positive relationship between the two. This means that more green bonds being issued and used is likely to lead to better results for sustainable development. The significance level (p = 0.000) shows that this relationship is not random.

In the same way, SD has a 0.642 correlation with REF, which shows a strong positive relationship. This means that using more renewable energy financing is linked to higher levels of sustainable development. This shows how important it is to use renewable energy to protect the environment and the economy. Once more, the relationship is statistically significant at the 0.01 level.

GL has the highest correlation with SD among the three independent variables, at 0.676. This means that there is a strong and significant positive relationship between the two. This indicates that access to and utilisation of green loans significantly contribute to the advancement of sustainable development initiatives, potentially by funding environmentally friendly projects and infrastructure. The significance level of 0.000 strengthens this relationship.

In general, the results show that all three independent variables—green bonds, renewable energy sources, and green loans—are strongly and positively linked to sustainable development. Green loans have the strongest link, followed by renewable energy sources and green bonds. This shows how financial tools and the use of clean energy can help achieve sustainability goals.

5.5 Reliability analysis

Table 7- Reliability analysis

Variable	No of items	Cronbach's alpha	Internal consistency
GB	04	.896	Acceptable
REF	04	.801	Acceptable
GL	04	.842	Acceptable
SD	04	.812	Acceptable

The reliability analysis results are presented in Table 7, Green Bonds (GB) had the highest Cronbach's alpha value of 0.896, which means that they were very consistent with each other. This means that the four items used to measure GB are very closely related to each other, which means that they give a good picture of the construct. This high value shows that the

people who answered the questions about the GB-related items did so in a consistent way, which makes the results about this variable more reliable.

On the Cronbach alpha, it was 0.801, which is acceptable since the value indicates that the data is consistent with itself. This implies that the four indicators that gauge the RES provide a stable and reliable image of the variable. This will ensure that the answers are not contrived, but everywhere is the same thing.

Cronbach's alpha of the Green Loans (GL) was 0.842, which also indicates that the data was extremely consistent internally. This implies that the items that will measure GL are highly reliable in terms of obtaining the opinion of respondents on the green loan programs and their impact. The score also demonstrates that the measurement error was not very large, which causes the corresponding findings to be more reliable.

Lastly, Sustainable Development (SD) had a Cronbach's alpha of 0.812, which demonstrates the precise nature of the SD. This indicates that the objects of SD are consistent in showing how individuals perceive and think of sustainable development, implying that the measurement of the variable is reliable to perform further analysis.

Overall, the results show that all of the constructs used in the study are measured with good reliability. This means that the data is consistent and stable, which makes future statistical analyses and interpretations more credible.

5.6 Regression analysis

Table 8- Model summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.733[a]	.537	.523	2.20450

a. Predictors: (Constant), GL, GB, REF

b. Dependent Variable: SD

The model summary results are presented in Table 8. The multiple regression model, which uses Green Loans (GL), Green Bonds (GB), and Renewable Energy Financing (REF) as predictors, can explain 53.7% of the difference in Sustainable Development (SD). This is shown by the R Square value of 0.537. This means that these three independent variables together can explain just over half of the changes in SD. The Adjusted R Square value of 0.523 shows that the model explains a little less variance when you take into account the number of predictors, but it still shows a strong ability to explain things. The R value of 0.733 shows that there is a strong positive relationship between the predictors and SD. The standard error of the estimate (2.20450) tells people how far off the observed and predicted values of SD are on average. A smaller value means the model is more accurate.

Table 9- ANOVA

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	557.983	3	185.994	38.272	.000[b]
	Residual	481.124	99	4.860		
	Total	1039.107	102			

a. Dependent Variable: SD

b. Predictors: (Constant), GL, GB, REF

The ANOVA results are presented in Table 9, which further support the statistical significance of the regression model. The F-statistic value of 38.272 with a significance level of $p = 0.000$ ($p < 0.05$) shows that the model as a whole is very important. This means that if one look at Green Loans, Green Bonds, and Renewable Energy Financing all together, they make a statistically significant difference in predicting Sustainable Development. The regression sum of squares (557.983) and the residual sum of squares (481.124) show that the predictors, not unexplained error, explain a large part of the total variation in SD.

Table 10- Coefficient analysis

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	3.881	1.127		3.444	.001
	GB	.199	.092	.206	2.156	.034
	REF	.232	.101	.240	2.298	.024
	GL	.351	.091	.384	3.879	.000

a. Dependent Variable: SD

Green Bonds (GB) have a positive and statistically significant effect on Sustainable Development, with an unstandardised coefficient of 0.199 and a standardised beta of 0.206. This means that if GB goes up by one unit, SD is expected to go up by 0.199 units, assuming that all other factors stay the same. The t-value of 2.156 and the p-value of 0.034 ($p < 0.05$) show that this effect is important. This is why the issuance and investment in green bonds form a significant portion of the sustainable development promotion.

The positive impact of REF on SD is also statistically significant, with the unstandardised coefficient of RES being 0.232, whereas it has a statistically significant standardised beta of 0.240. This implies that when all other things remain constant, when an additional unit of renewable energy is used, an additional increment of 0.232 units would be associated with an increase in SD. This relationship is indicated as statistically significant with a t-value of 2.298 and a p-value of 0.024. This demonstrates the level of necessity in renewable energy financing to achieve sustainable outcomes.

Green Loans (GL) turn out as the most effective predictor of the three factors, where the unstandardised coefficient is 0.351 and the standardised beta is 0.384. This implies that when other things remain constant, there exists a 0.351-unit change in the GL and SD caused by a one-unit change in GL. The relationship is very strong since the t-value is 3.879 and the p-

value is 0.000 ($p < 0.001$). It demonstrates that green loans are highly important to the sustainability of development. These results are summarised in Table 10.

5.7 Chapter Summary

In brief, it was found during the analysis that all three independent variables of Green Bonds, Renewable Energy Sources, and Green Loans have a statistically significant, positive effect on Sustainable Development, with Green Loans having the largest impact on it. The outcomes of regression analysis supported the fact that the model is significant in explaining a large share of the variance in the outcome of sustainable development, and ANOVA results confirmed the overall statistical significance of the model. The implications of these findings are thus strong in indicating the importance of green financial instruments and renewable energy integration in the achievement of the sustainability objectives. The results of the chapter will serve as the foundation of the current discussion, in which the implications of the mentioned results will be viewed through the perspective of existing literature and the research goals.

Chapter 06- Discussion

6.1 Critical reflection

The findings of this research paper largely agree with the findings of other scholars regarding green financing and the aspect of sustainable development of green financing. They reveal that the positive impact of green bonds, renewable energy funding, and green loaning can be observed in Ireland. This paper supports the study of Alamgir and Cheng (2023) and Bhutta et al. (2022), suggesting that green bonds could be an effective means of sustainable development; nevertheless, their impact seems more significant than it was stated in some international reports. This disparity is possibly because the size of the green bond market in Ireland is immature and low. This indicates that the fundamental mechanics have already been established, only that the market should be expanded and the guidelines should be better defined in order to achieve their potential. This detail would add the local understanding to the overall discussion, and this observation shows the importance of the context in evaluating the effectiveness of green finance.

The significant influence of renewable energy funding discovered here is similar to that of Wang and Taghizadeh-Hesary (2023) and Byrne (2024), who focused on the importance of renewable energy in terms of sustainability. This paper highlights the fact that structural barriers like policy ambiguity and the lack of funding continue to frustrate the rate of impact in Ireland despite a strong positive correlation. This observation helps improve on previous research as it shows the tension between the aspirations and realities of policy on one hand and the challenge of implementation of the policy on the other. This shows that, besides the increased investments, certain policy mechanisms as well as innovative financial tools could be the keys to eliminating these choke points more efficiently.

This paper has unveiled a novel key finding, which is the relatively high impact of green loans on the development of sustainability, an issue that has not gained much attention in prior studies that focused on Ireland. It has been noted that green loans are important (Belova et al., 2023; Gulzhan et al., 2023); nevertheless, this paper reveals that green loans are the most important green financing tool in Ireland. This raises new questions on what makes green loans successful in one particular region, whether it is the policies of a loaning

institution, knowledge of the borrower, or risk models. It also suggests that this is a good area for more research. The study also emphasises the potential risks and regulatory requirements identified by Ozili (2023), indicating that although green loans hold promise, their sustainable expansion necessitates strong frameworks. This critical reflection not only reinforces existing knowledge but also suggests nuanced explanations for Ireland's unique green finance landscape, indicating areas for future policy and research focus.

6.2 Practical implications

The results of this study have important real-world effects for Irish government policymakers. Because green financing practices, especially green loans, have been shown to have a positive effect on sustainable development, policymakers have a clear chance to strengthen the incentives and rules that encourage banks to offer more green financing. Making green finance more appealing and easier to get by increasing transparency, standardising green loan definitions, and providing tax breaks could help Ireland reach its sustainability goals faster. Policymakers should also work to remove the structural barriers to financing renewable energy by making the approval process easier and encouraging new ways to finance projects. These kinds of targeted actions can help make sure that the money that is spent on the ground matches the goals of the policy.

The research shows that financial institutions and businesses should make green finance products a part of their main services and business plans. Banks and other lending institutions could take advantage of the growing interest in and effectiveness of green loans by creating specialised products for different sectors, such as projects that use renewable energy, upgrades that save energy, and infrastructure that is environmentally friendly. This not only gives the company a competitive edge, but it also fits with global trends that stress environmental, social, and governance (ESG) criteria. This assists the firms in addressing the interests of both investors and customers. Moreover, corporations can define their sustainability objectives and finance them by the means of green financing. This brings about a cycle of impact and investment, which makes the business more sustainable in the long term.

Employees and individual borrowers will also benefit through the availability and marketing of the green financing in a greater state. The more green financing is done, the greater the chances are of people who are working in the field of sustainability, finance, and energy to get employment. It also implies that individuals should know more about green financial issuances and sustainability indicators. For people, especially homeowners or small business owners who want to make their homes or businesses more energy-efficient or use renewable energy, affordable green loans are a practical way to help meet sustainable development goals while also saving money on energy costs. So, making people more aware of green finance and making it easier for individuals and businesses to use it can be very important in creating a more sustainable culture in Ireland.

Chapter 07- Conclusion and Recommendations

7.1 Conclusion

7.1.1 Objective 01

The findings of the study demonstrate that green bonds significantly and positively contribute to sustainable development in Ireland. The coefficient of regression of the green bond was significant but not as important as that of other variables, implying that green bond encourages sustainability, but have a moderate effect as compared to other forms of green financing. This supports the argument of Alamgir and Cheng (2023), who noted that green bonds provide an invaluable tool in mobilizing capital to support environmentally sustainable activities, thereby facilitating the move to achieve sustainable development goals (SDGs). Nevertheless, the overall moderate effect could mean limitations in the present magnitude or market development of green bonds in Ireland.

Contradictory findings on the effectiveness of green bonds are present in previous literature, with no conclusive findings. Bhutta et al. (2022) also stated that green bonds had the potential to help raise large amounts of money to finance renewable energy and environmental projects across the globe, which resonates with the positive correlation in this paper. Maino (2022) cautioned, however, that inconsistencies in regulations and the possibility of greenwashing may restrict the maximum potential of green bonds. This might be the reason why it had only a moderate impact in Ireland. This distinction between the potential and the actual costs points to the need to increase the quality of governance and transparency of the issuance of green bonds in Ireland.

The findings of this study are equal to those established by Tolliver et al. (2019), who argue that the effectiveness of green bonds as a sustainable finance instrument of this nature depends on their consistency with policy structures and ensuring investors are confident in them. The fact shows that the Irish green bond market is undergoing changes, but it also requires the development of enhanced supportable mechanisms that can maximise its contribution to sustainable development. Therefore, the role of green bonds has been

established; however, it is not very transformative yet in certain international settings. This demonstrates that there is still an opportunity in the market to improve and have new ideas in policy.

7.1.2 Objective 02

It was discovered in this study that renewable energy financing is a key contributor to sustainable development, whose effects are felt more prominently than those of green bonds. This result corresponds to the findings of Wang and Taghizadeh-Hesary (2023), who established the fact that the funding of renewable energy projects has become crucial toward achieving carbon neutrality and sustainable development. The positive correlation and the probability of the significance of this regression coefficient prove that the investments in renewable energy directly correlate with the positively shifted sustainability performance in the Ireland country showing the commitment of Ireland to the planet to shift to greener energy resources.

The observation supports the growing body of evidence that renewable energy financing plays a very significant role in facilitating the role of energy transition and the Sustainable Development Goals (SDGs) (Bei and Wang, 2023; Rourke et al., 2009). Byrne (2024) further stated that a major component of the sustainable finance plan of Ireland is renewable energy. He emphasized that project implementation is more successful when they are given particular financial aid, and people are quicker to implement. The findings of the current research build upon these with quantitative support of the findings that financially promising renewable energy has a significant influence on the indicator of sustainable development in the case of Ireland.

However, a critical discussion points to the fact that some challenges still take place, as Sen and Ganguly (2017) have argued that such issues as policy ambiguity and lack of sufficient funds would be the possible barriers to investments in renewable energy. The information shows a positive impact, but the size and pace of this impact can be constrained by such systemic barriers. In turn, the research aligns with the existing body of literature that suggests a higher level of policy incentives and a wider range of financial tools to realise the potential of renewable energy financing in Ireland.

7.1.3 Objective 03

Among the three tools in terms of green financing that have been considered, green loans have shown the most desired outcome of sustainable growth. The significant correlations and the largest regression coefficient indicate that the process of green loans is an extremely efficient means of advancing environmental sustainability in Ireland. This fact confirms Belova et al. (2023), who stated that green loans are simple to borrow and flexible solutions that make companies and individuals implement sustainable actions as they provide them with funds they can use to pursue certain purposes.

The role of the green loans in providing affordable, sustainable investments at an easily accessible level, even in locations where direct investment is not possible, has also been suggested in previous studies like those of Gulzhan et al. (2023) and Rasoulinezhad and Taghizadeh-Hesary (2022). The high influence of this study might also indicate that green loans in Ireland could be more successful in persuading people to acquire loans as compared to other instruments of green finance. It may be due to their improved lending policies or due to the condition in the market, which is favorable with regard to taking loans.

Nevertheless, the critical analysis of these results should consider the issues outlined by Omri et al. (2025), Ozili (2023), who argue that loan repayment, monitoring, and standardisation risks can encourage obstacles to the scalability and effectiveness of green loans. Although this study is very encouraging, it shows that Ireland might need better regulatory policies and risk management approaches to sustain and grow the green loan market. Consequently, green loans stand as one of the promising yet shifting mechanisms, to be enhanced constantly to remain among the leadership list of means helping to promote sustainable development.

7.2 Recommendations

Increase Government incentives for green financing.

The government ought to establish or increase financial incentives/subsidies, including tax breaks, subsidies, and low-interest loans, to motivate businesses and investors to engage in

green financing activities in larger proportions. These incentives will reduce the financial risk of the sustainable projects and streamline investments in green bonds, renewable energy, and green loans. The presence of a favourable policy environment will ensure that the gap between the financial markets and the Sustainable Development Goals will be bridged to facilitate the process of transforming Ireland into a greener economy.

Encourage Sensitisation and Capacity Building of the Financial Institutions.

Creating awareness and understanding of green finance products among the financial institutions and their clients is vital. There is a need to create training programs and knowledge-sharing platforms to develop capacity in banks, credit unions, and investment firms. This will allow them to more carefully weigh and assess the risks and returns of using green financing options to see that more organizations have access and can effectively utilize such tools in order to assist in the development of sustainability.

Promote the creation and use of Various Green Financing Tools.

In addition to already becoming more popular, green bonds and green loans, financial institutions and policymakers ought to encourage the creation and application of a broader assortment of green funding solutions through sustainability-linked loans, green securitization, and impact investing. The broadening of the toolkit will provide more specific solutions that satisfy the desires of various sectors and project types, enhancing the efficiency of the entire market and ensuring that others can join the financing of sustainable development projects.

Enhance Regulatory Frameworks to Enhance Green Finance Transparency and Accountability.

Ireland ought to upgrade the regulatory standards of environmental, social, and governance (ESG) disclosures/reporting demands to achieve credibility and trust in the green finance markets. There should be clearly stated guidelines and verification procedures that ensure money that considers itself to be green is helping to achieve sustainable results. Enhanced monitoring will safeguard the investors and prompt good lending and investing that flow along with local and worldwide sustainability goals.

Build Public-Private Partnership to Facilitate Sustainable Development Projects.

To increase the actions of green finance, collaboration between governmental organizations, business entities, and civil society is crucial. Partnering with businesses strengthens the availability of resources, consolidation expertise, and minimizes risks involved in the project, especially when it involves large infrastructure, renewable energy projects. The involvement of multi-stakeholders will maximize resource distribution and speed up progress towards the achievement of sustainable development goals in Ireland.

7.3 Limitations

Although the study presents many useful details on how green financing practices affect sustainable development in Ireland, it is relevant to consider the limitations. To begin with, 103 participant sample size is adequate to complete quantitative analysis, but it might not cover the whole sector and areas in Ireland, hence, having limited generalizability of the results. Use of the purposive sampling methodology, which targeted professionals in the field of finance, renewable energy, and sustainability, may have been somewhat biased and left out other possible stakeholders who may be of concern, like policymakers, consumers, or grassroots organizations. Also, the use of self-report data using closed-ended questionnaires could have limited the richness of responses, given that it may have resulted in biases in the responses since the respondents could have been inclined to give socially acceptable answers. In addition, the cross-sectional nature of the study represents the measurement of the data at a single time instance, so it cannot be used to follow the changes or the causality in the long term.

7.4 Future Directions

The researcher could improve this paper by undertaking a longitudinal design that could follow the changes that green financing has in the field of sustainable development in the long term to allow a better comprehension of the causality and the effects. Representativeness would also be further enhanced by expanding the sample and reaching a greater diversity of people that would include more stakeholders like government officials, environmental NGOs, and individual consumers to enrich the data. The qualitative data, such as interviews or focus

groups, may be integrated to discuss more insightful information, drivers, and obstacles encountered by different actors in the green financing industry. Also, it would be possible in the future to study the combination and the comparative effectiveness of new green finance tools such as sustainability-linked loans and green securitization, which are growing in popularity around the world. It is also possible to research how digital financial technologies and blockchain can aid transparency and trust in green finance markets.

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Appendix

Questionnaire

The purpose of this research is to analyze **the role of green financing practices on sustainable development: an Ireland projection,** through a primary data collection from dealers in electric vehicles in Ireland. This questionnaire consists of two parts. The data provided by respondents will be considered as strictly confidential.

Part A- Background analysis

1. What is your gender?

Male
Female
Prefer not to say

2. What is your age range?

Between 18- 25 years
Between 26-35 years
Between 36-45 years
Above 46 years

3. What is your marital status?

Married
Unmarried
Divorced

4. What is your average monthly income range? (in €)

Below 2500
Between 2500- 3000

Between 3000-3500

Between 3500-4000

Above 4000

Part B- Study variables

State your agreement upon these statements.

Strongly agree- SA

Agree- A

Neutral- N

Disagree- D

Strongly Disagree- SD

Independent variables

Green bonds

5. Green bonds have enhanced the financing of environmentally friendly projects in Ireland.
6. In my opinion, green bonds help in various ways towards minimizing carbon emissions by developing clean and green infrastructure.
7. The issuance of green bonds has made Ireland determined to meet the targets of sustainability.
8. Green bonds provide a good solution to funding long-term green investment in Ireland.

Renewable energy sources

9. The switch to renewable energy sources in Ireland has been sped up by the provision of funds.

10. Financing of renewable energy has also motivated businesses to invest in solar, wind, or hydro power.
11. The Green jobs and innovation in Ireland have been facilitated by renewable energy financing efforts.
12. In my opinion, the renewable energy financing in Ireland is working directly towards the sustainable development of the country.

Green loans

13. Through green loans, business or individuals are able to practice eco-friendly activities with ease.
14. Green loan arrangements have enhanced the knowledge and willingness to practice sustainability among Irish industries.
15. The accessibility of green loans affects the choice of green infrastructure or technology.
16. In my opinion, green loans have a positive impact not only on the environment but also on resource efficiency in Ireland.

Dependent variable

Sustainable development

17. Green financial instruments have contributed positively towards enhancing environmental quality in Ireland.
18. Green financing has generated sustainable economic growth in the recent past, as evidenced.
19. I think the work in green financing by Ireland has made it to meet the UN Sustainable Development Goals (SDGs).
20. Green finance investment has enhanced ecological as well as social well-being in Ireland.