i-SPiKE 2023

INTERNATIONAL EXHIBITION & SYMPOSIUM ON PRODUCTIVITY, INNOVATION, KNOWLEDGE & EDUCATION

"Optimizing Innovation in Knowledge, Education and Design"

EXTENDED ABSTRACT

e ISBN 978-967-2948-56-8

i-SPIKE 2023

INTERNATIONAL EXHIBITION & SYMPOSIUM ON PRODUCTIVITY, INNOVATION, KNOWLEDGE & EDUCATION

"Optimizing Innovation in Knowledge, Education and Design"

EXTENDED ABSTRACT

Editors : Dr. Siti Norfazlina Yusoff
Azni Syafena Andin Salamat
Nurfaznim Shuib

Cover design : Syahrini Shawalludin
Layout : Syahrini Shawalludin

eISBN 978-967-2948-56-8

Published by:
Universiti Teknologi MARA (UiTM) Cawangan Kedah,
Sungai Petani Campus,
08400 Merbok,
Kedah,
Malaysia.

Assalamualaikum warahmatullahi wabarakatuh,

First and foremost, I would like to express my gratitude to the organizing committee of i-Spike 2023 for their tremendous efforts in bringing this online competition a reality . I must extend my congratulations to the committee for successfully delivering on their promise to make i-Spike 2023 a meaningful event for academics worldwide.

The theme for this event, 'Optimizing Innovation in Knowledge, Education, and Design,' is both timely and highly relevant in today's world, especially at the tertiary level. Innovation plays a central role in our daily lives, offering new solutions for products, processes, and services By adopting a strategic approach to 'Optimizing Innovation in Knowledge, Education, and Design,' we have the potential to enhance support for learners and educators, while also expanding opportunities for learner engagement, interactivity, and access to education.

I am awed by the magnitude and multitude of participants in this competition. I am also confident that all the innovations presented have provided valuable insights into the significance of innovative and advanced teaching materials in promoting sustainable development for the betterment of teaching and learning. Hopefully, this will mark the beginning of a long series of i-Spike events in the future.

It is also my hope that you find i-Spike 2023 to be an excellent platform for learning, sharing, and collaboration. Once again, I want to thank all the committee members of i-Spike 2023 for their hard work in making this event a reality I would also like to extend my congratulations to all the winners, and I hope that each of you will successfully achieve your intended goals through your participation in this competition.

Professor Dr. Roshima Haji Said
RECTOR
UiTM KEDAH BRANCH

WELCOME MESSAGE (i-SPiKE 2023 CHAIR)

We are looking forward to welcoming you to the 3rd International Exhibition & Symposium on Productivity, Innovation, Knowledge, and Education 2023 (i-SPiKE 2023). Your presence here is a clear, crystal-clear testimony to the importance you place on the research and innovation arena. The theme of this year's Innovation is "*Optimizing Innovation in Knowledge, Education, & Design*". We believe that the presentations by the distinguished innovators will contribute immensely to a deeper understanding of the current issues in relation to the theme.

i-SPiKE 2023 offers a platform for nurturing the next generation of innovators and fostering cutting-edge innovations at the crossroads of collaboration, creativity, and enthusiasm. We enthusiastically welcome junior and young inventors from schools and universities, as well as local and foreign academicians and industry professionals, to showcase their innovative products and engage in knowledge sharing. All submissions have been rigorously evaluated by expert juries comprising professionals from both industry and academia.

On behalf of the conference organisers, I would like to extend our sincere thanks for your participation, and we hope you enjoy the event. A special note of appreciation goes out to all the committee members of i-SPiKE 2023; your dedication and hard work are greatly appreciated.

Dr. Junaida Ismail
Chair
3rdInternational Exhibition & Symposium Productivity, Innovation, Knowledge, and Education 2023 (i-SPiKE 2023)

NAVIGATING THE FDI-ENERGY NEXUS: A COMPREHENSIVE FRAMEWORK FOR SUSTAINABLE ENERGY FUTURES

Hafizah Hammad Ahmad Khan
Department of Economics & Financial Studies, Faculty of Business and Management, Universiti Teknologi MARA Cawangan Kedah, Kampus Sungai Petani, Kedah, Malaysia
hafizahhammad@uitm.edu.my

Rosmaiza Abdul Ghani
Faculty of Business and Management, Universiti Teknologi MARA Cawangan Melaka, Kampus Alor Gajah, Melaka, Malaysia
rosmaiza@uitm.edu.my

Muhammad Hanif Othman
Department of Economics & Financial Studies, Faculty of Business and Management, Universiti Teknologi MARA Cawangan Kedah, Kampus Sungai Petani, Kedah, Malaysia
hanifothman@uitm.edu.my

Handri Handri
Faculty of Economics and Business, Universitas Islam Bandung, Bandung, Indonesia
handrif2@unisba.ac.id

Azib Azib
Faculty of Economics and Business, Universitas Islam Bandung, Bandung, Indonesida
azib@unisba.ac.id

ABSTRACT
In today's globalized world, foreign direct investment (FDI) plays a crucial role in fostering economic growth and the development of nations. However, its implications for energy consumption require careful investigation. Since past studies predominantly explored the aggregate effects of FDI on energy consumption, this study aims to establish a comprehensive framework that provides nuanced insights into the FDI-energy relationship. The proposed framework delves into the sectoral-level effects and the roles of policy approach in assessing the impact of FDI on energy consumption. The framework can be used to examine whether FDI promotes cleaner energy, which economic sectors benefit the most from FDI inflows, and whether a country's policy significantly influences the FDI-energy dynamic. Hence, this framework will contribute to a more informed decision-making process by shedding light on the complex interplay between foreign investment, energy consumption, and environmental sustainability. With rising environmental awareness, this framework serves as a valuable tool to foster green development and assist countries in achieving sustainable energy futures.

Keywords: FDI, energy consumption, renewable energy, non-renewable energy, sustainable development

INTRODUCTION

The importance of having good access to affordable and sustainable energy has been highlighted under SDG 7 in the Sustainable Development Goals (SDGs). With the target to increase the share of renewable energy in the global energy mix by 2030, ensuring sustainable energy use has become a primary goal of countries. Among the potential drivers of energy usage is foreign direct investment (FDI). According to the pollution haven hypothesis, firms will relocate production abroad to avoid strict environmental regulations in their home country. As a result, FDI will have a significant impact on energy consumption in the host country. However, since countries adopt different policy approaches, the impact will vary across countries. Hence, this study aims to develop a comprehensive framework that can be used to assess the impact of FDI inflows on energy consumption across countries and various economic sectors.

LITERATURE REVIEW

The literature related to energy use and clean energy has grown significantly in the past decade following the establishment of the United Nations Sustainable Development Goals (SDGs). This includes the increase in the literature related to FDI and the energy nexus. According to Brucal et al (2019), multinational corporations often moved their production to developing countries to take advantage of less stringent environmental regulations. However, the existing body of literature concerning the impact of FDI on energy consumption provides mixed results that vary across countries (Doytch & Narayan, 2016; Kang, 2021; Saidi et al, 2017).

The mixed findings in the literature can be attributed to several factors. First, most of the past studies assess the impact of FDI on energy consumption at an aggregate level and thus fail to quantify the effects across various economic sectors and energy types. Secondly, the impact of FDI diverges across countries due to different policy approaches implemented by each country. Hence, a comprehensive framework should be developed to provide a deeper understanding of the impact of FDI on energy consumption across countries.

As supported by Doytch and Uctum (2011), studies that depend on aggregate data will fail to account for sectoral spillover effects, thus leading to biased outcomes. Furthermore, Doytch & Narayan (2016) argued that the study based on the sectoral level will reveal important information about which sector is associated with energy-saving technologies and energy-exhaustive technologies. Therefore, this study aims to fill the gap by delving into the sectoral-level effects and considering the unique policy approaches implemented by each country to examine the impact of FDI on energy consumption. This will provide a greater insight into identifying whether FDI promotes cleaner energy, and which economic sectors benefit the most from the FDI inflows. Such insights can significantly aid policymakers in formulating effective strategies toward achieving sustainable energy goals.

CONCEPTUAL FRAMEWORK

Addressing the limitations of prior research, this study introduces a novel comprehensive framework for assessing the impact of FDI on energy consumption. Figure 1 illustrate the connection between FDI and energy consumption, providing a visual representation of the proposed framework's key components and their role in shaping sustainable energy futures.

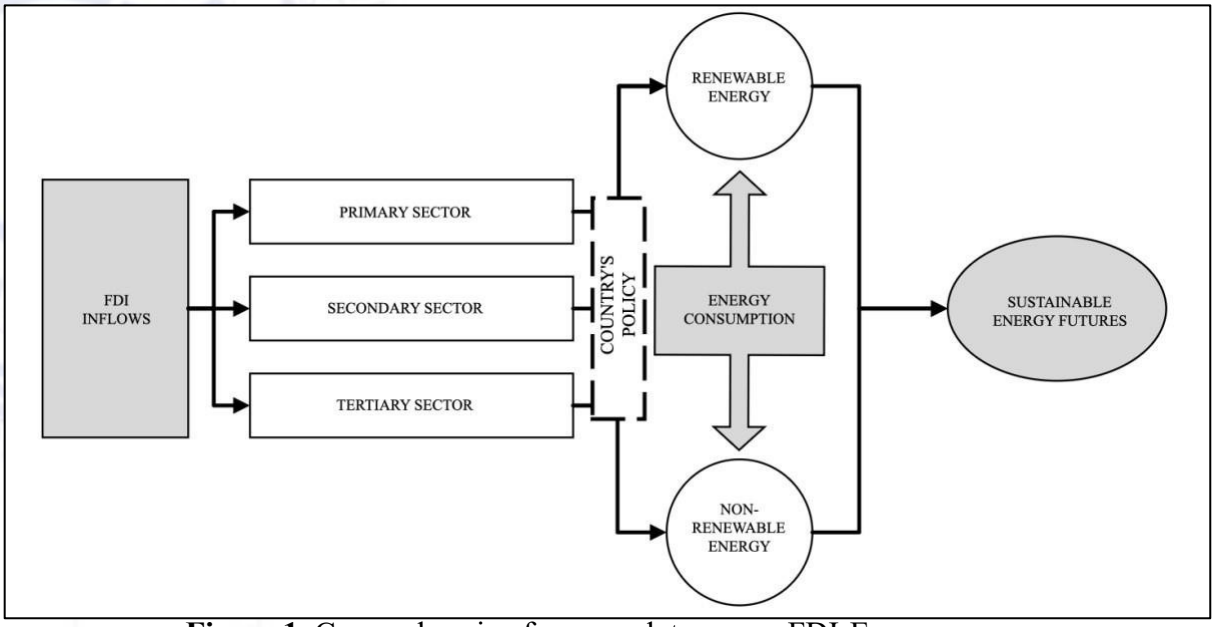

Figure 1. Comprehensive framework to assess FDI-Energy nexus

In order to achieve a sustainable energy future, FDI inflows across sectors must prioritize the utilization of renewable energy and reduce dependence on non-renewable sources. This can be accomplished through the implementation of appropriate policies that promote renewable energy production and usage, thus effectively contributing to sustainable energy goals outline in SDG7 of the United Nations Sustainable Development Goals.

CONCLUSION

In summary, the relationship between FDI and energy consumption is complex and varies among countries. Existing research yields mixed results, mainly due to a focus on overall trends rather than specific sectors and policies. This study aims to bridge these gaps by examining how FDI affects various economic sectors and considering the distinctive policies of each country. These insights could provide valuable guidance to policymakers in making informed decisions for promoting cleaner energy and sustainable development.

ACKNOWLEDGEMENTS

The author would like to thank Universiti Teknologi MARA (UiTM) and Universitas Islam Bandung for their funding support for this project under the Strategic Research Partnership Grant Scheme (Reference No: 100-RMC 5/3/SRP 060/2021).

REFERENCES

Brucal, A., Javorcik, B., & Love, I. (2019). Good for the environment, good for business: Foreign acquisitions and energy intensity. *Journal of International Economics*, *121*, 103247.

Doytch, N., & Narayan, S. (2016). Does FDI influence renewable energy consumption? An analysis of sectoral FDI impact on renewable and non-renewable industrial energyconsumption. *Energy Economics*, *54*, 291-301.

Doytch, N., & Uctum, M. (2016). Globalization and the environmental impact of sectoral FDI. *Economic Systems*, *40*(4), 582-594.

Kang, X., Khan, F. U., Ullah, R., Arif, M., Rehman, S. U., & Ullah, F. (2021). Does Foreign Direct Investment Influence Renewable Energy Consumption? Empirical Evidence from South Asian Countries. *Energies*, *14*(12), 3470.

Saidi, S., Badri, R., & Hammami, S. (2017). The impact of transport and foreign direct investment on energy consumption: recent evidence from high, middle and low income countries. *International Journal of Global Energy Issues*, *40*(5), 294-319.

e ISBN 978-967-2948-56-8