Vol. 12 • No. 2 • 2024 ISSN 2308-944X (Print) ISSN 2311-0279 (Online)

Review of Business and Economics Studies

DOI: 10.26794/2308-944X

The journal was reregistered
in the Federal Service for Supervision
of Communications,
Informational Technologies,
and Mass Media:
PI No. ФС77–67072
of 15 September 2016

**Publication frequency —
4 issues per year
Founder: Financial University**

The Journal is included into the system
of Russian Science Citation Index

Included in the Higher Attestation
Commission (VAK) List of journals
for scientific specialities: 5.2.3, 5.2.4, 5.2.5

The Journal is distributed by subscription.
Subscription index: 42137
in the consolidated
catalogue “The Press of Russia”

Издание перерегистрировано
в Федеральной службе по надзору
в сфере связи, информационных
технологий
и массовых коммуникаций:
ПИ № ФС77–67072
от 15 сентября 2016 г.

**Периодичность издания —
4 номера в год
Учредитель: Финансовый университет**

Журнал включен в систему Российского
индекса научного цитирования (РИНЦ)

Включен
в Перечень изданий ВАК
по научным специальностям: 5.2.3, 5.2.4, 5.2.5

Журнал распространяется по подписке.
Подписной индекс 42137
в объединенном каталоге
«Пресса России»

Т. 12 • № 2 • 2024 ISSN 2308-944X (Print) ISSN 2311-0279 (Online)

Вестник исследований бизнеса и экономики

DOI: 10.26794/2308-944X

Review of Business and Economics Studies

REVIEW OF BUSINESS AND ECONOMICS STUDIES (RoBES) is the quarterly peer-reviewed scholarly journal published by the Financial University under the Government of the Russian Federation, Moscow. Journal's mission is to provide scientific perspective on topical economic and business subjects.

CONTACT INFORMATION
Financial University
Leningradsky prospekt, 53,
office 5.6
125167, Moscow,
Russian Federation
Telephone: +7 (499) 553-10-74
(internal 10-88)
Website: https://rbes.fa.ru/jour

AUTHOR INQUIRIES
Inquiries relating to the submission of articles can be sent by electronic mail to ambotchkarev@fa.ru.

ISSN 2308-944X

Вестник исследований бизнеса и экономики

Редакция научных журналов
Финансового университета
125167, Москва,
Ленинградский пр-т, 53,
комн. 5.6
Тел. +7 (499) 553-10-74
(вн. 10-88)
Интернет: https://rbes.fa.ru/jour

Журнал “Review of Business and Economics Studies” («Вестник исследований бизнеса и экономики») зарегистрирован в Федеральной службе по надзору в сфере связи, информационных технологий и массовых коммуникаций 15 сентября 2016 г.
Свидетельство о регистрации ПИ № ФС77-67072.

Подписано в печать: 23.07.2024.
Формат 60 × 84 1/8.
Заказ № 942
Отпечатано в отделе полиграфии Финуниверситета (Москва, Ленинградский проспект, д. 49/2).
16+

Review of Business and Economics Studies

Volume 12, Number 2, 2024

Вестник исследований бизнеса и экономики

№ 2, 2024

ORIGINAL PAPER

DOI: 10.26794/2308-944X-2024-12-2-6-16
UDC 332.142.6:339.9(045)
JEL Q57, M310

Perception and Awareness of Consumers towards Green Products: Evidence from India

K.F. Darga, V.B. Gali
Yogi Vemana University, Kadapa, India

ABSTRACT

Consumers' growing concern for a healthy life has increased the production and use of eco-friendly products. Green marketing refers to the practice of conducting business based on its environmental benefits. Despite the health benefits of green marketing, many consumers remain unaware of it and its associated products. The study **aims** to provide consumers' views and perceptions of green marketing in Kadapa, Andhra Pradesh, India. The research is based on the primary **data** collected from consumers using a structured questionnaire to understand their perceptions of eco-friendly or green products. The study identifies the importance of green marketing and the critical role of green products in people's daily lives. The key factors influencing the buying decision of green products among customers have been identified, along with the reasons for the non-use of green products by other customers. The **results** show that consumers in Kadapa City, although aware of green marketing, have a low preference for buying green products. The study **concludes** that the highly influential factor that encourages customers to buy more green products is environmental motive, but the expensiveness of green products is the major reason for the low-level buying of green products by customers.

Keywords: green products; green marketing; environmental consciousness; consumer perception; consumer awareness; health; safety; environmental benefits; India

For citation: **Darga K.F., Gali V.B. Perception and awareness of consumers towards green products: Evidence from India.** ***Review of Business and Economics Studies*****. 2024;12(2):6-16. DOI: 10.26794/2308-944X-2024-12-2-6-16**

ОРИГИНАЛЬНАЯ СТАТЬЯ

Восприятие и осведомленность потребителей об экологически чистых товарах: эмпирический анализ из Индии

К.Ф. Дарга, В.Б. Гали
Университет Йоги Вемана, Кадапа, Индия

АННОТАЦИЯ

Растущее стремление потребителей к здоровому образу жизни привело к увеличению производства и использования экологически чистых продуктов. Зеленый (экологичный) маркетинг относится к практике ведения бизнеса с учетом его экологических преимуществ. Несмотря на пользу зеленого маркетинга для здоровья, многие потребители по-прежнему не знают о нем и связанных с ним продуктах. **Целью** исследования является изучение мнений и представлений потребителей о зеленом маркетинге в Кадапе, Андхра-Прадеш, Индия. Исследование основано на первичных **данных**, полученных от потребителей с помощью структурированной анкеты, с целью выяснения их восприятия экологически чистых или зеленых продуктов. Исследование выявило важность зеленого маркетинга и решающую роль экологически чистых продуктов в повседневной жизни людей. Определены ключевые факторы, влияющие на решение покупателей о покупке экологически

чистых товаров, а также причины неиспользования экологически чистых товаров другими покупателями. **Результаты** показывают, что потребители в городе Кадапа, хотя и осведомлены о зеленом маркетинге, не отдают предпочтения покупкам экологически чистых продуктов. В исследовании делается **вывод**, что очень важным фактором, который побуждает клиентов покупать больше зеленых продуктов, является экологический мотив, но дороговизна экологически чистых продуктов — основная причина низкого уровня продаж.
Ключевые слова: экологически чистые продукты; зеленый маркетинг; экологическое сознание; потребительское восприятие; осведомленность потребителей; здоровье; безопасность; экологические преимущества; Индия

Для цитирования: **Darga K.F., Gali V.B. Perception and awareness of consumers towards green products: Evidence from India.** ***Review of Business and Economics Studies*****. 2024;12(2):6-16. DOI: 10.26794/2308-944X-2024-12-2-6-16**

Introduction

Green marketing refers to the process of selling products and services with environmental benefits. Green marketing is a holistic approach that involves producing and marketing products and services in a way that minimizes their negative impact on the environment and nature. These products or services may be environmentally friendly or produced in a sustainable manner. It helps reduce immediate and long-term damage to the environment. It enhances consumer awareness about ecological problems and social responsibility.

The eco-friendly products may be of different kinds, e.g., bio-degradable cutlery, bamboo toothbrushes, environmentally friendly clothes, recycling plastic materials, vegan pet accessories, recycled active wear, reusable and stainless-steel water bottles, bio-degradable garden pots, reusable lunch wraps, recycled stationery, reusable grocery bags, eco-friendly phone cases, bamboo containers, paper and steel straws. The listed eco-friendly products are based on various types of ideas for generating and promoting eco-friendly green marketing.

Literature review

Bhatia and Jain [1] found that although consumers had a high level of awareness about green products, they were unaware of the green initiatives carried out by various government and non-government agencies, indicating the need for more efforts from organizations in this area. Dharmalingam and Palanisamy [2] have studied consumer perceptions of green products and how they influence buying behavior. This study statistically proved that level of age, education and income have significantly influenced the perception of green products. The study has concluded that consumers have a positive impact on green products. Mathai and Jegan [3] have conducted research on the factors influencing consumer satisfaction with green products. They have concluded that green values were found to be prevalent among respondents, and consumers were only moderately aware of green marketing practices and products. They also discovered that respondents shared common green values. According to Unnamalai and Gopinath [4], marketers and consumers are increasingly aware of the importance of switching to green products and services as consumers become more aware of the negative effects of global warming, non-biodegradable solid waste, pollutants of air, water, and land. According to Rajalakshmi et al. [5], people typically associate green marketing with the promotion and advertising of environmentally friendly products, but in reality, the product should originate naturally from the cultivation itself. Vani [6] investigated consumers' perceptions in Bengaluru. The study concludes that most Bangalore consumers possess knowledge of green marketing concepts and products. There is an association between gender, levels of education and the status of awareness of green marketing. There is no association between age group, monthly income and the status of awareness of green marketing. Most consumers' decisions to buy green products are influenced by several attributes. Most of the consumers strongly agreed with the different descriptions of green products. Kaur [7] has explained that green marketing has significance for both consumers and marketers, and it strongly supports the beginning of an era of green marketing in India. Due to its local concentration, the study's generalizability is limited, yet it nevertheless offers useful insights into consumer attitudes toward green products. The author has suggested that future studies can concentrate on consumer psychographic segmentation in order to evaluate their green values and preferences. Reddy et al. [8] have investigated how consumers' awareness of environmental issues has influenced their preferences while

shopping for eco-friendly goods. The study concluded that green product marketers owe greatly to perceived costs among consumers and are essential for creating marketing communication campaigns promoting green products. Olipane [9] found out that a large section of the respondents (50.30%) are from the age group of 25–44 years old with a mean of 37.64 years old; many respondents have attained bachelor's degrees (46.30%); the majority are from rank and file positions (72.60%); while supervisory positions were held by 27.40%; half of the respondents are permanent (49.50%); some are temporary (28.70%); and contractual (21.80%). Papadopoulos et. al. [10] concluded that **t**he Greek enterprises in the timber sector expressed a great interest in the protection of forests all over the world, ranging from illegal logging to their rational management. At the same time, in their overwhelming majority, they strongly support certification of the sustainable management of Greek forests. Thomas [11] suggested that the companies must keep in mind that the consumers are very concerned about the environmental issues cropping up in the country, and they are very willing to pay a premium price for the "green" products, if these eco-friendly products provide extra value to the consumers. The Nuryakin and Maryati [12] study raised the issue of the environment and sustainability of SMEs, as it is still an exciting research topic. This study was pioneered by social marketing theory, where company awareness of producing environmentally friendly products is essential to building sustainability and competitive advantage. Nagabhaskar and Chandrasekhar [13] have studied the competitive advantage and impact of 7 Ps (product or service, price, place, promotion, people, physical substantiation, process) of service marketing over 4 Ps (product, price, place, and promotion) of product marketing. Singh and Kumar [14] explained the concept of green marketing, its evolution, the green marketing mix, and its challenges. They also explained how companies are adopting green strategies in the market and the factors that can influence green marketing. Sewar, Kecskes and Keller [15] have analyzed and synthesized the research articles published from 2012 to 2022 that deal with green marketing and digital marketing. Correia, Sousa, Viseu and Larguinho [16] have shown that a strong correlation between consumers' attention to companies' green marketing communication and green purchasing behavior has been identified. The results also confirm that individuals with higher educational levels, green attitudes, and females are the most attentive to companies' green marketing communication. Braik, Saleh and Jaaron [17] provided valuable practical insights for manufacturing managers in developing countries on the role that green marketing can play in tackling manufacturing sustainability issues. Pahuja [18] has described the status of green marketing in India, the future of green marketing and concluded that green marketing is something that will continuously grow in both practice and demand. Investors generally do not respond well to corporate news about green marketing activities, according to Mathur and Mathur [19]. The average firm in the sample loses a statistically significant 3.14% of its market value in the 20 days surrounding the announcement date. Venkatesh [20] has suggested that green or eco-friendly products have good quality, but they are more expensive than regular products. Therefore, companies producing eco-friendly products should try to reduce costs. Government and business concerns should have worked together to create awareness among consumers. Mishra and Sharma [21] discussed how businesses have increased their rate of targeting green consumers, who are concerned about the environment and allow it to affect their purchasing decisions. Moser and Uzzell [22] have explained the psychology of the environment. Oyewole [23] presented a conceptual link between green marketing, environmental justice, and industrial ecology. It argued for greater awareness of environmental justice in the practice of green marketing. Sanjay and Gurmeet [24] have studied and analyzed the behavior and attitude of Indian consumers. Manashi [25] tried to identify the practices of green marketing adopted by various companies and the benefits derived therefrom.

Objectives of the study

1. To study the awareness of consumers in Kadapa district regarding green marketing.

2. To identify the factors influencing the buying decisions of consumers regarding eco-friendly products.

3. To analyze the reasons for the non-usage of green products by consumers.

Hypothesis

The study tested the following hypothesis:

H1: There is an association between gender and awareness of green marketing.

H2: There is an association between age and awareness of green marketing.

H3: There is an association between income level and awareness of green marketing.

Research methodology

Table 1 shows the research methodology chosen in the study, including the sample design, data collection methods and sources, nature of the research and data analysis tools used in the research.

Data analysis

The data collected from the primary sources were analyzed using percentage analysis and chi-square analysis.

Kadapa is a city in the southern part of Andhra Pradesh state, India. It is located in the Rayalaseema region and is the district headquarters of YSR Kadapa district (named in honor of Y.S. Rajasekhara Reddy). As of the 2022 Census of India, the city had a population of 466,000, a 2.42% increase from 2021. *Table 2* shows the demographic profile of the respondents.

Table 2 shows the demographic profile of the respondents which includes gender, age, educational qualification, occupation and income levels of the respondents. It is evident from the table that the majority of the respondents are males (65%), and the least of respondents are females (35%). The respondents in the age group of 25–30 years, with 32%, are the highest compared to other age groups, which shows that the younger generation is more interested in green marketing. The majority of the respondents are graduates (58%), and respondents with educational qualifications of post-graduation are low (8%) compared to other groups. The highest number of respondents are non-government employees (23%), and the least number are professionals (13%). Most respondents have an income level in the range of Rs.25,001–Rs.35,000, and there were no respondents whose income level is above Rs.50,000.

Table 3 represents the customer perception towards green products.

According to the data in *Table 3, o*nly 69% of the respondents were aware of green marketing. The remaining 31% were unaware of green marketing and its benefits, which may be due to a lack of effective promotional techniques. Although the majority of the respondents are aware of green marketing and its products, only 58% of the respondents have bought green products and the remaining 42% of the respondents have not bought any green products. Which may be due to a lack of interest and trepidation of buying new products. Most respondents have bought green products for skin care, and only some bought green household accessories, which shows that people are more conscious of their skin and prefer to buy natural products for their skin. 52% of the respondents like to buy green products on a need basis, and 38% of the respondents believe in buying products regularly, whereas 10% of the respondents buy the products rarely. 68% of the respondents have shown a willingness to buy green products whereas 32% of the respondents are not willing to buy green products, which may be due to the expensiveness of the products.

Table 1
Research approach

Data collection	Primary data: The primary data were collected through a direct interview method using a structured questionnaire. Secondary data: The secondary data were collected through research articles, journals, magazines, newspapers and websites.
Sample design	A convenient sampling method was used for collecting the responses from the consumers who are the residents of Kadapa district in Andhra Pradesh.
Sample size	The questionnaire was circulated to 150 respondents through direct interview method and through WhatsApp. 100 responses were received.
Tools used for data analysis	The research has used Microsoft Excel and SPSS Software for analyzing the data.
Statistical analysis	Simple percentage analysis Chi-square analysis

Source: Developed by the authors.

Table 2
Demographic profile of respondents

Variables	Attributes	Frequencies	Percentage of respondents (%)
Gender	Female	35	35
	Male	65	65
	Subtotal	100	100
Age	18–25 Years	28	28
	25–30 Years	32	32
	30–45 Years	18	18
	45–55 Years	15	15
	Above 60 Years	7	7
	Subtotal	100	100
Educational qualification	High School	23	23
	Intermediate	11	11
	Graduate	58	58
	Post graduate and above	8	8
	Subtotal	100	100
Occupation	Government employee	10	10
	Non-government Employee	23	23
	Business	15	15
	Professional	13	13
	Housewife	18	18
	Student	21	21
	Subtotal	100	100
Income	Up to Rs.15,000	18	18
	Rs.15,001-Rs.25,000	40	40
	Rs.25,001-Rs.35,000	26	26
	Rs.35,001-Rs.50,000	16	16
	Above Rs.50,000	0	0
	Subtotal	100	100

Source: Primary data collected by the authors.

Table 4 shows the motivational factors that influence the purchase of green products.

The data in *Table 4* reveal that environmental motives are the most prominent, with 80% of respondents strongly agreeing and none strongly disagreeing, indicating a strong sense of responsibility towards the environment. 63% of the respondents strongly agree, 18% of the respondents agree, 15% of the respondents stay neutral, 4% of the respondents disagree, and none of the respondents strongly disagree with the health concern factor, which makes it second among the other factors, which shows that people are concerned about their health. Improving quality of lifestyle received strongly agreed responses, with 37% and 24% of the respondents disagree and strongly disagreeing collectively, which shows that people are happy with their quality of life with the traditional products they are using. 24% and 20% of respondents strongly agree with need and social status factors, which shows that people are not much interested in purchasing green products for the sake of need or on the basis of social status.

Fig. 1 visualizes the motivational factors influencing the purchase decision for green products.

Table 3
Customer perception towards green products

Particulars		Frequencies	Percentage of respondents (%)
Awareness of green marketing	Yes	69	69
	No	31	31
	Total	100	100
Bought green products recently	Yes	58	58
	No	42	42
	Total	100	100
Types of products bought recently	Food	40	40
	Kitchen accessories	32	32
	Skin care	80	80
	Household accessories	22	22
Frequency of buying green products	Regularly	38	38
	Need basis	52	52
	Rarely	10	10
	Total	100	100
Willingness to buy green products	Yes	68	68
	No	32	32
	Total	100	100

Source: Primary data collected by the authors.

Table 4
Motivational factors influencing the purchase of green products

No	Motivational factors	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	Health concern	63 (63%)	18 (18%)	15 (15%)	4 (4%)	00 (00%)
2	Improving quality of lifestyle	37 (37%)	26 (26%)	13 (13%)	22 (22%)	2 (2%)
3	Environmental motive	80 (80%)	15 (15%)	5 (5%)	00 (00%)	00 (00%)
4	Need	24 (24%)	23 (23%)	10 (10%)	42 (42%)	1 (1%)
5	Social status	20 (20%)	13 (13%)	18 (18%)	38 (38%)	11 (11%)

Source: Primary data collected by the authors.

It is evident that environmental motive is the factor that was selected by the highest number of respondents (80%). Whereas social status is the factor that is least considered by the respondents (20%).

Table 5 shows the reasons for consumers not to use green products.

Among the reasons, expensiveness is the major reason selected by the respondents with the highest responses of 78%. This shows that consumers are backing out of buying green products due to their expensive nature. The outbreak of various brands selling green products has created confusion among people, which is evident from the fact that the fact

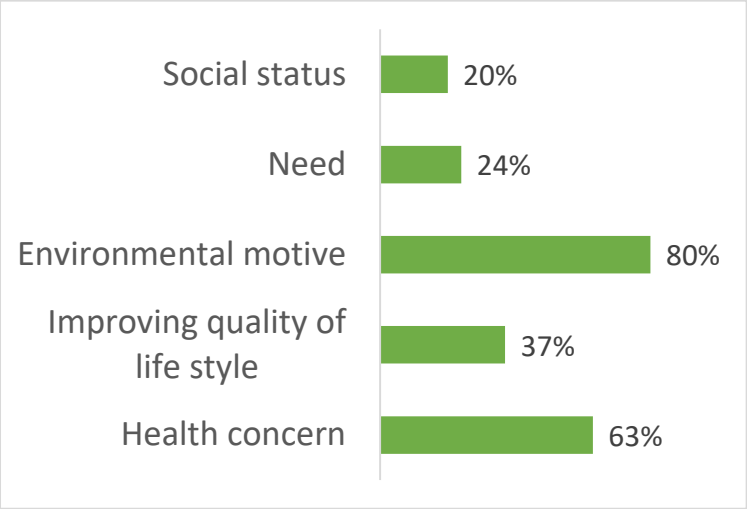

Fig. 1. **Motivational factors influencing the purchase green products**

Source: Developed by the authors.

Table 5

Reasons for non-usage of green products by consumers

No	Reasons	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	Expensiveness	78 (78%)	17 (17%)	5 (5%)	00 (00%)	00 (00%)
2.	Lack of trust	49 (49%)	13 (13%)	24 (24%)	12 (12%)	2 (2%)
3.	Non- availability	19 (19%)	11 (11%)	1 (1%)	45 (45%)	24 (24%)
4.	Lack of knowledge	48 (48%)	14 (14%)	9 (9%)	22 (22%)	7 (7%)
5.	Insufficient varieties	59 (59%)	21 (21%)	10 (10%)	9 (9%)	1 (1%)
6.	Various brands	68 (68%)	16 (16%)	7 (7%)	5 (5%)	4 (4%)

Source: Primary data collected by the authors.

that 68% of respondents strongly agreed with the reason. Insufficient variety has also been a major reason for the non-usage of green products. The respondents also identified lack of trust and lack of knowledge as their top concerns (49% and 48%, respectively). 19% of the respondents feel that green products are available both online and offline, but genuine green products are rare to find.

Fig. 2 shows the reasons for non-usage of green products by the consumers.

According to *Fig. 2*, expensiveness is the top reason with 78%, followed by various brands with 68%, which shows that consumers feel that green products are expensive to buy and also the variety of brands. According to respondents, non-availability is the least responded reason for the non-usage of green products. This may be due to the fact that green products are easily available in online and offline stores, but genuine green products are very rare to find.

Hypothesis testing: Chi-square analysis

The hypothesis testing was performed using the Chi-square method.

H0: There is no association between gender and awareness of green marketing.

H1: There is an association between gender and awareness of green marketing.

Table 6 shows the relationship between gender and awareness of green marketing.

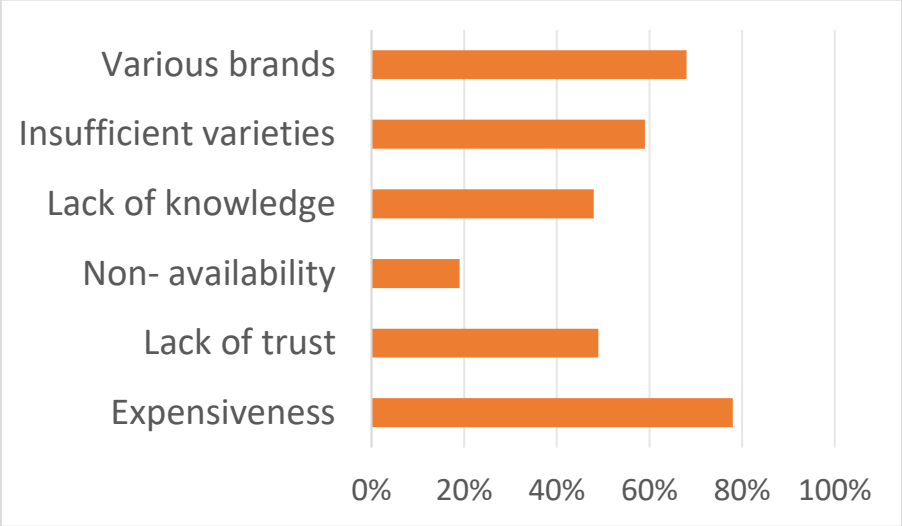

Fig. 2. **Reasons for non-usage of green products**

Source: Developed by the authors.

Table 6

Relationship between gender and awareness of green marketing

Gender	Yes	No	Total
Male	44	21	65
Female	25	10	35
Total	69	31	100
Chi-square = 0.149			

Source: Developed by the authors.

Table 7

Relationship between age group and awareness of green marketing

Age group	Yes	No	Total
Up to 25 years	15	13	28
25–30 Years	22	10	32
30–45 Years	16	02	18
45–55 Years	09	06	15
Above 60 Years	03	04	07
Chi-square = 7.995			

Source: Developed by the authors.

The above table shows the relationship between gender and awareness of green marketing through Chi-square analysis. From the Chi-square test, it is observed that the p-value is 0.6995. $p > 0.05$

Since the p-value is greater than the significant alpha level of 0.05, H0 is accepted and H1 is rejected. Which means that there is no association between gender and awareness of green marketing.

H0: There is no association between age group and awareness of green marketing.

H2: There is an association between age group and awareness of green marketing.

Table 7 shows the relationship between the age group and awareness of green marketing.

The above table shows the relationship between the age group and awareness of green marketing through Chi-square analysis. From the Chi-square test it is observed that the p-value is 0.0047. $p < 0.05$

Since p-value is less than the significant alpha level of 0.05, H0 is rejected and H1 is accepted. Which means that there is an association between age group and awareness of green marketing.

H0: There is no association between income level and awareness of green marketing.

H3: There is an association between income level and awareness of green marketing.

Table 8 shows the relationship between income level and awareness of green marketing.

The above table shows the relationship between the age group and awareness of green marketing through Chi-square analysis. From the Chi-square test, it is observed that the p-value is 0.013406. $p < 0.05$.

Since the p-value is less than the significant alpha level of 0.05, H0 is rejected and H1 is accepted. Which means that there is an association between the income level of the respondents and their awareness of green marketing.

Table 8
Relationship between income level and awareness of green marketing

Income level	Yes	No	Total
Up to Rs.5,000	5	13	18
Rs.15,001–Rs.25,000	25	15	40
Rs.25,001–Rs.35,000	14	12	26
Rs.35,001–Rs.50,000	13	03	16
Above Rs.50,000	0	0	0
Chi-square = 10.7093			

Source: Developed by the authors.

Findings

Sixty-five percent of the respondents are male, and 35% of the respondents are female, which shows that the number of male respondents is higher than that of female respondents. Out of 65 male respondents, 44 are aware and the remaining 21 are unaware of green marketing. Out of 35 female respondents, 25 are aware and the remaining 10 are unaware of green marketing. Chi-square analysis shows that there is no association between gender and awareness of green marketing, indicating that awareness depends on the interests of an individual, irrespective of gender. 32% of the respondents belong to the age group of 25–30 years, and 22% of the respondents from this age group are aware of green marketing. This shows that young people are more interested in green products. There is a correlation between age group and awareness of green marketing. 58% of the respondents are graduates, and 8% of the respondents are postgraduates or older. Most of the graduates are knowledgeable about green marketing. The majority of the respondents are non-government employees (23%), followed by students (21%). 40% of the respondents have an annual income of Rs.25,001–35,000, which helped in studying the lower middle-class income group of consumers. The chi-square analysis shows that there is an association between the income level of the respondents and their awareness of green marketing. 52% of the respondents buy green products on a need basis, whereas 10% of the respondents rarely buy green products. Although 69% of respondents are aware of green marketing, only 58% of the respondents are willing to buy green products. The remaining 11% of the respondents are not willing to buy green products. Environmental motive is the major factor that influences the buying decisions of consumers, according to respondents, which shows that people are more conscious of the environment. According to respondents, the expensiveness of green products is the major reason for their non-use, which shows that customers prefer buying products that are cheaper, irrespective of their quality.

Suggestions

The findings of the research allowed the authors to formulate the following suggestions for the stakeholders to improve the situation with green marketing:

- The government should take initiatives to promote green marketing, as it protects nature and the health of people.
- Companies must use more appealing promotion strategies to attract consumers by making them aware of the benefits of green marketing.
- More innovations are needed in varieties of green products as they limit the purchase patterns of consumers' choices.
- Customer awareness programs must be conducted to promote the benefits of green products among consumers.
- Authentication by official license must be issued for verified and genuine green products to protect the trust of consumers and help identify fake products.
- Companies can increase the sale of green products by offering discounts to customers, which will help customers buy green products and solve the issue of expensiveness.
- The trust of the customers must be preserved by ensuring they receive quality and genuine products.
- There is a need for more varieties of green products, such as school bags, pencils, chalk, and

other stationery items, which will create awareness about green marketing among school-students.

Limitations of the study

We conducted the study in the Kadapa district of Andhra Pradesh state with 100 respondents, capturing the perspective and perception of a limited population within a relatively small area. There is a need for studies to be undertaken in various districts of Andhra Pradesh for a broader perception of customers regarding green marketing and its products. We have tested only three attributes that significantly influence green marketing awareness. The sample size is limited to 100 respondents due to time constraint.

Conclusion

The study concludes that the consumers in Kadapa district of Andhra Pradesh state, India, are aware of green products, but their willingness to buy them is less than their awareness level, which is due to the expensiveness and variety of brands. Green marketing needs more support and motivation from the government authorities by creating financial support and authorized verification, which will facilitate genuine products reaching more consumers at a reasonable price. It inspires more businesses to pursue green marketing. The main motive of green marketing is to protect people from hazardous chemicals that will have a negative impact on their health.

Green marketing will be more effective when there is proper awareness about the benefits of green products. The eco-friendly theme must be educated in children by distributing free samples of green products in educational institutions, which will help in building a positive perspective among students towards green products. More marketing strategies have to be adopted by the companies in promoting green products. The adoption of green products in our daily lives will make our lives shift towards a healthy lifestyle which is crucial for the safety of our health as well as the environment. Make green, buy green and protect green must be the motive.

REFERENCES

1. Bhatia M., Jain A. Green Marketing: A study of consumer perception and preferences in India. *Electronic Green Journal.* 2013;1(36). URL: http://dx.doi.org/10.5070/G313618392
2. Dharmalingam R., Palanisamy V. Consumers' perception towards green products with reference to Vellore District. *International Journal of Engineering and Advanced Technology.* 2019;9(1):5340–5344. URL: http://www.doi.org/10.35940/ijeat.A2970.109119
3. Mathai D.C., Jegan P. Consumer Perception towards Green Marketing. *International Journal of Management.* 2020;11(12):3732–3740. URL: http://doi.org/10.17605/OSF.IO/UCDB 3
4. Unnamalai T., Gopinath R. Brand preferences and level of satisfaction in consuming noodles among working women in Tiruchirapalli district. *International Journal of Management.* 2020;11(11):2909–2917. DOI: 10.17605/OSF.IO/W4XVG
5. Rajalakshmi N., Unnamalai T. Problems and Prospects in Maize Cultivation with reference to Perambalur District — A Study. *International Journal of Management.* 2020;11(11):3044–3053. URL: https://doi.org/10.34218/IJM.11.11.2020.28
6. Vani M. A Study on Consumer Perception Towards Green Marketing with Reference to Bengaluru. *Journal of Positive School Psychology.* 2021;6(3):7391–7400. URL: https://journalppw.com/index.php/jpsp/article/view/4659
7. Kaur K. A Study of Consumers' Perception Towards Green Marketing in Rajasthan. *Pacific University Journal of Social Sciences.* 2022;6(2):37–47. URL: http://www.pjss.ac.in/2022/May/5.pdf
8. Reddy K.P., Chandu V., Srilakshmi S., Thagaram E., Sahyaja Ch., Osei B. Consumers perception on green marketing towards eco-friendly fast moving consumer goods. *International Journal of Engineering Business Management.* 2023;15:1–14. URL: https://doi.org/10.1177/18479790231170962
9. Olipane H.G.E. Consumer Perception towards Green Products. *International Journal of Arts, Humanities and Social Studies.* 2022;4(3):77–85. URL: https://ijahss.in/Archive/vol-4issue-3/IJAHSS 0403041–77–85.pdf
10. Papadopoulos I., Karagouni G., Trigkas M. et al. Green marketing: The case of Greece in certified and sustainably managed timber products. *EuroMed Journal of Business.* 2010;5(2):166–190. URL: https://doi.org/10.1108/14502191011065491
11. Thomas J. A Study on the Impact of Green Marketing Practices on Consumer Buying Behavior in Twin cities. *Joseph's Journal of Multidisciplinary Studies.* 2017;(1):6–10. URL: https://josephscollege.ac.in/pdf/jjmds/A%20Study%20on%20the%20Impact%20of%20Green%20Marketing%20Practices%20on%20Consumer.pdf
12. Nuryakin N., Maryati T. Do green innovation and green competitive advantage mediate the effect of green marketing orientation on SMEs' green marketing performance? *Cogent Business and Management.* 2022;9(1):2065948. https://doi.org/10.1080/23311975.2022.2065948

13. Nagabhaskar M., Chandrasekhar Ch. A Conceptual Study of Service Marketing: Competitive Edge of 7P's over 4P's in Indian. *International Journal of Innovative Research in Engineering and Management.* 2022;9(1):525–528. URL: https://doi.org/10.55524/ijirem.2022.9.1.111
14. Singh P., Kumar A. Green Marketing: It's Impact on Global Market. *International Journal of Novel Research and Development.* 2022;7(5):48–61. URL: https://www.ijnrd.org/viewpaperforall?paper=IJNRD 2205005
15. Sewar A., Kecskes P., Keller V. Green Marketing in the Digital Age: A Systematic Literature Review. *Sustainability.* 2023;15(16):1–16. URL: https://doi.org/10.3390/su151612369
16. Correia E., Sousa S., Viseu C., Larguinho M. Analysing the Influence of Green Marketing Communication in Consumers' Green Purchase Behaviour. *International Journal of Environmental Research and Public Health.* 2023 Jan 11;20(2):1356. DOI: 10.3390/ijerph20021356.
17. Braik A., Saleh Y., Jaaron A.A.M. Green marketing practices and organizational sustainable performance in developing countries context: an empirical study. *Journal of Foodservice Business Research*. 2023;1–41. URL: https://doi.org/10.1080/15378020.2023.2205337
18. Pahuja M. Green Marketing — A Conceptual Study. I*nternational Journal of Engineering Research and Technology.* 2013;1(2). URL: https://www.ijert.org/green-marketing-a-conceptual-study
19. Mathur L.K., Mathur I. An Analysis of the wealth effect of green marketing strategies. *Journal of Business Research*. 2000;50(2):193–200. https://www.sciencedirect.com/science/article/abs/pii/S 0148296399000326
20. Venkatesh R. A Study on Green Marketing: Opportunities and Challenges. *International Journal of Science and Research.* 2019;8(2). URL: https://www.ijsr.net/archive/v8i2/ART20195272.pdf
21. Mishra P., Sharma P. Green Marketing in India: Emerging opportunities and challenges. *Journal of Engineering, Science and Management Education.* 2010;3:9–14. URL: https://www.scribd.com
22. Moser G., Uzzell D. Environmental psychology. In Weiner I., Millon T., Lerner M. (Eds.), Handbook of Psychology, Personality and Social Psychology. 2003. pp. 419–446. URL: https://www.researchgate.net/publication/234167386_Environmental_Psychology
23. Oyewole P. Social Costs of Environmental Justice Associated with the Practice of Green Marketing. *Journal of Business Ethics.* 2001;29(3):239–252. URL: https://philpapers.org/rec/OYESCO
24. Sanjay K.J., Kaur G. Green Marketing: An Attitudinal and Behavioral Analysis of Indian Consumers. *Global Business Review*. 2004;5(2):187–205. URL: https://doi.org/10.1177/097215090400500203
25. Manashi M. A Study on The Green Marketing Practices Adopted by Various Companies in India. International Journal of Marketing and Human Resource Management. 2015;6(3):83–88. URL: http://www.iaeme.com/currentissue.asp?JType=IJMHRM&VType=6&IType=3

ABOUT THE AUTHORS / ИНФОРМАЦИЯ ОБ АВТОРАХ

Kausar Fathima Darga — Ph.D. in commerce, Research Scholar, Department of Commerce, Yogi Vemana University, Kadapa, India
Каусар Фатима Дарга — доктор философии в области коммерции, научный сотрудник, факультет коммерции, Университет Йоги Вемана, Кадапа, Индия
ORCID: 0009-0007-3562-1949
Corresponding author:
kausarfathimakadapa@gmail.com

Vijaya Bharathi Gali — Ph.D. in commerce, Professor, Department of Commerce, Yogi Vemana University, Kadapa, India
Виджая Бхаратхи Гали — доктор философии в области коммерции, профессор, факультет коммерции, Университет Йоги Вемана, Кадапа, Индия
vijayabharathi@yvu.edu.in

Conflicts of Interest Statement: The authors have no conflicts of interest to declare.
The article was submitted on 11.05.2024; revised on 31.05.2024 and accepted for publication on 10.06.2024.
The authors read and approved the final version of the manuscript.

ORIGINAL PAPER

DOI: 10.26794/2308-944X-2024-12-2-17-27
UDC 331.5,378.4,311.2(045)
JEL E24, M1, O15, M48

Analysis of Skills Needed by Unemployed Fresh Graduates in Business Administration: Evidence from Oman

S. Al-Saadi, A. Al-Abri, R. Khairnnas, A. Al-Shukaili
University of Nizwa, Nizwa, Oman

ABSTRACT

The authors consider the increasing unemployment rate for fresh graduates from business administration majors in developing countries, such as Oman. The abilities and skills students need to obtain employment after graduating from postsecondary education institutions are the **subject** of this study. The **aim** of this study was to identify the skills required by the Omani labor market as well as the employability skills gap among recent business administration graduates. The **relevance** of this study relies on proposing an evaluation model to assess the skills required by employers, specifically in the private sector, from fresh graduates of business schools. The authors adopted a quantitative research **method** to achieve the study's objectives. The **data** were collected through a survey which was distributed to 101 fresh graduates from two higher education institutions. The **findings** reveal that soft skills, such as problem-solving, teamwork, dedication to work, a positive attitude, leadership, communication, critical thinking, negotiation, and pursuit of learning, are the most needed by graduates in all aspects. The study **concluded** that there is a demand for different types of soft and technical skills that are important for future jobs in the private sector. The study **recommends** more collaboration between universities and various stakeholders to review current academic programs and design more professional and vocational training programs. Furthermore, the study emphasizes the promotion of an entrepreneurial mindset to prepare graduates to develop creative business ideas and innovation to create their jobs.
Keywords: Oman; fresh graduates; universities; education; soft skills; technical skills; unemployment; training programs; entrepreneurship; job market

For citation: **Al-Saadi S., Al-Abri A., Khairnnas R., Al Shukaili A. Analysis of skills needed by unemployed fresh graduates in business administration: evidence from Oman.** ***Review of Business and Economics Studies*****. 2024;12(2):17-27 DOI: 10.26794/2308-944X-2024-12-2-17-27**

ОРИГИНАЛЬНАЯ СТАТЬЯ

Анализ навыков, необходимых безработным выпускникам в области бизнес-администрирования: данные из Омана

Ш. Аль-Саади, А. Аль-Абри, Р. Хайрннас, А. Аль-Шукаили
Университет Низвы, Низва, Оман

АННОТАЦИЯ

Авторы рассматривают рост уровня безработицы среди недавних выпускников по специальности «бизнес-администрирование» в развивающихся странах, таких как Оман. **Предметом исследования** являются навыки, необходимые студентам для трудоустройства после окончания высших учебных заведений. **Целью** данного исследования было выявить навыки, необходимые на рынке труда Омана, а также пробелы

в навыках, необходимых для трудоустройства среди недавних выпускников по специальности «бизнес-администрирование». **Актуальность** данного исследования обусловлена предложением модели оценки навыков, требуемых работодателями от недавних выпускников бизнес-школ, особенно в частном секторе. Для достижения целей исследования авторы использовали количественный **метод**. Данные были собраны с помощью опроса, в котором принял участие 101 выпускник двух высших учебных заведений. **Результаты** исследования показывают, что «мягкие» навыки, такие как умение решать проблемы и работать в команде, преданность работе, позитивный настрой, лидерство, общение, критическое мышление, ведение переговоров и стремление к обучению, наиболее необходимы выпускникам. Исследование позволило сделать **вывод**, что существует спрос на различные виды «мягких» и технических навыков, которые важны для будущих рабочих мест в частном секторе. Исследование **рекомендует** расширять сотрудничество между университетами и различными заинтересованными сторонами для анализа текущих академических программ и разработки дополнительных программ профессионального обучения. Кроме того, в исследовании подчеркивается важность развития предпринимательского мышления, чтобы подготовить выпускников к разработке творческих бизнес-идей и инноваций для создания рабочих мест.
Ключевые слова: Оман; выпускники; университеты; образование; мягкие навыки; технические навыки; безработица; учебные программы; предпринимательство; рынок труда

Для цитирования: **Al-Saadi S., Al-Abri A., Khairnnas R., Al Shukaili A. Analysis of skills needed by unemployed fresh graduates in business administration: evidence from Oman.** ***Review of Business and Economics Studies*****. 2024;12(2):17-27. DOI: 10.26794/2308-944X-2024-12-2-17-27**

Introduction

The stage of looking for a job opportunity is a critical phase in the lives of fresh graduates who move from education to employment. In developing countries, such as Oman, the young graduates' job seeker rate is a significant concern for the government and other stakeholders due to its negative effects on the country's general economic welfare and level of human resource productivity [1]. According to the International Labor Organization (ILO), the world unemployment rate in 2023 stood at a rate of 5.2%. It was 4.5% for high-income countries compared to 5.5% in upper-middle-income countries. In addition, in 2023, the job rate for women was higher than for men by 3% in upper-middle countries and 2.3% in high-income countries. The figures from World Employment and Social Outlook (WESO) Trends 2024 indicate that the unemployment rate in Arab countries is expected to reach 9.8% in 2024, and for the Gulf Region countries, it is expected to reach 3.5% in the same year. This is due to the lack of skills, poor education and training, and the highest rate of unemployment in Arab countries for the youth population [2]. According to the Oman National Center for Statistics and Information,[1] the unemployment rate in 2024 will reach 3.2%, most of which is observed within the age group of 20–34. What is important in these statistics is that 44.43% of them are university degree holders (30.73% holding a bachelor's degree or higher, 13.7% holding a diploma degree). Recently, Oman's economy has witnessed remarkable growth, and the job market has expanded. However, this growth leads to an increased demand for skilled professionals and poses more challenges for fresh graduates to secure suitable employment opportunities. This raises questions about the adequacy of their skills and the relevance of their education to the current industry requirements. The primary objective of this study is to conduct a thorough analysis of the skills needed by fresh graduates and identify the gaps between their existing skill sets and job market demand.

This study contributes to literature by indicating the skills that are required by fresh graduates from universities in business administration majors. Therefore, the main achievement and contribution to the field can be finding an evaluation model to assess the skills that are required by employers, specifically in the private sector, from the fresh graduates from business schools. Thus, it will help to reduce the gap in understanding the skills required by the private sector on one side and education institutions and fresh graduates on the other side. The findings from this study will provide policymakers in Oman and other stakeholders, including educational institutions and vocational training centers, with the necessary information to align their training programs and curriculum to the job market requirements. This will provide fresh graduates with useful knowledge and skills that enhance their employability

[1] URL: https://portal.ecensus.gov.om/ecen-portal/indicators/65/viewer (accessed on 17.03.2024).

opportunities and make significant contributions to Oman's economy. The educational institutions can review their academic programs and include the employer's required skills in the curriculum.

Literature review

There is a prevalent belief that more education means more employment opportunities. In other words, those who hold a higher education degree are unlikely to be unemployed [3]. This is because a higher level of education serves as a foundational form of training, and universities are a vital supply of future workers [3, 4]. Thus, many students seek prolonged education to avoid unemployment, especially in the current difficult economic climate [5]. Therefore, the objectives of higher education are to expand vocational training for students to achieve outstanding intellectual goals, to access selected institutions, and raise their entry rates in the job market [6, 7]. Moreover, colleges teach students the necessary skills for all job types [8]. Hossain et al. found a significant correlation between graduate characteristics, employability, and job mismatch [9].

However, the annual increase in the number of graduates, particularly those with the lowest degree of education, leads to unemployment among them [10]. This issue has become more prominent during the COVID-19 pandemic [11], and it is more notable in urban areas where competition is high and gender inequalities play a role in women's unemployment [12]. Moreover, many employers have developed specific standards and strong hiring practices for each position, which make it difficult for graduates to find a suitable job [13]. According to WESO Trends 2024 [2], the unemployment rate among youth in Arab countries for women was 39.3% compared with 25.2% for males, and the gender gap between adults was 14.3% for women and 5.5% for males. This indicates that the unemployment rate in Arab countries is higher among adults and women.

According to Noay et al. (2021) [14], employers look forward to graduates with a range of skills and features, such as teamwork, communication, leadership, critical thinking, the ability to work independently, and intellectual and problem-solving skills. This is in addition to other technical skills, such as software proficiency, project management, data analysis, and knowledge of common operating systems. These skills are advantageous for new graduates in obtaining offers from companies. Their research highlights the importance of incorporating the employability skills and qualities of graduates into teaching and learning strategies. Moreover, they call for more collaboration between universities and industry and promote opportunities for students to access work-based learning to obtain relevant employment skills, knowledge, and awareness of employers' culture [14]. Along the same line, according to Okolie et al. (2020), professional self-efficacy and cognitive social behavior help fresh graduates gain more information, skills, and the ability to participate in the labor market successfully [15]. For this purpose, Tilak and Choudhury proposed changes to improve technical education, including hiring experienced teachers and developing a positive learning environment with solid infrastructure such as libraries, classrooms, labs, and contemporary technology [16].

Abd Rahman et al. (2020) have a different opinion as they advocate for preparing graduates to come up with innovative ideas to create their jobs since the trend of graduate unemployment keeps rising and they should see this issue as an opportunity to improve their knowledge and abilities to meet future industrial needs [11]. Ganefri et al. (2020) call for building higher education thinking abilities through project-based learning and promoting entrepreneurship learning via production-based entrepreneurship training models [17]. Al-Harthy and Yusof believe that local employees' performance and retention should be the top consideration when making decisions for localization policies if Oman is to work toward them [18].

Some international reports have highlighted a mismatch between the job seekers' skills and the employer's job requirements. According to WESO Trends 2024, there is a gap between understanding the workers' expectations and the characteristics of the jobs available in the market. This is due to the quality of education that provides the required skills and training to respond to the current needs of the private sector. According to the ILO [2], 68% of job seekers thought there were skills gaps in Oman between employers and job seekers, and 31% of them don't know which skills the employers are looking for. Many of the job seekers in Oman are facing difficulties in finding

jobs based on their current skills attained from their university or college.

Research methods

We adopted quantitative research methods to achieve the study objectives. We conducted a survey that encompasses many dimensions, such as technical skills, knowledge, competencies, and other soft skills, such as communication skills, teamwork skills, and problem-solving skills. The list of skills used in the survey is based on previous studies, e.g., [19, 20, 21].

The questionnaire was administered to a sample of 101 fresh graduates in Business Administration from the University of Nizwa and the University of Technology and Application Science in Nizwa through the Alumni Center. The respondents were asked to rate their skills on a scale of 1 to 5, where 1 meant strongly disagree and 5 meant strongly agree. These skills are diversified in three dimensions: 1) Skills needed after graduation and can contribute to the job opportunity. 2) Skills that enhance job opportunities. 3) Skills that universities should provide to prepare their students to join the job market. In addition, the survey included some other questions related to entrepreneurial opportunities.

We used descriptive analysis to describe demographic data, including age, gender, employment status, graduating from university, educational level, and major. In addition, we used a quantitative analysis approach employing Statistical Package for the Social Sciences (SPSS) software to analyze the reliability and validity of the data. Finally, we used mean scores to rank the relative importance of skills as perceived by fresh business graduates.

Results and discussion

The study started with descriptive analysis to shed light on the characteristics of the surveyed population, including age, gender, work status, number of years since university graduation, educational level, and major. The results are presented in *Table 1*.

Table 1
Descriptive analysis

Characteristics	Responses	
	Frequency	Percentage
Age		
23 or under	35	34.7
24–26	44	43.6
27–29	13	12.9
30 or older	9	8.9
Total	101	100
Gender		
Male	39	38.6
Female	62	61.4
Total	101	100
Employment status		
Graduate student	13	12.9
Employee	12	11.9
Job seeker	70	69.3
Entrepreneur	6	5.9
Total	101	100
Graduating from university		
1 year ago	43	42.6
2 years ago	17	16.8
3 years ago	16	15.8
4 years ago	8	7.9
5 years ago, or more	17	16.8
Total	101	100
Educational level		
Diploma	18	17.8
Bachelor	82	81.2
Master	1	1
Total	101	100
Major		
Business management	40	39.6
Information systems	13	12.9
Accounting	14	13.9
Economics and finance	6	5.9
Marketing	4	4
Human resources	6	5.9
Operation management	2	2
other specify	16	15.8
Total	101	100

Source: Developed by the authors.

Since this study analyzes the needs and preferences regarding skills and job market readiness of young adults who may have recently completed their education or are in the early stages of their careers, the majority of respondents fall in the 24–26 age range and 23 or under (43.6% and 34.7%, respectively), followed by a smaller percentage of age ranges of 27–29 and 30 or older (12.9% and 8.9%, respectively). Data show a higher representation of females with 61.4%, while only 38.6% of respondents identify as male. This may reflect the gender composition of the survey participants. Regarding the work status of respondents, 69.3% of respondents identified themselves as job seekers

Table 2
Reliability tests

	Cronbach's Alpha	N of Items
Skills needed after graduation and can contribute to the job opportunity.	0.967	13
Skills enhance the job opportunity	0.928	10
The skills that universities should prepare their students for to join the job market	0.992	10

Source: Developed by the authors.

and 12.9% as graduate students, while only 17.8% of respondents were employees or entrepreneurs. This aligns with the interest of the study in understanding the needs and aspirations of individuals actively seeking employment. The distribution of respondents based on the number of years since they graduated from university shows a significant proportion of recent graduates. The highest percentage of respondents (42.6%) graduated one year ago, followed by 5 years ago or more (16.8%). This indicates a group of individuals in the early stages of their careers who are likely recent graduates from university and have entered or are about to enter the job market. A Bachelor's degree was the most common education level among the respondents (81.2%), followed by diploma-holders (17.8%). However, only 1% of respondents hold Master's degrees. This highlights that all participants in the survey have completed undergraduate studies. The first majors reported in the results are business management (39.6%), accounting (13.9%) and information systems (12.9%). Other specified majors, such as economics and finance, marketing, human resources, and operations management, have lower percentages, ranging from 2% to 15.8%. This is in line with the study's target group, as respondents to the poll were people with backgrounds in business.

We performed some reliability tests for the three variables. The results are shown in *Table 2*. As we see from the table, Cronbach's alpha coefficients are all close to Alpha = 1 (0.967, 0.928, 0.992). According to Taherdoost (2016) and Hair et al. (2012), these results, as in an exploratory study in the social sciences, indicate that there is an acceptable internal consistency reliability for all multidimensional variables used in the study [22, 23].

As in prior studies, e.g., [24–26], we used mean scores to rank the relative importance of skills perceived by fresh business graduates as needed after graduation and can contribute to the job opportunity, or enhance the job opportunity, or that universities should prepare their students to join the job market. As shown in *Table 3*, graduated students ranked problem-solving, teamwork, dedication to work, a positive attitude during challenges, and management skills as the top five most important skills that they think they need when they graduate and find their job. In terms of skills that can enhance job opportunities, the graduates placed leadership and time management, good communication with customers and suppliers, participation in different academic activities, knowledge of some software programs, knowledge of using Word, Excel and different office tools, as the top five most important skills. Regarding skills that universities should prepare their students to join the job market, the results come as follows. Leadership skills were ranked first, followed by critical thinking in second rank. At the third rank came teamwork skills and technical and computer skills and the fourth rank was shared between motivation skills and improved personal knowledge. The fifth rank was also shared between time management skills and problem-solving skills. Down in the list, personality development skills and communication skills came in sixth and seventh places, respectively.

The participants were asked some other questions to identify skills that they would like to improve and enhance in the future, and to what extent their intention to start their own business if they do not find a job opportunity.

Therefore, the present study confirmed the findings about the need for some types of specialized skills that can satisfy the demands of the labor market in Oman. There is an increase in demand for highly skilled graduates' students who will be capable of meeting the requirements of job specifica-

Table 3
Measurement variables analysis

Variable	Mean	SDev	p_value	Rank
Please specify the skills that you think you need when you graduate and can contribute to finding your job				
Major knowledge level	2.8515	1.26796	0.00*	13
Leadership skills	3.0495	1.29905	0.00*	6
Communication skills	3.0396	1.24837	0.00*	7
Computer and IT	3.0099	1.26882	0.00*	9
Practical experience	2.8614	1.28864	0.00*	12
Analytical and critical thinking	3.0297	1.32254	0.00*	8
Logical analysis	2.8812	1.21068	0.00*	11
Dedication to work	3.2277	1.41337	0.00*	3
Management skills	3.0990	1.36018	0.00*	5
Positive attitude during challenges	3.1485	1.32201	0.00*	4
Technical skills	3.0000	1.27279	0.00*	10
Teamwork	3.2475	1.29156	0.00*	2
Problem solving	3.2970	1.29263	0.00*	1
How can the following factors and skills enhance the job opportunity for graduate students?				
Participation in different academic activities	4.1089	0.94764	0.00*	3
Overall knowledge in business studies activities	3.8812	0.89763	0.00*	8
Knowledge of using Word, Excel and different office tools	4.0792	1.04578	0.00*	5
Personality: (language / critical think / making decisions) important to find a job	3.8812	1.00287	0.00*	8
Knowledge of using some software programs	4.0891	0.92843	0.00*	4
Teamwork	3.9901	0.87744	0.00*	6
Good communication with customers and suppliers	4.1287	0.95565	0.00*	2
Problem solving and decision making	3.9901	0.93268	0.00*	6
Leadership and time management	4.1584	0.96677	0.00*	1
Ability to plan and forecast international changes	3.9703	0.95347	0.00*	7
Skills that universities should prepare their students for to join the job market				
Communication skills	1.4545	0.50252	0.00*	7
Personality development	1.7455	0.43962	0.00*	6
Time management	1.8727	0.33635	0.00*	5
Leadership skills	1.9636	0.18892	0.00*	1
Motivation skills	1.9091	0.29013	0.00*	4
Problem solving	1.8727	0.33635	0.00*	5
Teamwork	1.9273	0.26208	0.00*	3
Critical thinking	1.9455	0.22918	0.00*	2
Technical and computer skills	1.9273	0.26208	0.00*	3
Improve personal knowledge	1.9091	0.29013	0.00*	4

Note: * significant at $p < 0.001$.
Source: Developed by the authors.

tions in the private sector. The findings in *Table 3* illustrate the statistical significance of all the p-values for all skills. The most important skills that students need to find jobs are problem solving, dedication to the work, and teamwork. In addition, leadership and time management, good communication with customers and suppliers, and participation in various academic activities are significant skills that can help students land job opportunities. Overall, all the mentioned skills in the study are important, and the findings of the current study are consistent with the ILO's list of skills needed in Oman's labor market [2], which is recommended for companies in Oman to provide training opportunities for graduates. Furthermore, education institutions and the government should collaborate to indicate the future skills required to be given to students to meet the needs of the future job market.

The results in *Table 4* indicate that a significant portion of respondents, specifically 70.3%, desire to enhance their knowledge in their major area. Other areas include communication skills (56.4%), personality development (46.5%), teamwork and problem-solving (42.6%), motivation skills (47.5%), and technical and computer skills (37.6%), which represent the skills that respondents desire to improve and enhance in the future. Moreover, some other soft skills were pointed out by participants, such as time management (43.6%), critical thinking (38.6%), presentation skills (36.6%), conducting research and studies (33.7%), data analysis (33.7%), negotiation (27.7%), and pursuit of learning (26.7%). This highlights the importance and awareness of respondents of soft skills and personal growth for their future careers. Regarding the question related to the intention of respondents to start their own business if they do not find a job opportunity, the results emphasize the significant interest of fresh graduates to pursue entrepreneurship as an alternative career path with a percentage of 82.2%.

Due to environmental, technological, climate and economic changes, there will be a high generation of future jobs related to the green business transition, big data, technology adaptation, artificial intelligence (AI) and the digitalization of trade and business (Future of Jobs Report (2023), published by the World Economic Forum (WEF).[2] In addition, there will be a growth in jobs that are more focused on e-commerce, environment management technology, cybersecurity, and all jobs related to tech like agriculture technology, financial technology, education technology, etc. Education, agriculture, digital commerce, and trade industries are expected to see growth in job creation in the coming five years. However, administrative jobs are predicted to be reduced, and many jobs will be lost due to the adaptation of technology and automation systems. Therefore, companies in the future are expected to recruit graduates or employees who have analytical thinking skills, creative thinking skills, cognitive skills, self-efficacy skills, motivations, self-awareness, and life-learning skills. In addition, they are looking for candidates who are flexible and can adapt to the environmental and workplace changes. Furthermore, the core skills that will be required more in the future will be those related to teamwork, empathy skills with customer awareness, leadership, active listening and social influence.

Conclusion

The study aims to shed light on the training needs of unemployed fresh graduates in the Business Administration major in Oman and provide actionable recommendations to address the skills gap and enhance their employability.

Previous studies have emphasized the importance and role of higher education and other professional training institutions, as a foundational form of vocational training, indicating that higher education students are unlikely to experience unemployment. However, there are still obstacles that new graduates must overcome in order to enter the workforce. These include the annual increase in the number of graduates, the development of stringent hiring procedures and standards by employers, and their preference for graduates with a diverse range of abilities. A survey was distributed to 101 fresh graduates from the University of Nizwa and UTAS–Nizwa, and the data were analyzed using the SPSS program. The findings show that the skills that ranked higher in all aspects (skills that can enhance job opportunities, skills that universities should teach their students to join the job market, and the skills that fresh graduates would like to improve and enhance in the future) are soft skills: problem-solving, teamwork, dedication to work, a positive attitude,

[2] URL: https://www3.weforum.org/docs/WEF_Future_of_Jobs_2023.pdf (accessed on 20.05.2024).

Table 4
What do you want to improve and enhance in the future?

	Particulars	Frequency	Percentage, %
1	Improve personal knowledge in my major	71	70.3
2	Communication skills	57	56.4
3	Motivation skills	48	47.5
4	Personality development	47	46.5
5	Time management	44	43.6
7	Teamwork and problem solving	43	42.6
8	Critical thinking	39	38.6
9	Technical and computer skills	38	37.6
10	Presentation skills	37	36.6
11	Leadership skills	36	35.6
12	Data analysis	34	33.7
13	Conducting research and other studies	34	33.7
14	Negotiation	28	27.7
15	Pursue learning	27	26.7

Source: Developed by the authors.

leadership, communication, critical thinking, negotiation, and the ability to pursue learning. This reflects the demand for what we call "Future Skills" due to global economic change and technological advancements. However, some technical skills are included, such as technical and computer skills (e.g., software programs, such as Word and Excel), and data analysis.

Interestingly, the results show that most respondents expressed their intention to pursue entrepreneurship as an alternative career path. Our results demonstrated that the most important skills that graduate students need and can contribute to easily finding jobs are problem solving, teamwork, and dedication to work. In Oman, foreign workers dominate the private sector. Therefore, maintaining the required skills for graduates is vital to the government and education institutions. Although *Table 3* ranks the importance of each opinion, it is important to note that there are many different opinions with varying standard deviations when assessing the skills that are required after graduation and demanded by the private sector.

In addition, the analysis of this study concludes that leadership skills, critical thinking skills, and teamwork are the important skills that universities should provide their students to successfully join the job market. According to the recommendations of the World Economic Forum, the Oman government should develop the professional and technical skills of the national workforce, which can help replace the expatriates in the private sector. Enhancing internship training and providing practical experience are the policy tools that can reduce the gap between the national and foreign workforces in their professional skills. It is important to monitor the future jobs market in the Omani and balance the skills required for Omani workforce in order to replace expatriates in the private sector. The unemployment problems in Oman could be due to the saturation of job vacancies available in the public sector, as 86% of total workers in the public sector are Omanis. However, the dominance of foreign workers or investors in the private sector in Oman, who prefer to recruit non-Omanis due to their skills or salary advantages, prevents the private sector from creating more job opportunities for Omanis.

In conclusion, we propose the following recommendations:

1. Prepare graduates with relevant soft skills, self-efficacy, and cognitive social behavior through workshops, seminars, and internships.

2. Emphasize technical skills such as data analysis, programing, project management, and emerging technologies, like artificial intelligence and block chain.

3. Foster collaboration between universities and industry to design curricula and training programs that promote opportunities for students to access real-world-based learning to obtain relevant employment skills, knowledge, and awareness of employers' cultures.

4. Encourage and facilitate internship programs that provide fresh graduates with practical experience and communication with professionals in their field of interest.

5. Promote an entrepreneurship mindset to prepare graduates to come up with creative ideas and innovation to create their jobs via several learning methods, such as production-based entrepreneurship training models.

These recommendations may help educational institutions, policymakers, and even employers prepare suitable curricula and training programs that will empower fresh graduates with the right technical and soft skills, along with a mindset for continuous learning and entrepreneurial creativity and innovation. By implementing these recommendations, Oman can foster a more vibrant and skilled workforce, leading to sustainable economic growth and development.

The limitations of the present study include the small sample size, necessitating cautious generalization of the findings. In addition, due to the size of the sample, and the homogeneity of the data, implementing the ANOVA analysis to check the differences among the skills was not performed in the study.

REFERENCES

1. Ghosh B. Health workforce development planning in the Sultanate of Oman: a case study. *Human Resources for Health*. 2009;7(47):1–15. URL: https://doi.org/10.1186/1478–4491–7–47
2. Tobin S., Horne R., Feist L., Martinez M. S., Kampert R., World Employment and Social Outlook (WESO): Trends 2024. International Labour Organization. 2024:1–113. URL: https://doi.org/10.54394/HQAE 1085
3. Brunello G. Unemployment, education and earnings growth. *Social Science Research Network (SSRN)*. 2001;(273335):1–18. URL: https://dx.doi.org/10.2139/ssrn.273335
4. Ghani E. K., Rappa R., Gunardi A. Employers' perceived Accounting Graduates' soft Skills. *Academy of Accounting and Financial Studies Journal*. 2018;22(5):1–11. URL: https://api.semanticscholar.org/CorpusID:169195336
5. Arkes J. Using unemployment rates as instruments to estimate returns to schooling. *Southern Economic Journal.* 2010;76(3):711–722. URL: https://doi.org/10.4284/sej.2010.76.3.711
6. Hwang Y. What Is the Cause of Graduates' Unemployment? Focus on Individual Concerns and Perspectives. *Journal of Educational Issues*. 2017;3(2):1–10. DOI: 10.5296/jei.v3i2.11378
7. Bastedo M. N., Gumport P. J. Access to What? Mission Differentiation and Academic Stratification in U. S. Public Higher Education. *Higher Education*. 2003;46(3):341–359. URL: http://www.jstor.org/stable/3447507
8. Cacciolatti L., Lee S. H., Molinero C. M. Clashing institutional interests in skills between government and industry: An analysis of demand for technical and soft skills of graduates in the UK. *Technological Forecasting and Social Change.* 2017;119:139–153. DOI: 10.1016/j.techfore.2017.03.024
9. Hossain M. I., Yagamaran K. S. A., Afrin T., Limon N., Nasiruzzaman M., Karim A. M. Factors Influencing Unemployment among Fresh Graduates: A Case Study in Klang Valley, Malaysia. *International Journal of Academic Research in Business and Social Sciences*. 2018;8(9):1494–1507. URL: http://dx.doi.org/10.6007/IJARBSS/v8-i9/4859
10. Matandare M. A. Botswana Unemployment Rate Trends by Gender: Relative Analysis with Upper Middle Income Southern African Countries (2000–2016). *Dutch Journal of Finance and Management.* 2018;2(2):1–13. URL: https://doi.org/10.20897/djfm/3837
11. Abd Rahman N. H., Ismail S., Ridzuan A. R., Abd Samad K. The Issue of Graduate Unemployment in Malaysia: Post Covid-19. *International Journal of Academic Research in Business and Social Sciences*. 2020;10(10):834–841. URL: http://dx.doi.org/10.6007/IJARBSS/v10-i10/7843

12. Berhe A.A., Hastings M., Schneider B., & Marín-Spiotta E. Changing Academic Cultures to Respond to Hostile Climates. In Addressing Gender Bias in Science and Technology. Washington, DC: ACS Symposium Series; American Chemical Society. 2020;1354:109–125. DOI: 10.1021/bk-2020–1354.ch007
13. Nguyen H., Nguyen L.T.B., Nguyen H.N., Le T.H., Do D.T. Critical Factors Affecting Employers' Satisfaction with Accounting Graduates in Hanoi. *The Journal of Asian Finance, Economics and Business*. 2020;7(8):613–623. DOI: 10.13106/jafeb.2020.vol7.no8.613
14. Noay N. Employers' Perceptions of Employability Skills for Graduates of Islamic Business Administration at Saint Islam University Malaysia. *International Journal of Islamic Economics and Finance Research.* 2021;4:41–52. URL: https://doi.org/10.53840/ijiefer47
15. Okolie U.C., Nwajiuba C.A., Binuomote M.O., Ehiobuche C., Igu N.C.N., Ajoke O.S. Career Training with Mentoring Programs in Higher Education: Facilitating Career Development and Employability of Graduates. *Education and Training*. 2020;62(3):214–234. DOI: 10.1108/ET-04–2019–0071
16. Tilak J.B., Choudhury P.K. Employment and Employability and Earnings of Engineering Graduates in India. *Journal of Contemporary Educational Research*. 2021;5(3):24–274. DOI: 10.26689/jcer.v5i3.1825
17. Ganefri G., Hidayat H., Yulastri A., Ifdil I. Need Analysis of the Production Based Entrepreneurship Training Model: Learning Entrepreneurship in Higher Education. *COUNS-EDU: The International Journal of Counseling and Education.* 2020;5(2):58–63. DOI: 10.23916/0020200528530
18. Al-Harthy B., Yusof R., Ali H.A.J. A Conceptual Paper on Compensation and Benefits, Job Security, Work-Life Balance, Employee Retention and Localization in Oman. *Global Business and Management Research*. 2022;14(3):688–710. URL: http://www.gbmrjournal.com/vol14no3s.htm
19. Hosain M.S., Mustafi M.A.A., Parvin T. Factors Affecting the Employability of Private University Graduates: An Exploratory Study on Bangladeshi Employers. *PSU Research Review*. 2021;7(3):163–183. DOI: 10.1108/PRR-01–2021–0005
20. Succi C., Canovi M. Soft Skills to Enhance Graduate Employability: Comparing Students and Employers' Perceptions. *Studies in Higher Education.* 2020;45(9):1834–1847. DOI: 10.1080/03075079.2019.1585420
21. Hwang Y. What is the Cause of Graduates' Unemployment? Focus on Individual Concerns and Perspectives. *Journal of Educational.* 2017;3(2):1–10. DOI: 10.5296/jei.v3i2.11378
22. Taherdoost H. Validity and Reliability of the Research Instrument; How to Test the Validation of a Questionnaire/Survey in a Research. *International Journal of Academic Research in Management*. 2016;5:28–36. URL: http://dx.doi.org/10.2139/ssrn.3205040
23. Hair J.F., Marko S., Christian M. Ringle and Jeannette A.M. An Assessment of the Use of Partial Least Squares Structural Equation Modelling in Marketing Research. *Journal of Academy of Marketing Sciences.* 2012;40:414–433. URL: https://doi.org/10.1007/s11747–011–0261–6
24. Succi C., Canovi M. Soft Skills to Enhance Graduate Employability: Comparing Students Andemployers' Perceptions. *Studies in Higher Education*. 2020;45(9):1834–1847. DOI: 10.1080/03075079.2019.1585420
25. Strong M.H., Gary J.B., Emily.G., Solberg A., William D., Presson and Jean-BernardSeitz. Development and Validation of a Global Competency Framework for Preparing New Graduates for Early Career Professional Roles. *Higher Learning Research Communications.* 2020;10:67–115. DOI: 10.18870/hlrc.v10i2.1205
26. Konig L.S., Helga M.R. Is there a Mismatch Between Employers' and University Teachers' Perceptions on Graduate Employability in Croatia? *Journal of Contemporary Management*. 2019;24:87–102. DOI: 10.30924/mjcmi.24.1.6

ABOUT THE AUTHORS / ИНФОРМАЦИЯ ОБ АВТОРАХ

Sheikha Al-Saadi — Undergraduate Student, Management Department, College of Economics, Management and Information Systems (CEMIS), University of Nizwa, Nizwa, Oman
Шейха Аль-Саади — студентка бакалавриата факультета менеджмента Колледжа экономики, менеджмента и информационных систем (CEMIS), Университет Низвы, Низва, Оман
https://orcid.org/0009-0006-5486-7488
12847568@uofn.edu.om

Amjaad Al-Abri — Undergraduate Student, Management Department, College of Economics, Management and Information Systems (CEMIS), University of Nizwa, Nizwa, Oman
Амджаад Аль-Абри — студентка бакалавриата факультета менеджмента Колледжа экономики, менеджмента и информационных систем (CEMIS), Университет Низвы, Низва, Оман
https://orcid.org/0009-0004-7245-4180
12659075@uofn.edu.om

Rabie Khairnnas — Research assistant, Entrepreneurship Center, University of Nizwa, Nizwa, Oman.
Раби Хайрннас — научный сотрудник Центра предпринимательства, Университет Низвы, Низва, Оман
https://orcid.org/0009-0008-9820-1105
97711995@uofn.edu.om

Abdullah Al-Shukaili — Ph.D. in Management, Head of Management Department and the Executive Director, University of Nizwa Entrepreneurship Center; Assistant Professor at the Management Department, College of Economics, Management and Information Systems (CEMIS). University of Nizwa, Nizwa, Oman
Абдулла Аль-Шукаили — Ph.D. в области менеджмента, руководитель департамента менеджмента и исполнительный директор Центра предпринимательства, Университет Низвы; доцент кафедры менеджмента Колледжа экономики, менеджмента и информационных систем (CEMIS), Университет Низвы, Низва, Оман
https://orcid.org/0000-0002-5206-0828
Corresponding Author
a.alshukaili@unizwa.edu.om

Authors' declared contribution:
Sheikha Mohammed Ali Al-Saadi and ***Amjaad Nasser Salim Al-Abri (both)*** — have contributed to writing an introduction, analysed the literature review and finding the research gap, preparing the research questionnaire, collected the data, and participated in writing the results and the conclusion. They are also compiled the tables, defining the research sources and formulating all the research sections.
Rabie Khairnnas — has participated in conducting the analysis, applied the research method, description of evaluation methods, indicating the key findings, contributed to writing the conclusions of the research and implication of the study, He has also assisted in reviewing the references and formatting and reviewing the manuscript based on the Journal guidelines.
Abdullah Al Shukaili — has assisted and guided the team in defining the research problem and objectives, developing the conceptual framework, developing the indicators corresponding to the model component, participating in writing and reviewing the whole study's sections, and writing the abstract.

Conflicts of Interest Statement: The authors have no conflicts of interest to declare.

The article was submitted on 16.04.2024; revised on 25.05.2024 and accepted for publication on 03.06.2024. The authors read and approved the final version of the manuscript.

ORIGINAL PAPER

DOI: 10.26794/2308-944X-2024-12-2-28-41
UDC 334.7,338.246.2(045)
JEL H53, H54, D61, E60, O22, P35

Critical Success Factors of Public-Private Partnership (PPP) Implementation: A Study in Bangladesh

Z. Mannan[a], F. Ahmed[b], Md.M. Uddin[b]
[a]Bangladesh Open University, Gazipur, Bangladesh;
[b]University of Dhaka, Dhaka, Bangladesh

ABSTRACT

This study **aims** to discover the perceptions of the critical success factors (CSFs) of the public and private sectors' players that influence the implementation of public-private partnership (PPP) infrastructure projects in Bangladesh. **Methods:** A questionnaire survey was adopted to discover public and private sector players' perceptions of the CSFs and success subfactors (SSF) of PPP projects. Based on the literature review, CSFs and SSFs were identified, and the agreement between respondents from the public and private sectors was tested. A total of 59 responses were collected and examined to reveal the perceived gaps between sectors and rank CSFs and SSFs. The Statistical Package for the Social Sciences (SPSS) software was used. The **results** show that the top-ranking factor was "economic viability", followed by "appropriate risk allocation", "sound financial packages", "favorable investment environment", and "reliable concessionaire". It was also found that the perceptions of the public and private sectors were mixed. **The key conclusion** of this study is that the identified factors must be effectively addressed in order to develop consensus and engage relevant stakeholders in Bangladesh.
***Keywords*:** public-private partnership; critical success factors; success subfactors; Bangladesh; public sector; private sector; infrastructure projects

For citation: **Mannan Z., Ahmed F., Uddin Md.M. Critical success factors of public private partnership (PPP) implementation: A Study in Bangladesh.** ***Review of Business and Economics Studies*****. 2024;12(2):28-41. DOI: 10.26794/2308-944X-2024-12-2-28-41**

ОРИГИНАЛЬНАЯ СТАТЬЯ

Критические факторы успеха реализации государственно-частного партнерства (ГЧП): исследование в Бангладеш

З. Маннан[a], Ф. Ахмед[b], Мд. М. Уддин[b]
[a]Открытый университет Бангладеш, Газипур, Бангладеш;
[b]Университет Дакки, Дакка, Бангладеш

АННОТАЦИЯ

Целью данного исследования является выявление восприятия критических факторов успеха (КФУ) участников государственного и частного секторов, которые влияют на реализацию инфраструктурных проектов государственно-частного партнерства (ГЧП) в Бангладеш. **Методы:** для выявления представлений участников государственного и частного секторов о КФУ и подфакторах (факторов более низкого уровня) успеха (ПФУ) проектов ГЧП был использован анкетный опрос. На основе обзора литературы были выявлены СФУ и ПФУ, а также было проверено соответствие между ответами респондентов из государственного и частного

секторов. Было собрано и изучено 59 ответов с целью выявления предполагаемых различий в восприятии различных секторов и ранжирования СФУ и ПФУ. Использовалось программное обеспечение статистического пакета для социальных наук (SPSS). **Результаты** ранжирования показывают, что на первом месте оказался фактор «экономическая жизнеспособность», за которым следуют «надлежащее распределение рисков», «надежные финансовые пакеты», «благоприятные инвестиционные условия» и «участие надежного концессионера». Также было установлено, что восприятие государственного и частного секторов неоднозначно. Основной вывод данного исследования заключается в том, что необходимо учитывать выявленные факторы для достижения консенсуса и оптимального привлечения заинтересованных сторон в Бангладеш.
Ключевые слова: государственно-частное партнерство; критические факторы успеха; подфакторы успеха; Бангладеш; государственный сектор; частный сектор; инфраструктурные проекты

Для цитирования: **Mannan Z., Ahmed F., Uddin Md.M. Critical success factors of public private partnership (PPP) implementation: A Study in Bangladesh.** ***Review of Business and Economics Studies*****. 2024;12(2):28-41. DOI: 10.26794/2308-944X-2024-12-2-28-41**

1. Introduction

Public-private partnerships (PPPs) are becoming an increasingly popular option for policymakers when it comes to delivering major public projects, particularly in the face of limited government financial resources and the need to combat governmental inefficiencies [1, 2]. To develop infrastructure, the Government of Bangladesh (GoB) shows great interest in PPPs to develop infrastructure. According to the Sustainable Development Goals' (SDGs) Financing Strategy, an additional amount of 928.48 billion US dollars is required to reach the target.[1] GoB has identified five possible sources of funding SDGs to meet the 17 goals by 2030. Out of the 85% domestic financing, PPPs have a target of 5.5%.[2] As a result, with the private sector contributing 42% and PPP accounting for 5.5%, nearly half of total SDG financing is expected to come from the private sector. Therefore, the GoB must play a significant role in attracting private capital and fostering an environment that will enable them to bring in the necessary investment to meet the nation's SDG targets.

In developing countries, governments are resorting to PPPs to address the investment shortfall, particularly in infrastructure development [3]. The PPP Authority of Bangladesh assists Line Ministries and Contracting Authorities in developing and implementing PPP projects. There are 77 projects in the PPP pipeline that are in various phases of development. The expected total investment amount is USD 38.77 billion. With two additional PPP contracts signed in 2022, the total number of signed PPP contracts stands at 17, with an anticipated investment of USD 4.5 billion.[3] One of them is operational, while the other nine projects are under construction. Reports indicate that 19 projects are currently in the procurement stage, while 40 projects are in various stages of project development. Despite the growing popularity of PPPs, there is a scarcity of research on the success factors of PPP application in Bangladesh. To effectively implement and deliver the planned infrastructure projects, sound knowledge on CSFs related to PPPs is needed [4].

Public works and services are no longer seen as being solely provided by the government. Private finance initiatives (PFIs), or public-private partnerships, have been acknowledged as significant methods of resolving issues that governments have in delivering infrastructure systems [5]. To reduce the burden on governmental budgets, a remarkable movement has been observed toward the participation of the private sector to develop public infrastructure as well as services [6, 7]. This tendency has been influenced by several factors, including lack of resources, deregulation of infrastructure, and the impact of international markets. This tendency has led to an increase in the importance of private financing.

In long-term PPP arrangements, it is found that there are immense risks and uncertainties, engagement of many partners, absence of knowledge, lack of experience and expertise in PPP in many areas, and varied issues emerging globally, which have surprising effects. Nevertheless, a practical and effective procurement strategy is urgently required to improve procedures in

[1] PPP Authority. Annual report 2021–22. Dhaka, Bangladesh: Government of the People's Republic of Bangladesh; 2021. See https://www.pppo.gov.bd/download/ppp/ar/PPPA_Annual-Report_2021–22.pdf

[2] Ibid.

[3] ADB. Public private partnership monitor: Bangladesh. Asian Development Bank, Manila; 2022. URL: http://dx.doi.org/10.22617/SGP220554–2

upcoming PPP projects, given the global trend toward PPPs. The process of identifying, analyzing, and classifying many elements that are crucial to the overall performance of PPPs is a crucial stage in the construction of such a protocol. The achievement of an infrastructure project's goals depends on a variety of variables, including cost, timeliness, and quality [7]. The identification of the critical success factors (CSFs) for these goals will enable the efficient distribution of scarce resources. The CSFs can be determined using either quantitative measurements or professional opinion [8]. An analytical hierarchy technique is used, for instance, by Chua et al. [8] to poll professional opinions on CSFs for construction projects.

According to Marks and Sparkman's study [9], PPP is defined as a collaborative engagement of non-state actors in the infrastructural development or service provision of public agencies to achieve win-win gains. With the expeditious change of market in the fastest-growing economy of Bangladesh, an inevitably competent PPP method is needed, which can be implemented to develop various sectors, industries, and infrastructure to meet the needs of its population. The success of PPP depends on key, specific factors known as critical success factors (CSFs). Central to effective PPP implementation are CSFs, which guarantee success during the planning, identification, and evaluation stages while also molding an organizational culture of excellence [10]. This study attempted to ascertain these factors, which are indispensable for PPP projects in Bangladesh. The purpose of this research is to find appropriate CSFs and success subfactors (SSFs), i.e., factors of lower level, for PPP projects in Bangladesh. An effort was also made to provide a road map for the successful delivery of the PPP projects.

2. Literature review

The main objective of PPP in Bangladesh is to ensure a faster, more inclusive economic trajectory and to better meet the demand for improved, high-quality public services while maintaining fiscal viability.[4] The Government of Bangladesh has continuously reviewed and revised the PPP arrangements for the enormous expansion of PPP implementation in Bangladesh in order to enhance current practices and ensure the attainment of its conclusive target. It requires enhancing PPP practices, which gives rise to this study that emphasizes the CSFs for effective PPP projects in Bangladesh.

The "success factor" concept was first developed by Daniel [11]; later, Rockart [12] refined that process into critical success factors between 1979 and 1981 [13, 14, 15]. Johnson and Friesen applied this concept to many sectors in 1995 [16]. Rocakart [15] stressed that project success depends on how much attention organizations give to CSFs. As understood from the study of Zhang [9], five CSFs for PPP in the development of infrastructure are crucial: economic viability, risk allocation, financial instruments, concessionaire consortium, and favorable investment environment. Besides Zhang, several researchers identified CSFs for different types of PPP. In negotiations and competitive tendering for Build-Operate-Transfer (BOT) contracts, Tiong [17] in his study pointed out six CSFs for private sector players: entrepreneurship and leadership; identification of right project; structure of consortium; transfer of technology; different financial packages; and strong guarantees. A study [18] conducted in China on the BOT project identified eight CSFs, including "identification of right project; stable political and sound economic situation; diversified financial package; level of toll or tariff; risk allocation; selection of right subcontractors; control of management; and transfer of technology". Another study [13] was conducted on Accor Stadium (former Stadium Australia), which was constructed through the PPP mechanism of build-operate-own-transfer (BOOT). He identified 15 success factors, and the most significant CSFs include: compatibility skills among the key parties, technical innovation to overcome project complication, and efficient approval process. Other important CSFs include environmental impact, legal and economic framework, political stability, right project, strategic alliances, efficient resource management, trust, support from community, feasibility study, technology transfer, financial competence, and structure of consortium. He argued that private investment initiatives do not automatically lead to success in an infrastructure project. He further added that the win-win principle is the foundation of the success of PPP projects. Again, a study [19] was conducted on a BOOT scheme to analyze the

[4] Public Private Partnership Act 2015.1422/16. URL: https://www.pppo.gov.bd/download/ppp_office/PPP_Law_2015_(Approved_Translation).pdf

CSFs. The study reflected the same CSFs and added new factors: "negotiation, client brief or outcome, feature of bid, business diversification, viability of business, competition, credit rating, teamwork, present infrastructure, asset delivery, growth of investment, and identification of project" [19].

Zhao et al. [20] evaluated the CSFs of two PPP power projects that used the BOT scheme. He identified 31 success factors and found that 3 factors are crucial: "the necessity of the project, expected debt-paying ability, and financial capacity of contractor". Moreover, he asserted that specific CSFs apply to each project individually: "project financing management of the contractor (project company) and efficiency of business operation and qualification of the contractor, competency of personnel, investment capacity of the contractor, profitability of the project, and legal environment". The study conducted by Almeile et al. [21] revealed that the three most often cited reasons for PPP projects in developing nations were 'appropriate risk distribution and risk-sharing', 'political backing', and 'the private sector's financial strength'.

A factor analysis approach was used by Li et al. [14] to discover CSFs in PPP projects for the UK construction sector. He found that "effective procurement process; ability of project implementation; guarantee from the government; sound and stable economic conditions; and availability of financial market" are the key success factors for the PPP project.

In the case of built environment, most studies on PPPs have focused to a large extent on five issues: (1) risks allocation; (2) relationships among the parties; (3) critical success factors; (4) challenges of PPP; and (5) financing/value for money. After a substantial literature review was conducted, it was found that the most arguable issue was gaining "value for money" because it is a lavish and prolonged procedure that thus needed adequate expertise and capability in finding the right projects for PPP, the right private sector player, the ability of risk management, and the management of all participants [22]. These issues made PPP popular. Many developed and developing countries, such as Bangladesh, believe that PPP can be an option to reduce the economic burden. Other reported issues include encouraging private player innovation and managerial expertise, risk allocation, value for money, and timely service delivery, to name a few. Almeile et al. [23] conducted a study in Saudi Arabia and found that economic imperatives, not political imperatives, influence the association between CSFs and the performance of public-private partnership projects in that country.

Most research concentrated on the influence of CSFs in developed countries, for example, Li et al. [14] and Algarni et al. [6] broadly in the United Kingdom and United States, and Cheung et al. [24] in Hong Kong. In spite of the emergence of PPP studies within developing countries, particularly in South Asia and countries such as Pakistan and India, Bangladesh remains at a strategic stage to develop and establish legal frameworks, fostering project plans, ideas, and hubs for PPP units. Insufficient research has been found that addresses CSFs in the South Asian context.

Furthermore, most PPP studies in Asia have used survey tools from developed countries. To fill that gap, this study examines the CSFs that influence the implementation of PPP projects in Bangladesh.

3. Aims and objectives

This study aims to discover the understanding and perceptions of players involved in the public and private sectors regarding the CSFs that influence the application of PPP projects in infrastructure in Bangladesh. To achieve the overall objectives, two specific objectives have been established. First, it aims to identify and assess the criticality of success factors (CSFs) required for PPP projects, and second, the study intends to identify and evaluate the significance of PPP success subfactors.

4. Methodology

4.1. Research instrument

One of the key messages from the reviewed literature is that there is a need to identify the critical success factors of PPP in Bangladesh. It is important to note that PPPs are often difficult to assess clearly. The success of a PPP project depends on CSFs. Initial factors were identified based on a comprehensive review of similar previous studies. Based on the comprehensiveness of the criteria and the recommendations of PPP experts, the authors used the factors identified by Zhang [7]. Given its extensive use in gathering expert opinions in construction management research [7], this study employed a questionnaire survey to gather data on CSFs for PPPs. Discussions with

participants in PPP projects, including government officials, construction and operation managers, architects, developers, and engineers, led to the development and refinement of the questionnaire.

4.2. Sample and collection procedures

One hundred twenty questionnaires were administered using the non-probability sampling technique. In total, 59 usable responses were received. The completed questionnaires were collected via email and postal service. To reduce the impact of the unacceptable sample on the overall sample, mail returned due to wrong or incomplete addresses, participants who no longer had the job, participants who were out of the office, and participants with little or no PPP knowledge were all taken into consideration as ineligible and were excluded from the final analysis.

4.3. Data analysis

Participants were requested to rate the indicators for CSFs and SSFs according to the five-point Likert scale. Values 0 through 5 were specified as being 'not applicable' to 'extremely critical', respectively. The Statistical Package for the Social Sciences (SPSS) software was used to analyze the data. Five-point Likert scale data were analyzed for the importance of each of the success factors using descriptive statistics by way of mean. Afterward, as considered by the overall respondents and by the public and private player groups individually, factors were classified according to their importance.

5. Findings and discussion

In this section, the results of the analysis and how they relate to the literature review will be discussed. The study entailed finding and analyzing the CFSs that influence PPPs, as well as developing a framework that would serve as a direction for both the state and non-state sectors in Bangladesh.

Table 1 illustrates the criticality indexes and rank of the five main success factors based on the overall respondents, state sectors, and non-state sectors. The index, known as criticality, of each success factor was computed as follows:

$$CI = (5n_5 + 4n_4 + 3n_3 + 2n_2 + 1n_1) / 5(n_5 + n_4 + n_3 + n_2 + n_1).$$

Note: CI = Criticality Index, where n_5 = extremely critical, n_4 = very critical, n_3 = critical, n_2 = fairly critical, and n_1 = not critical.

The index of success subfactors (SSFs) was calculated through formula proposed by Zhang [7]. In this formula, "5", "4", "3", "2", "1", and "0" have significance indexes of 100, 80, 60, 40, 20, and 0, respectively.

$$SI = (0R_{i0} + 20R_{i1} + 40R_{i2} + 60R_{i3} + 80R_{i4} + 100R_{i5})/ (R_{i0} + R_{i1} + R_{i2} + R_{i3} + R_{i4} + R_{i5}).$$

Note: SI = "Significance Index" where R_{i0} = "number of responses as '0' for the *i*th factor or subfactor"; R_{i1} = "number of responses as '1' for the *i*th factor or subfactor"; R_{i2} = "number of responses as '2' for the *i*th factor or subfactor"; R_{i3} = "number of responses as '3' for the *i*th factor or sub factor"; R_{i4} = "number of responses as '4' for the *i*th factor or subfactor"; R_{i5} = "number of responses as '5' for the *i*th factor or sub factor".

5.1. CSFs of PPP implementation

It was found that the "economic viability" factor was graded top by both the public and private sector players (0.897 and 0.883, respectively), where "favorable investment environment" was graded lowest by the private sector (0.613) and graded 4 by the public sector (0.785). Many governments conduct economic viability analyses to ascertain if a proposed project is worthy of the use of state resources. A project is economically feasible when its economic advantages exceed its economic costs.[5]

The World Bank[6] also noted that the value-for-money analysis of PPP and financial modeling will both benefit from the initial inputs of the cost and demand estimations created for the economic viability assessment. Furthermore, El-Kholy et al. [25] argued that the economic, political, and administrative circumstances of the host country have a significant impact on the key risk variables of economic viability.

It is evident from *Table 1* that respondents ranked all 5 CSFs as either "extremely critical" or "very critical" for the successful implementation of PPP projects. Respondents believed that two factors are "fairly critical" for the success of a project are reliable concessionaire consortium and a favorable investment environment.

As shown in *Table 1*, "appropriate risk allocation" is the second most important success factor for PPPs in Bangladesh. A survey [14] was carried out in the UK to assess the relative impact of eighteen possible CSFs. The investigation concluded

[5] Success factors for private engagement in FCS. World Bank; November 1, 2022. URL: https://ppp.worldbank.org/public-private-partnership/success-factors-private-engagement-fcs

[6] Ibid.

Table 1
Perception of interviewee regarding the relative importance of CSFs of PPP

Success factors	Public Sector		Private Sector		Overall Respondents	
	C.I.	R.	C.I.	R.	C.I.	R.
"economic viability"	.897	1	.883	1	.889	1
"appropriate risk allocation"	.881	2	.807	2	.839	2
"sound financial package"	.833	3	.783	3	.805	3
"reliable concessionaire consortium"	.769	5	.765	4	.685	5
"favorable investment environment"	.785	4	.613	5	.767	4

Note: C.I. = "criticality index", R.= "ranking"

Source: Data collected by the authors.

that appropriate risk allocation is one of the three most important factors. Through the systematic research approach, Zhang [7] pointed out numerous CSFs that were analyzed to a greater extent and classified into five main CSFs, these are "favorable investment environment", "economic viability", "reliable concessionaire consortium with strong technical strength", "sound financial package", and "appropriate risk allocation". The results illustrate an acceptable level of agreement in the ranking of this factor between respondents from the public and private sectors and overall respondents.

As illustrated in *Table 1*, the third highly critical factor, ranked by the respondents, is "sound financial package". Zhang, Tiong, and Li, et al. [7, 17, 14] highlighted in their research how this factor is important to implement PPP projects. The viability of a PPP project is typically more influenced by the financial package than by the physical design or the cost of construction. Zhang [7] drew ten elements and recommended including these elements to make effective financial packages. These are: "sensible schedules for investment, payment, and drawdown"; "financial analysis"; "appropriate combination of financing sources and standby facilities"; "high equity-debt ratio"; "stable currencies of debts and equity finance"; "low financial charges"; "fixed and low interest rate financing"; "long-term debt financing that minimizes refinancing risk"; "ability to deal with fluctuations in interest and exchange rates"; and "appropriate payment structures".

We can learn from *Table 1* that factors were ranked significantly differently by the public and private sector players. Public sector players believe that the "reliable concessionaire consortium" factor is not as important as other factors that influence the implementation of PPP projects. They ranked this factor fifth, whereas private sector players ranked fourth. The same dissimilarities are shown in the factor "favorable investment environment". In this case, public sector players ranked this factor fourth and fifth by private sector players. The result does not imply that these two factors are not critical factors for effective application of PPPs in Bangladesh; perhaps in this case the ongoing political condition in Bangladesh is well balanced and PPPs are supported by the government, which means these success factors are perceived as less critical. PPP projects can be successful when the investment environment for private sector participation is adequately enhanced and favorable, as demonstrated by the Pamir Private Power Project in Tajikistan.[7]

5.2. SSFs of PPP implementation

Public sector, private sector, and overall responses are depicted in *Table 2*. It also summarizes the significance indexes as well as how respondents ranked the SSFs. The SSF "stable political system" under a favorable investment environment was regarded as an indispensable (94%) influencing factor for the implementation of PPPs, especially in infrastructure. Despite the fact that there are many SSFs ranked differently by the public and private sector players, both

[7] Assessing project feasibility and economic viability. World Bank; June 24, 2022. URL: https://ppp.worldbank.org/public-private-partnership/assessing-project-feasibility-and-economic-viability

sector players ranked "stable political system", "favorable economic system", and "predictable risk scenarios" as essential SSFs for successful PPP application. Correspondingly, the factor "promising economy" was ranked eleventh by both sector players.

Research has proven that "economic viability" plays a crucial role in the success of PPP projects. To succeed, this factor is dependent on a number of subfactors [7]. *Table 2* demonstrates that public and private players' perceptions of the SSFs of PPP applications in Bangladesh do not significantly differ. When it comes to factors such as "long-term cash flow" and "sufficient profitability to attract investors," both sector players exhibit slight differences. The public sector players viewed the factor "long-term cash flow" more critically than the private sector players. On the other hand, private sector players perceived the factor "sufficient profitability to attract investors" as more critical than public sector players.

In general, while the government is in a good position to foster non-state engagement to develop public infrastructure, non-state players play a crucial role in the successful application of PPPs [7]. Choosing the right concessionaire is critical to the effective implementation of the PPP project. *Table 2* depicts that under the CSF "reliable concessionaire consortium", nine SSFs out of twelve were ranked differently by both sectors. The last three SSFs ("partnering skills", "innovative technical solution", and "rich experience in international PPP project management"), both sectors ranked them as the same. The findings indicate that the concessionaire ought to have sound managerial skills. The analysis also portrayed that other subfactors, for example, leading role by the entrepreneur or enterprise, an effective project organization structure, strong relationships with government agencies or authorities, skills in partnership, sound experience in international PPP project management, multidisciplinary participants, and a strong project team, are needed to build a reliable concessionaire consortium.

It is considered that the financial package is the most important CSF for the successful application of PPPs in Bangladesh. *Table 2* illustrates that both sector players perceived all SSFs as important to a great extent and ranked them almost in the same fashion. The tendency indicates that the financial package has an immense influence on the viability of the PPP project. Zhang [7] recommends that a sound financial package should comprise all SSFs to speed up the capital expenditure of an infrastructure project.

Evidently, there are various risks associated with PPP projects. Hence, risk allocation is important for PPP risk management. This study found quite a different picture on the "appropriate risk allocation" factor. From *Table 2*, a level of difference was noted among respondents relative to their opinion about suitable risk allocation. The "concession agreement" factor was ranked top by both sector respondents. Respondents from both the public and private sectors significantly agreed that the agreement of shareholders, insurance, and supply is mandatory, and consecutively, the design and construction contract is an impactful factor for PPP projects. It is noteworthy that the percentage of significance is 59.3%, which is the lowest among all. This confirms that each SSF listed is significant; hence, these are critical to the success of PPPs.

5.3. Agreement analysis

By using Spearman's rank correlation coefficient (r_s), sequential rank agreement analysis was performed between public players and private players to compare the agreement in the ranking of these factors between the two groups. The value of r_s denotes agreement between the two groups. r_s of zero indicates absolute disagreement, whereas r_s of one indicates absolute agreement. *Table 3* and *Table 4* exhibit the success factors and success subfactors of r_s, respectively. It should be noted that the lowest r_s is 0.74 which confirms that there is a well-balanced agreement in ranking between two groups, that is, the public sector players and the private sector players.

6. Conclusion

This study investigated five CSFs suggested by Zhang [7] for successful PPP applications in Bangladesh. The results indicate that all these factors were graded as either "extremely critical" or "most critical". The analysis revealed economic viability as the top-ranked factor. Based on both sector rankings, the results are

Table 2
Summary of responses on significance indexes of SSFs under respective CSFs

Success subfactors	Public Sector		Private Sector		Overall	
	S.I.	R.	S.I.	R.	S.I.	R.
Favorable investment environment						
"stable political system"	92.5	1	94.7	1	94.0	1
"favorable economic system"	91.7	2	88.3	2	89.7	2
"government support"	89.3	3	79.0	4	83.3	3
"the project is in public interest"	84.5	4	74.7	6	81.3	4
"predictable risk scenarios"	83.7	5	78.3	5	80.5	5
"the project is well suited for privatization"	81.3	6	81.3	3	79.0	6
"adequate local financial market"	79.7	7	67.1	8	75.0	7
"predictable and reasonable legal framework"	79.0	8	72.0	7	72.5	8
"supportive and understanding community"	73.3	9	62.0	10	67.3	9
"predictable currency exchange risk"	70.1	10	65.3	9	66.7	10
"promising economy"	60.5	11	60.1	11	62.3	11
Economic viability						
"long-term demand for the products/services"	87.7	1	88.3	1	88.1	1
"long-term cash flow"	86.1	2	85.3	3	85.7	2
"sufficient profitability to attract investors"	84.5	3	86.5	2	85.7	3
"long-term availability of suppliers"	67.7	4	74.7	4	71.7	4
"limited competition from other projects"	59.0	5	69.0	5	64.7	5
Reliable concessionaire consortium						
"good relationship with host government authorities"	89.3	1	82.0	2	85.1	1
"strong and capable project team"	86.1	3	84.1	1	85.1	2
"leading role by a key enterprise or entrepreneur"	87.7	2	80.6	3	83.7	3
"effective project organization structure"	79.7	5	78.3	4	79.0	4
"sound technical solution"	80.5	4	73.1	7	76.1	5
"cost-effective technical solution"	77.3	6	74.7	5	76.0	6
"low environmental impact"	76.5	7	74.1	6	75.1	7
"public safety and health considerations"	65.3	9	72.0	8	70.5	8
"multidisciplinary participants"	69.3	8	71.3	9	69.1	9
"partnering skills"	62.1	11	69.4	11	69.1	10
"innovative technical solution"	66.1	10	71.3	10	66.3	11
"rich experience in international PPP project management"	57.3	12	60.7	12	59.3	12

Table 2 *(continued)*

Success subfactors	Public Sector		Private Sector		Overall	
	S.I.	R.	S.I.	R.	S.I.	R.
Sound financial package						
"appropriate toll/tariff level(s) and suitable adjustment formula"	92.5	1	85.3	1	88.3	1
"abilities to deal with fluctuations in interest/ exchange rates"	87.0	2	83.7	2	83.7	2
"sound financial analysis"	81.3	3	83.1	4	82.3	3
"investment, payment, and drawdown schedules"	79.7	4	78.3	5	80.5	4
"sources and structure of main loans and standby facilities"	76.5	5	83.6	3	79.0	5
"long-term debt financing that minimizes refinancing risk"	75.7	6	77.1	6	76.5	6
"stable currencies of securitization (debts and equity finance)"	72.5	7	76.7	7	74.0	7
"fixed and low interest rate financing"	69.3	8	72.5	8	71.1	8
"low financial charges"	60.5	9	70.1	9	66.1	9
"high equity/debt ratio"	57.3	10	70.1	10	64.7	10
Appropriate risk allocation						
Suitable and dependable risk allocation in:						
"concession agreement"	85.3	1	80.7	1	82.7	1
"off take agreement"	77.3	3	72.5	7	79.0	2
"guarantees/support/comfort letters"	80.5	2	77.7	3	78.3	3
"loan agreement"	76.5	4	79.5	2	75.5	4
"shareholder agreement"	75.0	5	73.7	5	76.5	5
"operation agreement"	73.3	7	77.1	4	74.1	6
"insurance agreement"	74.1	6	73.7	6	74.0	7
"design and construct contract"	69.3	8	62.0	8	65.1	8
"supply agreement"	64.5	9	58.3	9	61.0	9

Note: S.I. = "significance index, R.= "ranking".

Source: Data collected by the authors.

mixed. Although both public and private sector players ranked success factors and success subfactors differently, similarity was found in the ranking of a few factors.

Despite the differences in ranking between the public and private sectors, this indicates the diverse roles and responsibilities performed by each sector in the application of the PPP project in Bangladesh. Furthermore, the disparity in perception between the public and private sectors advocates a gap in perception between the two sectors. This gap must be effectively addressed to foster consensus and involve relevant stakeholders in Bangladesh.

Table 3
Agreement analysis of ranking CSFs

Success factors	Public Sector		Private Sector		Agreement analysis
	S.I.	R.	S.I.	R.	
"economic viability"	0.895	1	0.882	1	
"appropriate risk allocation"	0.879	2	0.806	2	
"sound financial package"	0.831	3	0.782	3	**r_s = 0.89**
"reliable concessionaire consortium"	0.767	5	0.764	4	
"favorable investment environment"	0.783	4	0.612	5	

Note: C.I. = "criticality index, R.= "ranking", r_s = "Spearman's coefficient of rank correlation".

Source: Data collected by the authors.

Table 4
Agreement analysis of ranking SSFs

Success subfactors	Public Sector		Private Sector		Agreement analysis
	S.I.	R.	S.I.	R.	
Favorable investment environment					
"stable political system"	93.7	1	95.7	1	
"favorable economic system"	92.7	2	89.3	2	
"government support"	90.3	3	79.0	4	
"project is in public interest"	85.5	4	75.7	6	
"predictable risk scenarios"	84.7	5	79.3	5	
"project is well suited for privatization"	82.3	6	82.3	3	rs = 0.91
"adequate local financial market"	80.7	7	68.1	8	
"predictable and reasonable legal framework"	79.0	8	72.0	7	
"supportive and understanding community"	74.3	9	62.0	10	
"predictable currency exchange risk"	71.1	10	66.3	9	
"promising economy"	61.5	11	61.1	11	
Economic viability					
"long-term demand for the products/services"	88.7	1	89.3	1	
"long-term cash flow that is attractive to lender"	87.1	2	86.3	3	
"sufficient profitability of the project to attract investors"	85.5	3	87.5	2	rs = 0.89
"long-term availability of suppliers"	68.7	4	75.7	4	
"limited competition from other projects"	59.0	5	69.0	5	

Table 4 *(continued)*

Success subfactors	Public Sector		Private Sector		Agreement analysis
	S.I.	R.	S.I.	R.	
Reliable concessionaire consortium					
"good relationship with host government authorities"	90.3	1	82.0	2	rs = 0.91
"strong and capable project team"	87.1	3	85.1	1	
"leading role by a key enterprise or entrepreneur"	88.7	2	81.7	3	
"effective project organization structure"	80.7	5	79.3	4	
"sound technical solution"	81.5	4	74.1	7	
"cost-effective technical solution"	78.3	6	75.7	5	
"low environmental impact"	77.5	7	75.1	6	
"public safety and health considerations"	66.3	9	72.0	8	
"multidisciplinary participants"	70.3	8	72.3	9	
"partnering skills"	63.1	11	70.5	11	
"innovative technical solution"	67.1	10	72.3	10	
"rich experience in international PPP project management"	58.3	12	61.7	12	
Sound financial package					
"appropriate toll/tariff level(s) and suitable adjustment formula"	93.5	1	86.3	1	rs = 0.94
"abilities to deal with fluctuations in interest/ exchange rates"	87.0	2	84.7	2	
"sound financial analysis"	82.3	3	84.1	4	
"investment, payment, and drawdown schedules"	80.7	4	79.3	5	
"sources and structure of main loans and standby facilities"	77.5	5	84.7	3	
"long-term debt financing that minimizes refinancing risk"	76.7	6	78.1	6	
"stable currencies of securitization (debts and equity finance)"	73.5	7	75.7	7	
"fixed and low interest rate financing"	70.3	8	73.5	8	
"low financial charges"	61.5	9	71.1	9	
"high equity/debt ratio"	58.3	10	71.1	10	

Table 4 *(continued)*

Success subfactors	Public Sector		Private Sector		Agreement analysis
	S.I.	R.	S.I.	R.	
Appropriate risk allocation					
Appropriate and reliable risk allocation in:					
"concession agreement"	86.3	1	81.7	1	
"off take agreement"	78.3	3	73.5	7	
"guarantees/support/comfort letters"	81.5	2	78.7	3	
"loan agreement"	77.5	4	80.5	2	
"shareholder agreement"	75.0	5	74.7	5	rs = 0.74
"operation agreement"	74.3	7	78.1	4	
"insurance agreement"	75.1	6	74.7	6	
"design and construct contract"	70.3	8	62.0	8	
"supply agreement"	65.5	9	59.3	9	

Note: C.I. = "criticality index", R.= "ranking", r_s = "Spearman's coefficient of rank correlation".

Source: Data collected by the authors.

REFERENCES

1. Terry F. The private finance initiative-overdue reform or policy breakthrough. *Public Money and Management*. 1996;16(1):9–16. URL: https://doi.org/10.1080/09540969609387903
2. Alfen H.W., Kalidindi S.N., Ogunlana S., Wang S., Abednego M.P., Jungbecker A.F., Jan Y.A., Ke Y., Liu Y., Singh B., Zhao G. Public-private partnership in infrastructure development: case studies from Asia and Europe. Verlag der Bauhaus-Universität, Weimar; 2009. 10 p. URL: https://www.econstor.eu/handle/10419/56429
3. Akintoye A., Kumaraswamy M. Public private partnerships, research roadmap. The Netherlands: CIB General Secretariat; 2016. 6–17 p. URL: https://drive.google.com/viewerng/viewer?url=https://www.irbnet.de/daten/iconda/CIB_DC 29669.pdf
4. Wetangula J., Mazurewicz M. The construction market in Kenya. Nairobi: Polish Investment and Trade Agency; 2017.2–18. URL: https://www.coursehero.com/file/92396272/Raport-Sektor-budowlany-w-Kenii-enpdf/
5. Ho S.P. Model for financing renegotiation in public-private partnership projects and its policy implications: game theoretic view. *Journal of Construction Engineering and Management*. 2006;132(7):678–688. DOI: https://doi.org/10.1061/(ASCE)0733–9364(2006)132:7(678)
6. Algarni A.M., Arditi D., Polat G. Build-operate-transfer in infrastructure projects in the United States. *Journal of Construction Engineering and Management*. 2007;33(10):728–735. URL: https://doi.org/10.1061/(ASCE)0733–9364(2007)133:10(728)
7. Zhang X. Critical success factors for public-private partnerships in infrastructure development. *Journal of Construction Engineering and Management*. 2005;131(1):1–18. URL: https://doi.org/10.1061/(ASCE)0733–9364(2005)131:1(3)
8. Chua D.K.H., Kog Y.C., Loh P.K. Critical success factor for different project objectives. *Journal of Construction Engineering and Management*. 1999;125(3):142–165. URL: https://doi.org/10.1061/(ASCE)0733–9364(1999)125:3(142)
9. Marks M., Sparkman J. The new era of public-private partnership in higher education. P3 Edu; 2021. URL: https://www.p3edu.com/wp-content/uploads/2019/03/The-New-Era-of-Public-Private-Partnership-in-Higher-Education.pdf
10. Chiswa N. Unravelling critical success factors in public-private partnership implementation. *European Procurement and Public Private Partnership Law Review*. 2024;19(1):39–60. URL: https://doi.org/10.21552/epppl/2024/1/7
11. Daniel D.R. Management information crisis. *Harvard Business Review*. 1961;(Sept.-Oct.):11–121. URL:

https://scholar.google.com/scholar?&q=DANIEL%2C%20R.%20%281961%29%3A%20Management%20Information%20Crisis.%20Harvard%20Business%20Review%2C%20September%2FOctober%2C%20111%E2%80%93121.

12. Rockart J.F. Chief executives define their own data needs. *Harvard Business Review*. 1979;57(2):81–93. URL: https://hbr.org/1979/03/chief-executives-define-their-own-data-needs
13. Jefferies M., Gameson R., Rowlinson S. Critical success factors of the BOOT procurement system: reflections from the Stadium Australia case study. *Engineering, Construction and Architectural Management*. 2002;9(4):352–361. URL: https://doi.org/10.1108/eb021230
14. Li B., Akintoye A., Edwards P.J., Hardcastle C. Critical success factors for PPP/PFI projects in the UK construction industry. *Construction Management and Economics*. 2005;23(5):459–471. URL: https://doi.org/10.1080/01446190500041537
15. Rockart J. The changing role of the information systems executive: a critical success factors perspective. Working paper (Sloan School of Management). 1982. URL: https://core.ac.uk/reader/4379670
16. Friesen M., Johnson J. The success paradigm: creating organizational effectiveness through quality and strategy. New York: Quorum Books; 1995. 210 p.
17. Tiong R.L.K. CSFs in competitive tendering and negotiation model for BOT projects. *Journal of Construction Engineering and Management*. 1996;122(3):205–211. URL: https://doi.org/10.1061/(ASCE)0733–9364(1996)122:3(205)
18. Qiao L., Wang S.Q., Tiong R.L.K., Chan T. Framework for critical success factors of BOT projects in China. *The Journal of Structured Finance*. 2001;7(1):53–61. URL: https://doi.org/10.3905/jsf.2001.320244
19. Jefferies M. Critical success factors of public private sector partnerships: a case study of the Sydney Super Dome. *Engineering, Construction and Architectural Management*. 2006;13(5):451–462. URL: https://doi.org/10.1108/09699980610690738
20. Zhao Z., Zuo J., Zillante G., Wang X. Critical success factors for BOT electric power projects in China: thermal power versus wind power. *Renewable Energy*. 2010;35(6):1283–1291. URL: https://doi.org/10.1016/j.renene.2009.09.016
21. Almeile A.M., Chipulu M., Ojiako U., Vahidi R., Marshall A. Project-focused literature on public-private partnership (PPP) in developing countries: A critical review. *Production Planning and Control*. 2022;35(7):683–710. URL: https://doi.org/10.1080/09537287.2022.2123408
22. Grimsey D., Lewis M.K. Are public private partnerships value for money: evaluating alternative approaches and comparing academic and practitioner views. *Accounting Forum*. 2005;29(4):345–378. URL: https://doi.org/10.1016/j.accfor.2005.01.001
23. Almeile A.M., Chipulu M., Ojiako U., Vahidi R., Marshall A. The impact of economic and political imperatives on the successful use of public-private partnership (PPP) in projects. *Production Planning and Control*. 2022;35(6):559–579. URL: https://doi.org/10.1080/09537287.2022.2110171
24. Cheung E., Chan A., Lam P., Chan D., Ke Y. A comparative study of critical success factors for public private partnerships (PPP) between Mainland China and the Hong Kong special administrative region. *Facilities*. 2012;30(13/14):647–666. URL: https://doi.org/10.1108/02632771211273132
25. El-Kholy A.M., Akal A.Y. Assessing and allocating the financial viability risk factors in public-private partnership wastewater treatment plant projects. *Engineering, Construction and Architectural Management*. 2021;28(10):3014–3040. URL: https://doi.org/10.1108/ECAM-05–2020–0373

ABOUT THE AUTHORS / ИНФОРМАЦИЯ ОБ АВТОРАХ

Zahed Mannan — Ph.D. in Management and MBA in HR Management. Associate Professor, Bangladesh Open University, Gazipur, Bangladesh

Захед Маннан — доктор философии в области менеджмента и магистр делового администрирования в области управления персоналом, доцент, Открытый университет Бангладеш, Газипур, Бангладеш

https://orcid.org/0000-0003-2597-3055

Corresponding Author

zmannan@bou.ac.bd

Faruq Ahmed — Ph.D. in Business Administration, Professor, Department of Management, University of Dhaka, Bangladesh
Фарук Ахмед — доктор философии в области делового администрирования, профессор факультета менеджмента, Университет Дакки, Дакка, Бангладеш
https://orcid.org/0009-0004-5809-8327
dr.faruqahmed@yahoo.com

Md. Mesbah Uddin — Ph.D. in Business Studies, Professor, Department of Management, University of Dhaka, Bangladesh
Мд. Месбах Уддин — доктор философии в области бизнес-исследований, профессор факультета менеджмента, Университет Дакки, Дакка, Бангладеш
https://orcid.org/0009-0002-3141-5738
mesbah.mgt@du.ac.bd

Authors' declared contribution:
Zahed Mannan — Critical analysis of literature, methodology, results presentation in the form of tables, and data analysis.
Faruq Ahmed — Introduction and findings.
Md. Mesbah Uddin — Survey and data interpretation.

Conflicts of Interest Statement: The authors have no conflicts of interest to declare.

The article was submitted on 14.05.2024; revised on 17.06.2024 and accepted for publication on 19.06.2024. The authors read and approved the final version of the manuscript.

ORIGINAL PAPER

DOI: 10.26794/2308-944X-2024-12-2-42-54
UDC 330.341,336.5.02,338.242.4(045)
JEL F41, H53, P35, P48

Public Expenditure in the Fastest Growing and Emerging Market Economies in Africa: The Role of Institutional Quality

S. Mbulawa
Botswana Accountancy College, Gaborone, Botswana

ABSTRACT

Emerging and fastest-growing markets in Africa are developing their financial environment to attract investors and position themselves as an upcoming generation of strong and influential markets. The **subject** of this study is public expenditure outlays used to stimulate economic activity in emerging markets in Africa. The **purpose** of this study is to isolate the main determinants of government spending and the role of institutional quality. The **relevance** lies in the significance of maintaining such expenditures at optimal levels to benefit the economy. The **scientific novelty** lies in the analysis of the main factors explaining government spending to support policy formulation in emerging markets. This study applied the autoregressive distributed lag (ARDL) model to test both long-term and short-term dynamics. Based on the **results**, the study demonstrated both joint and long-run causality between the selected variables and government expenditure. Short-term causality is not confirmed. The study **concluded** that the Wagner law still holds, in which economic growth is coupled with an increase in expenditure. The Economic freedom index is more effective in controlling government expenditure than the POLITY 2 variable. This study offers some policy implications.

Keywords: public expenditure; emerging markets; institutional quality; Wagner law; autoregressive distributed lag; Africa

For citation: **Mbulawa S. Public expenditure in the fastest growing and emerging market economies in Africa: The role of institutional quality.** ***Review of Business and Economics Studies*****. 2024;12(2):42-54. DOI: 10.26794/2308-944X-2024-12-2-42-54**

ОРИГИНАЛЬНАЯ СТАТЬЯ

Государственные расходы в быстрорастущих странах Африки с развивающимся рынком: роль качества институциональной среды

С. Мбулава
Колледж бухгалтерского учета Ботсваны, Габороне, Ботсвана

АННОТАЦИЯ

Развивающиеся и наиболее быстрорастущие рынки Африки совершенствуют свою финансовую среду в целях привлечения инвесторов и позиционирования себя в качестве сильных и влиятельных рынков нового поколения. **Предметом** данного исследования являются государственные расходы, используемые для стимулирования экономической активности на развивающихся рынках стран Африки. **Цель** данного исследования — выявить основные факторы, определяющие государственные расходы, и роль институционального качества. **Актуальность** заключается в важности поддержания таких расходов на оптимальном уровне, чтобы они приносили пользу экономике. **Научная новизна** — в анализе основных факторов, объясняющих государственные расходы для поддержки разработки политики на развивающихся рынках.

В данном исследовании применялась модель авторегрессии с распределенным лагом (ARDL) для проверки как долгосрочной, так и краткосрочной динамики. Результаты исследования продемонстрировали как совместную, так и долгосрочную причинно-следственную связь между выбранными переменными и государственными расходами. Кратковременная причинно-следственная связь не подтверждена. В исследовании сделан вывод о том, что закон Вагнера, согласно которому экономический рост сопровождается увеличением расходов, по-прежнему действует. Индекс экономической свободы более эффективен для контроля государственных расходов, чем переменная POLITY 2. Данное исследование позволяет сделать некоторые выводы, применимые при разработке политических решений.
Ключевые слова: государственные расходы; развивающиеся рынки; институциональное качество; закон Вагнера; авторегрессия с распределенным лагом; Африка

Для цитирования: **Mbulawa S. Public expenditure in the fastest growing and emerging market economies in Africa: The role of institutional quality.** ***Review of Business and Economics Studies*****. 2024;12(2):42-54. DOI: 10.26794/2308-944X-2024-12-2-42-54**

1. Introduction

This study examines the long-term determinants of government expenditure in emerging and fastest-growing economies, with particular focus on the role of institutional quality. Several countries in Africa are developing their financial markets to attract investors and position themselves as an upcoming generation of emerging markets. They offer investors opportunities for good returns on investments. The nature and sophistication of the stock market, in comparison to the level of economic development, underpin the classification of an economy as emerging [1, 2]. In this study, the term emerging markets refers to countries with financial markets that help to win investors' attention and are experiencing growth led by the private sector [3].[1] Fastest-growing economies in Africa are identified by the African Development bank.[2] In most emerging and fastest growing markets, the size of the government represents the extent to which public institutions are participating in economic development. The government brings about changes in the structure of the economy. In most economies, the government's size and scope have changed. It is desirable for any government to promote the welfare and interests of citizens. This is coupled with engaging programs in different domains, including economic, political, and legal structures. Involvement in such programs increases the size of the government, particularly in Africa, where the private sector does not do much to improve economic outcomes[3] [4].

While it may be plausible that government expenditures should increase to stimulate economic activity, it is also critical that such expenditures are mitigated to bring benefits to the economy. A rise in government spending that outstrips revenues may crowd out private investments. To deal with this, the government may follow an expansionary fiscal policy drive, which may cause the economy to overheat. However, stable government expenditure underpinned by taxation revenues that are proportional to gross domestic product (GDP) may give rise to a balanced budget [5].

Discussions on government expenditure and its drivers are key, as they provide direction to policymakers on making effective decisions in managing fiscal shortafalls and bringing stable economies [6]. It is critical to focus on government expenditure considering that in emerging and growing markets in Africa, there are still elements of poverty and other social ills like high unemployment and crime. Improvements in social indicators do not match the growth in government expenditure. More so, as much as studies have been done focusing on these drivers, there is no consensus on the main determinants in this context. While there is a consensus that factors such as economic growth, trade openness, inflation, population, taxation, and democracy are associated with government expenditure, there is a lack of agreement on their

[1] Africa Business Pages (ABP) (2023). The emerging markets in Africa. URL: https://www.africa-business.com/features/africa-emerging-business.html (accessed on 20.11.2023).

[2] Africa Development Bank (2023). Africa's economic growth to outpace global forecast in 2023–2024 — African Development Bank biannual report. URL: https://www.afdb.org/en/news (accessed 19.11.2023).

[3] Farquharson, E., Yescombe, E. R. (2011). How to engage with the private sector in public-private partnerships in emerging markets. World Bank Publications.

respective contributions [7, 8]. Furthermore, there is a lack of evidence about the role of institutions in explaining government expenditure.

Institutions influence economic activity as they put in place and act as constraints that allow for interaction between political, social, and economic factors. They help streamline human behavior and ensure that there are benefits derived from human interactions and any economic activity. Countries develop faster where there are strong and effective institutions. Scholars have conducted extensive research on the impact of institutions on economic growth and activity [9, 10]. These studies argue that strong and efficient institutions explain country differences with respect to income levels. However, there is still limited work on their effect on government expenditure patterns. There is inconclusive evidence regarding their effect in different political regimes and the extent of economic freedoms provided [11, 12]. There is rent-seeking behavior in economies with autocratic rule as the government allocates more funding to military activities as opposed to other development areas such as education, which improves welfare for all. Effective institutions can help mitigate such behaviors, yet the evidence is not clear in our context.

From a policymaker's point of view, it is critical to understand ways to administer public funding when faced with limited resources and the need to reduce costs of governance. Balancing between money allocated to capital and recurrent expenditures requires that policymakers be informed of the main drivers, as it becomes difficult to develop where such choices are in conflict. Since the effects of these drivers differ based on the context and choice of variables, it is critical that we understand the dynamics in emerging and growing market economies. These have drawn much attention as potential drivers of regional GDP. The main questions are as follows: Which are the main drivers and constraints to a rise in government expenditure? Does institutional quality play an important role in explaining the level of government expenditure?

This paper is organized as follows: section 2 focuses on a literature review to provide evidence from past studies; it is followed by section 3, which focuses on the methodology; section 4 gives the results and discussion; and, finally, the study provides conclusions and policy implications.

2. Literature review

Theories

Several theoretical propositions have been put forward in relation to government or public expenditureы. For example, Wagner's proposition opines that public expenditure is driven by a rise in economic growth. The rise in demand for public services and decisions by the state to increase their administrative capacity lead to an increase in expenditure. Growth would translate to increased public spending [13]. Keynesian theory argues that government intervention in the form of social programs and public-funded projects increases public expenditures. Investing in such programs creates a conducive environment for private sector participation in development [14].

Empirical evidence

It is critical that government expenditures be translated into sustainable economic development. Understanding how resources are distributed and managed helps to gauge potential economic outcomes. This helps in reviewing spending plans and redirecting government efforts towards beneficial areas. In the African context, public funding is the main engine for growth using public programs. It is no simple task to effectively manage public resources. Furthermore, countries differ in terms of governance and development; hence, their needs and priorities differ as well. Public expenditure efficiency increases with high levels of GDP per capita [15]. Evidence [16] supports that there is unidirectional causality from GDP to government expenditure. GDP has a positive effect on government expenditure [7]. On the contrary, [17] shows that there is no link between government expenditures and GDP, suggesting that Wagner's Law does not hold. There is no evidence of causality between the two variables.

An inflow of international aid results in an expansion in government recurrent expenditure [7, 18]. Past studies [19, 20] argue that international aid is fungible for financing recurrent expenditures. It is a key determinant of government expenditure in low- and middle-income economies [21]. It crowds out domestic government spending on public investment [22].

Evidence suggests that the effect of urbanization on expenditure depends on the type of outlay. For example, past studies [17, 23, 24] show that urbanization has a positive effect on health care expenditure. It induces health care expenditures in developing countries [25]. Urbanization leads to an increase in demand for public services [26]. On the contrary, [27] show that urbanization has a nonlinear relationship with government expenditure. It has a negative effect on public sector expenditure due to positive external consequences and economies of scale. The relationship becomes positive after crossing a threshold of 55.28% due to negative externalities.

Studies [7, 17, 28–31] show that taxation has a positive effect on government expenditure. The two variables are cointegrated and have a stable relationship. The long-term and positive impact of taxation exists when we consider capital government expenditure [32]. Causality runs from taxation revenue to government expenditure [33]. On the contrary, unidirectional causality flows from government expenditure to tax revenue [34]. The tax-spend hypothesis was found to exist using data for a group of countries in Latin America. It shows that the government spends first, increasing taxation at a later stage. This means that changes in public expenditure lead to changes in public revenue [35].

Good governance is critical for economic development. Budget allocations fund public programs, which drive growth in emerging and growing market economies. An economic system could be open or closed, and alternatively, a country could be regarded as democratic or autocratic, but the government still has a key role to play in development. Institutional quality has been found to influence the level of government expenditure in past studies. For example, [11] argues that the type of political regime determines what features within government expenditure; government expenditure is low in a country with an inefficient legal system [36]; the quality of institutions determines the efficiency of government expenditure [7, 37]; high-quality institutions facilitate and help to effectively manage public resources [38]; institutions are effective where they limit money wasted and corruption [39]. The effect of institutional quality on expenditures depends on the composition. For example, corruption increases expenditure on defense and public services while reducing expenditure on education, health, and cultural issues [40]. This is supported by [41], which shows that weak institutions result in corrupt practices and high public expenditures.

There are few cross-country studies linking aid and government expenditures [42, 43]. Trade openness has been found to negatively affect government expenditure [17]. This is supported by the author of [18], who shows that trade liberalization has a negative association with the expenditure structure. On the contrary, past studies [44–46] found that trade openness has a positive effect on government expenditure in low-income countries. Trade tax revenue has a positive impact on expenditure in the long run, not the short run [18]. A study [47] argues that the quality of institutions reinforces the causal relationship between openness and government expenditure. [50] find no cointegration relationship between trade openness and government expenditure.

3. Methodology

3.1. Model and estimation

In this section, the study models public expenditure on a vector of variables identified from the literature based on their relevancy. The approach is to use an autoregressive distributed lag (ARDL) model, as supported by past studies [6, 19, 49]. The model was selected based on the assertion that there are a spillover effects from past behaviors of variables. The procedure entails the estimation of an overparameterized model with an arbitrary number of lags for all variables. This may give rise to a model that is consistent with the theory and data employed. An economic procedure was followed to determine the relevance of the model. This involves checking for stationarity or unit root and determining the order of integration. The study employed the methods described in [50] and [51]. Once the order of integration has been determined, the study proceeds to test for cointegration using methods by Westerlund and Kao [52]. After confirming the cointegration of variables, the subsequent step involves choosing the optimal model. A study [53] suggests that if all variables are stationary, then ordinary least squares techniques and vector autoregression

models are applied. If all variables are non-stationary, we apply the Johansen test to assess cointegration. Again, with mixed variables, we test for cointegration, and if present, we employ the ARDL model with possibilities of using error correction models (ECM) and assessing causality. Non-stationary variables are made stationary by taking the first difference. The same can be attained by including a time variable in the regression or by extracting trends and cycles from the single series using the Hodrick-Prescott filter. All these approaches to attaining stationarity may result in losing the long-run information of the variables. However, it's possible to derive an ECM from ARDL by linear transformation. The ECM integrates both short- and long-run dynamics and avoids losing long run information. The ARDL captures both short- and long-run relationships among cointegrated variables. As suggested by [54], the study applies the pooled mean group (PMG) method, which allows for short run coefficients to vary across countries while maintaining the same long run coefficients. It is applicable even with small periods and cross sections in panels. The specific model is as follows:

where α is a constant and β are parameters

$$GEP_{it} = \alpha_i + \sum_{j=1}^{P}\beta_0 GEP_{i(t-j)} + \sum_{j=0}^{q}\beta_1 GDPPC_{i(t-j)} \sum_{j=0}^{q}\beta_2 TO_{i(t-j)} + \\ + \sum_{j=1}^{P}\beta_3 POLITY2_{i(t-j)} + \sum_{j=0}^{q}\beta_4 EFI_{i(t-j)} + \sum_{j=0}^{q}\beta_5 ODA_{i(t-j)} + \\ + \sum_{j=1}^{P}\beta_6 UBN_{i(t-j)} + \sum_{j=1}^{P}\beta_6 TE_{i(t-j)} + \mu_{it} \quad (1)$$

to be estimated; i and t represent country and time components. Through re-parameterization of equation (1) the error correction term (ECT) is obtained as follows:

$$\Delta GEP_{it} = \alpha_i + \vartheta_i \left(\begin{array}{l} GEP_{i,(t-j)} - \omega_1 GDPPC_{i(t-j)} - \omega_2 TO_{i(t-j)} - \\ - \omega_3 POLITY2_{i(t-j)} - \omega_4 EFI_{i(t-j)} - \omega_5 ODA_{i(t-j)} \\ - \omega_6 UBN_{i(t-j)} - \omega_7 TE_{i(t-j)} \sum_{j=1}^{P-1}\theta_1 \Delta GEP_{i(t-j)} + \sum_{j=0}^{q-1}\theta_2 \Delta GDPPC_{i(t-j)} + \\ + \sum_{j=0}^{q-1}\theta_3 \Delta TO_{i(t-j)} + \sum_{j=0}^{q-1}\theta_4 \Delta POLITY2_{i(t-j)} + \sum_{j=0}^{q-1}\theta_5 \Delta EFI_{i(t-j)} + \\ + \sum_{j=0}^{q-1}\theta_6 \Delta ODA_{i(t-j)} + \sum_{j=0}^{q-1}\theta_7 \Delta UBN_{i(t-j)} + \sum_{j=0}^{q-1}\theta_8 \Delta TE_{i(t-j)} + \mu_{it} \end{array} \right) \quad (2)$$

The short- and long-run coefficients, respectively, are θ and ω, and the speed of adjustment is ϑ.

3.2. Data and variables

The study uses annual data from various sources for the period 1990–2020. The analysis focuses on 19 emerging and fast-growing African economies. The dependent variable is government expenditure (GEP), obtained from the International Monetary Fund database. This is the real government expenditure as a share of GDP [19]. The main explanatory variables are tax effort (TE), which is defined as tax revenue as a share of GDP [55]. The data set on true random scores is obtained from the United Nations University World Institute for Development Economics Research. Net ODA received (% of GNI) is employed to capture net aid from official donors (ODA). Institutional quality is captured using the economic freedom index (EFI). Data is collected from the Fraser Institute and is an annual measure that captures efforts to create a stable macroeconomic environment and ensure that contracts are enforceable [56]. In addition, the POLITY 2 score captures a country's democratic institutions on a scale from one to ten. Control variables, as defined by the World Bank, are gross domestic product per capita (GDPPC) in current United States dollars (US$) which is defined as the GDP divided by the mid-year population; trade openness (TO), which is the average imports and exports as a percentage of GDP; Population in the largest city (% of the urban population) is used as a proxy for urbanization (UBN).

4. Results and discussion

Table 1 provides summary statistics for variables as follows: the average government expendi-

Table 1
Descriptives

stats	GEP	GDPPC	TO	POLITY 2	EFI	ODA	UBN	TE
mean	20.40	2087.13	30.81	2.61	5.77	7.29	30.02	26.61
sd	7.07	2376.93	13.93	5.28	1.09	8.83	14.23	7.45
skewness	1.12	1.66	13.93	5.28	1.09	8.83	14.23	7.45
kurtosis	4.12	5.10	3.01	1.71	2.58	25.57	2.40	3.39
N	608	590	608	596	596	565	587	542

Source: Developed by the author.

ture is 20.40%, the average GDP per capita is USD 2087.13, which shows that most of the sampled countries are in the lower middle-income bracket as defined by the World Bank in 2022. The level of trade openness is around 30% of GDP on average. The POLITY 2 score is 2.61 on average, which shows that countries have weak democratic institutions; the EFI score is 5.77 on average, which shows that most countries have moderate economic freedom. The net aid received from official donors is low, at around 7% of GDP on average. The extent of urbanization is still low, with the population in the largest cities being a third of the urban population. On average, revenue is below a third of GDP, demonstrating the critical role that revenue collection agencies must play in these countries.

In *Table 2*, we present results for checking potential multicollinearity among variables. The coefficients for any pair of explanatory variables are less than 0.50, are positive, negative and significant. This demonstrates that multicollinearity is not a significant issue, and we can apply our variables within the same model. Strong correlations exist between government expenditure and all variables.

In *Table 3*, we present findings that show that all variables are stationary after first differencing, except for ODA and TE. Thus, there is potential for co-integration among variables.

The study employed Kao's method to test for cointegration. *Table 4* shows that the hypothesis of no cointegration is rejected using all five statistics. Therefore, one can conduct analysis using either the ARDL or ECM models.

Empirical models are estimated using the ARDL technique as follows: Model (1) with all the variables to examine their contribution to government expenditure. This is followed by estimating models (2), which incorporate

Table 2
Correlation

	GEP	GDPPC	TO	POLITY 2	EFI	ODA	UBN	TE
GEP	1.000							
GDPPC	0.536**	1.000						
TO	0.156**	0.465**	1.000					
POLITY 2	0.167**	0.124**	0.305**	1.000				
EFI	0.129**	0.155**	0.316**	0.497**	1.000			
ODA	-0.344**	-0.046	-0.300**	-0.343**	-0.202**	1.000		
POP	-0.143**	-0.092**	0.193**	-0.332**	-0.119**	0.121**	1.000	
TE	0.088**	0.002	0.032	0.134**	0.045	-0.062	-0.062	1.000

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

Source: Developed by the author.

Table 3
Unit root

Variable	IPS		FISCHER		Order
	Levels	First Difference	Levels	First Difference	
GEP	−1.2453	−6.0487***	1.3673	−22.3086***	I(1)
GDPPC	−0.3818	−4.6222***	5.3652	−15.8648***	I(1)
TO	−0.4504	−3.0933***	4.6821	−7.9772***	I(1)
POLITY 2	−1.5436	−3.654***	−3.6687***	−13.5583***	I(1)
EFI	−1.6340	−4.4094***	−0.4384	−11.6245***	I(1)
ODA	−2.5334***	−7.1881***	−5.3158***	−26.6101***	I(0)
UBN	−0.9303	−2.2699***	−0.0382	−3.7826***	I(1)
TE	−2.3263***	−5.7803***	−4.2108***	−21.1573***	I(0)

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

Source: Developed by the author.

institutional quality variables one at a time. It allows us to appreciate the changes in results and potentially isolate the effect of each measure. Model (4) is the final estimation that incorporates all variables. This proves to be the best model for predicting government expenditure among emerging and fast-growing economies. Findings (*Table 5*) show that government expenditure returns to equilibrium after changes in its covariates at a speed of 45% on average, as shown by all models. It is the speed at which the model corrects itself when there are deviations in the short run. In the short run, none of the explanatory variables is significant, in all models, except institutional quality variables. Though significant at the 10% level, the POLITY 2 variable has a negative effect on government expenditure in model (4). The economic freedom index is negative and significant at the 5% level in models (3) and (4). This shows that, in the short run, strengthening institutional quality helps to control excessive government expenditure. All variables are significant using the long-run model.

The impact of GDP per capita on government expenditure remains positive in all four models. This is demonstrated by the coefficients, which are significant at the 1% level. In other words, as economic welfare improves coupled with a rise in GDP, the level of government expenditure increases in the long term. This is consistent with Wagner's law, which argues that public expenditure increases as national income rises. The value of our coefficients shows that there are marginal changes in public expenditure of about 0.02% for every 10% change in GDP per capita. Findings are consistent with past studies [19, 57, 58], which show that significant changes in national economic welfare have a positive contribution to public spending. This is linked to the emerging demand for public goods as the government seeks to meet the needs of citizens and develop initiatives.

Taxation revenue has a positive and significant effect on government expenditure in the long run. This is demonstrated by coefficients that are significant at the 1% level throughout. A 10% rise in tax revenue would induce a growth in public spending of 1.94%, using model (1). The size of the coefficient increases slightly with the introduction of the POLITY 2 variable and falls in models (3) and (4) with the introduction of the economic freedom index variable. This shows the importance of the choice of institutional variables in modeling the effect of taxation revenue. Findings are consistent with past studies [59, 60] that support the tax-spend hypothesis by Friedman in 1978. Thus, the government's potential to improve spending is enhanced by a rise in tax efforts. This has implications for effective monitoring where countries have unpredict-

Table 4
Tests for cointegration

Kato Test for cointegration		
H0: No cointegration **Ha: All panels are cointegrated**		
Cointegrated Vector: Same Panel means: Included Time trend: Not Included AR parameter: Same	Kernel: Lags: Augmented Lags:	Bartlett 1.79 (Newey-West) 1
Modified Dickey Fuller t	−3.4767	0.0003
Dickey Fuller t	−3.1928	0.0007
Augmented Dickey-Fuller t	−1.8275	0.0338
Unadjusted Modified Dickey-Fuller t	−6.7683	0.0000
Unadjusted Dickey-Fuller t	−4.4821	0.0000

Source: Developed by the author.

able revenue flows and appetite for spending. The consequences are adverse, as rising spending would entail seeking help from taxpayers in the future to avert a budget deficit.

The study shows that development aid has no effect in the long term when considering models (1) and (2). The introduction of economic freedom index in models (3) and (4) results in a positive and significant coefficient. It rises with both measures of institutional quality in the model. This shows the significance of strong institutions in curbing spending that may rise with the receipt of aid. The contribution of aid to spending is supported by past studies [42, 61]. Though it may come with high dependency and administrative costs, aid increases the incentive to spend as a cheaper source of funding. The effect differs on whether we consider capital or recurrent spending.

Trade openness has a negative and significant effect on government expenditure, considering models (1) to (3). This means that as countries become more open to international trade, less is spent by the government. This is consistent with [62], who argues that an increase in trade flows may mean a fall in revenues, which may ultimately lead to a reduction in spending. On the other hand, when we incorporate both measures of institutional quality into the model, we find that the effect of trade openness becomes positive. This could be explained by the countries that are faced with outside shocks as trade flows increase. This may be coupled with high spending as governments endeavor to give access to more goods and services while reducing the impact of global shocks. As countries open their economies, local demand rises, which should be met by a rise in spending, as supported by past studies [59, 45].

This study's findings differ from several previous studies on our proxy for urbanization. In general, as the urban population rises, the expectation is that more government expenditures will occur. In our study, the effect is negative in all our models, which is similar to [63], who found the same sign in the context of South American countries. They found that urbanization reduces government spending.

Findings on institutional quality have been linked to other covariates earlier in the discussion. The POLITY 2 variable is insignificant throughout the two models estimated. The variables measuring the economic freedom index are significant in all two models. Both variables have proven to be important in modeling government expenditure. The negative impact of EFI variables suggests that it is crucial in bringing restraint to spending, as supported by empirical evidence. [63] shows that institutional quality has a negative effect on public spending. As institutions improve, they mitigate the level of public spending. The effect is linked to the way in which public spending is distributed. Past studies [12, 64, 65] argue that the allocation of expenditure depends on whether the government autocratic or democratic. The former allo-

Table 5
Empirical models

Long run models				
Models	**1**	**2**	**3**	**4**
GDPPC	0.002***	0.002***	0.003***	0.002***
TE	0.194***	0.196***	0.135***	0.136***
ODA	0.06	0.056	0.102***	0.114***
TO	−0.061***	−0.066**	−0.050**	0.038**
UBN	−0.457***	−0.445***	−0.362***	−0.397***
POLITY 2		0.012		0.038
EFI			−0.768***	−0.988***
Short run models				
ECT	−0.447***	−0.441***	−0.436***	−0.450***
GDPPC	−0.001	−0.001	−0.001	−0.001
TE	−0.021	−0.017	−0.001	0.013
ODA	−0.138	−0.053	−0.108	−0.086
TO	−0.042	−0.05	−0.029	−0.04
UBN	−0.485	−1.174	0.812	−1.64
POLITY 2		−0.236		−0.279*
EFI			−1.553***	−1.326***
C	12.032***	11.803***	11.684***	13.217***

*Significant at 10%, **significant at 5% and ***significant at 1%.

Source: Developed by the author.

cates more to military spending and less to education. In this study, countries are democratic on average which suggests that there is balanced spending on different forms of expenditure. There is an aspect of carrying out activities that allow for the extraction of rents while growing economies at a slow pace. However, strengthening institutions would lower the need to monitor the efficiency of public spending.

5. Conclusions and policy implications

This study sought to isolate the main determinants of government spending and the role of institutional quality in emerging and fast-growing economies in Africa. It employs data from 1990 to 2020 for 19 countries. While the study is more inclined toward the Wagner law, it included other variables that capture the current context. This study applied an autoregressive distributed lag model to test both long-term and short-term dynamics. This study demonstrated that there is joint causality and long-run causality between the selected variables and government expenditure. Short-term causality is not confirmed.

This study has demonstrated that the Wagner law still holds, and economic growth is coupled with rising expenditures. This means that as the government invests more in expanding the economy's potential, more will be spent. The more governments are involved in public projects to boost national income, the more money is spent. The availability of tax revenues increases the appetite for government spending, which confirms the tax-spend hypothesis. This indicates the importance of decisions that restrain the use of public funds; otherwise, huge deficits are imminent. This study demonstrated that official development aid creates a buffer on which the government can draw additional spending resources.

This complements the available local resources from tax revenues. This study demonstrated that more is spent when an economy is susceptible to global events through increased trade flows. Much uncertainty is experienced when countries are open, and spending more public funds would mitigate that. This study demonstrated that selecting the correct institutional variable is key. It appears that the economic freedom index is more effective than the POLITY 2 variable in controlling government expenditure.

This study suggests that affording citizens more economic freedom, such as strengthening the legal system, having sound money, increasing regulation, and having the freedom to trade, would help optimize government spending. It is critical that countries strengthen property rights and bring stability to the macroeconomy. Otherwise, by strengthening democratic institutions, countries may help improve monitoring government expenditure patterns and bring more accountability to public officials.

REFERENCES

1. Marquis C., Raynard M. Institutional strategies in emerging markets. *Academy of Management Annals*. 2015;9(1):291–335. URL: http://dx.doi.org/10.5465/19416520.2015.1014661
2. Kehl J.R. Emerging markets in Africa. *African Journal of Political Science and International Relations*. 2007;1(1):1–8.
3. Nellor D.C. The rise of Africa's "frontier" markets. *Finance and Development.* 2008;45(3):30–33.
4. Eberhard A. The political economy of power sector reform in South Africa. *The Political Economy of Power Sector Reform*. 2007:215–53. URL: http://dx.doi.org/10.1017/CBO9780511493287.007
5. Fatás A., Mihov I. Fiscal policy as a stabilization tool. *The BE Journal of Macroeconomics*. 2012;12(3):61–66. URL: http://dx.doi.org/10.1515/1935–1690.113
6. Aladejare S.A. Testing the robustness of public spending determinants on public spending decisions in Nigeria. *International Economic Journal.* 2019;33(1):65–87. URL: http://dx.doi.org/10.1080/10168737.2019.1570302
7. Obeng S.K., Sakyi D. Explaining the growth of government spending in Ghana. *The Journal of Developing Areas.* 2017;51(1):103–28. URL: http://dx.doi.org/10.1353/jda.2017.0006
8. Ofori-Abebrese G.A. Co-integration analysis of growth in government consumption expenditure in Ghana. *Journal of African Development*. 2012;14(1):47–62. URL: http://dx.doi.org/10.5325/jafrideve.14.1.0047
9. Aghion P., Howitt P. Capital, innovation, and growth accounting. Oxford *Review of Economic Policy*. 2007;23(1):79–93. URL: http://dx.doi.org/10.1093/oxrep/grm007
10. Acemoglu D., Robinson J.A. The role of institutions in growth and development. *Review of Economics and Institutions*. 2010;1(2):1–33. URL: http://dx.doi.org/10.5202/rei.v1i2.14
11. Persson T., Roland G., Tabellini G. Comparative politics and public finance. *Journal of political Economy.* 2000;108(6):1121–61. URL: http://dx.doi.org/10.2139/ssrn.82669
12. Dizaji S.F., Farzanegan M.R., Naghavi A. Political institutions and government spending behavior: theory and evidence from Iran. *International Tax and Public Finance.* 2016;23:522–549. URL: http://dx.doi.org/10.1007/s10797–015–9378–8
13. Dilrukshini W.A. Public expenditure and economic growth in Sri Lanka: Cointegration analysis and causality testing. *Staff Studies.* 2009;34(1):51–68. URL: http://dx.doi.org/10.4038/ss.v34i1.1239
14. Palley T.I. Keynesian, classical and new Keynesian approaches to fiscal policy: Comparison and critique. *Review of Political Economy.* 2013;25(2):179–204.
15. Moreno-Enguix M.D., Lorente Bayona L.V. Factors affecting public expenditure efficiency in developed countries. *Politics and Policy.* 2017;45(1):105–43. URL: https://doi.org/10.1111/polp.12194
16. Menyah K., Wolde-Rufael Y. Government expenditure and economic growth: The Ethiopian experience, 1950–2007. *The Journal of Developing Areas.* 2013;1:263–280. URL: http://dx.doi.org/10.1353/jda.2013.0015
17. Huang C.J. Government expenditures in China and Taiwan: do they follow Wagner's law? *Journal of Economic Development*. 2006;31(2):139–148.
18. Aregbeyen O.O, Akpan UF. Long-term determinants of government expenditure: A disaggregated analysis for Nigeria. *Journal of Studies in Social Sciences*. 2013;5(1):31–87.
19. Ahmad K., Ali A., Yang M. The effect of trade liberalization on expenditure structure of Pakistan. *Bulletin of Business and Economics (BBE).* 2022;11(1):73–84.

20. Shahzad A., Ahmed T., Khiliji B.A., Ahmed I. Impact of foreign aid on public expenditure in Pakistan. *Researchers World.* 2011;2(3):98–106.
21. Njeru J. The impact of foreign aid on public expenditure: The case of Kenya. *Africa Economic Research Consortium.* 2003;35:1–29.
22. Remmer K.L. Does foreign aid promote the expansion of government? *American Journal of Political Science*. 2004;48(1):77–92. URL: http://dx.doi.org/10.1111/j.0092–5853.2004.00057.x
23. Chatterjee S., Giuliano P., Kaya I. Where has all the money gone? Foreign aid and the composition of government spending. *The BE Journal of Macroeconomics*. 2012;12(1):21–28. URL: http://dx.doi.org/10.1515/1935–1690.2458
24. Shao, Q., Tao, R., Luca, M.M. The effect of urbanization on health care expenditure: evidence from China. *Frontiers in public health.* 2022;10, 850872. URL: http://dx.doi.org/10.3389/fpubh.2022.850872
25. Boz C., Taş N., Önder E. The impacts of aging, income and urbanization on health expenditures: A panel regression analysis for OECD countries. *Turkish Journal of Public Health*. 2020;18(1):1–9. URL: http://dx.doi.org/10.20518/tjph.426494
26. Çetin M.A., Bakırtaş İ. Does urbanization induce health expenditures? A dynamic macro-panel analysis for developing countries. *Dumlupınar University Journal of Social Sciences*. 2019;(61):208–222.
27. Elheddad M., Djellouli N., Tiwari A.K., Hammoudeh S. The relationship between energy consumption and fiscal decentralization and the importance of urbanization: Evidence from Chinese provinces. *Journal of Environmental Management*. 2020;264:110474. URL: http://dx.doi.org/10.1016/j.jenvman.2020.110474
28. Golkhandan A., Alizadeh M. Non-Linear Effect of Urbanization on Public Sector Expenditure: STR Model Approach. *Urban Economics.* 2018;3(1):43–58.
29. Ologbenla P. The effect of corporate tax on government expenditure in Nigeria. *Research Horizon*. 2021;1(5):157–71. URL: http://dx.doi.org/10.54518/rh.1.5.2021.157–171
30. Adegbite T.A., Agboola O.O. Analysis of the Impact of Taxation on Public Expenditure in Nigeria. *LASU Journal of Management Sciences (LASUJMS)*. 2019:21–56.
31. Kithinji A.M. The Effect of Taxation on Government Expenditure in Kenya. *International Journal of Business Management and Economic Research*. 2019;10(5):1679–1686.
32. Adejare A.D., Akande S.S. The Impact of personal income tax on government expenditure in Oyo State. *Journal of Account and Financial Management.* 2017;*2*(4):635–643. DOI: http://dx.doi.org/10.18535/afmj/v2i4.02
33. Olaniyi A.T., Mustapha N.A., Oyedokun E.G. Impact of taxation on government capital expenditure in Nigeria. *Journal of Management and Social Sciences.* 2019;8(2):674–687.
34. Mohanty A.R., Mishra B.R. Cointegration between government expenditure and revenue: Evidence from India. *Advances in Economics and Business.* 2017;5(1):33–40.
35. Aisha Z., Khatoon S. Government expenditure and tax revenue, causality and cointegration: The experience of Pakistan (1972–2007). *The Pakistan Development Review*. 2009;48(4):951–959.
36. Narayan P.K., Narayan S. Government revenue and government expenditure nexus: evidence from developing countries. *Applied Economics*. 2006;38(3):285–291. URL: http://dx.doi.org/10.1080/00036840500369209
37. Ramesh R., Vinayagathasan T. The Impact of Corruption, Rule of Law, Accountability, and Government Expenditure on Government Effectiveness: Evidence from Sri Lanka. *Journal of Asian and African Studies.* 2023; 00219096221146999. URL: http://dx.doi.org/10.1177/00219096221146999
38. Albassam B.A. Model for assessing the efficiency of government expenditure. *Cogent Economics and Finance.* 2020;8(1):1823065. URL: http://dx.doi.org/10.1080/23322039.2020.1823065
39. Mandl U., Dierx A., Ilzkovitz F. The effectiveness and efficiency of public spending (No. 301). Directorate General Economic and Financial Affairs (DG ECFIN), European Commission. 2008.
40. Mirzoev T.N. et al. The future of oil and fiscal sustainability in the GCC region (No. 20/01). International Monetary Fund. 2020.
41. Jajkowicz O., Drobiszová A. The effect of corruption on government expenditure allocation in OECD countries. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*. 2015;63(4):1251–1259. URL: http://dx.doi.org/10.11118/actaun201563041251
42. Nan S. Study on the relation of grassroots corruption and government expenditure. *Procedia Computer Science*. 2022;199:1031–1035. URL: http://dx.doi.org/10.1016/j.procs.2022.01.130

43. Kaya I., Kaya O. Foreign aid, institutional quality and government fiscal behavior in emerging economies: An empirical investigation. *The Quarterly Review of Economics and Finance.* 2020;76:59–67. URL: http://dx.doi.org/10.1016/j.qref.2019.08.004
44. Marć L. The impact of aid on total government. *Review of Development Economics.* 2017;21(3):627–663.
45. Gachunga M.J. Modelling the determinants of government expenditure in Kenya. *International Journal of Scientific and Management Research.* 2019;2(5):1–13.
46. Benarroch M., Pandey M. The relationship between trade openness and government size: Does disaggregating government expenditure matter? *Journal of Macroeconomics*. 2012;34(1):239–252. URL: http://dx.doi.org/10.1016/j.jmacro.2011.11.002
47. Kueh J.S.H., Puah C.H., Wong C.M. Bounds estimation for trade openness and government expenditure nexus of ASEAN-4 countries. *Economics, Management and Financial Markets.* 2009; 4(1):103–112.
48. Sáenz E., Sabaté M., Gadea M.D. Trade openness and public expenditure. The Spanish case, 1960–2000. Public choice. 2013;154:173–195. URL: http://dx.doi.org/10.1007/s11127–011–9841–8
49. Oyeleke O., Akinlo T. Trade Openness and Government Expenditure Nexus in Nigeria: A Bounds Test Cointegration Approach. *British Journal of Economics, Management and Trade*. 2016;12(2):1–10. URL: http://dx.doi.org/10.9734/BJEMT/2016/20202
50. Bashir A., Amir A. Relationship between government expenditure on education and GDP per capita in Pakistan: An ARDL Approach to Co-integration. *Advances and Applications in Statistics.* 2019;55(1):77–103. URL: http://dx.doi.org/10.17654/AS 055010077
51. Im K.S., Pesaran M.H., Shin Y. Testing for unit roots in heterogeneous panels. *Journal of Econometrics*. 2003;115(1):53–74. URL: http://dx.doi.org/10.1016/S 0304–4076(03)00092–7
52. Maddala G.S., Wu S.A comparative study of unit root tests with panel data and a new simple test. *Oxford Bulletin of Economics and statistics*. 1999;61(S 1):631–652. URL: http://dx.doi.org/10.1111/1468–0084.0610s1631
53. Gengenbach C., Palm F.C., Urbain J.P. Cointegration testing in panels with common factors. *Oxford Bulletin of Economics and Statistics.* 2006;68:683–719. URL: http://dx.doi.org/10.1111/j.1468–0084.2006.00452.x
54. Shrestha M.B., Bhatta G.R. Selecting appropriate methodological framework for time series data analysis. *The Journal of Finance and Data Science.* 2018;4(2):71–89. URL: http://dx.doi.org/10.1016/j.jfds.2017.11.001
55. Pesaran M.H., Shin Y., Smith R.P. Pooled mean group estimation of dynamic heterogeneous panels. *Journal of the American statistical Association*. 1999;94(446):621–634. URL: http://dx.doi.org/10.1080/01621459.1999.10474156
56. Bird R.M., Martinez-Vazquez J., Torgler B. Tax effort in developing countries and high-income countries: The impact of corruption, voice and accountability. *Economic Analysis and Policy*. 2008;38(1):55–71. URL: http://dx.doi.org/10.1016/S 0313–5926(08)50006–3
57. Gwartney J. et al. Economic freedom of the world: 2022 annual report. *Fraser Institute*. 2022.
58. Jalles J. Wagner's law and governments' functions: Granularity matters. *Journal of Economic Studies*. 2019;46(2):446–466. DOI: 10.1108/JES-02–2018–0049
59. Sagdic E.N., Sasmaz M.U., Tuncer G. Wagner versus Keynes: Empirical evidence from Turkey's provinces. *Panoeconomicus*, 2019;1–18. DOI: 10.2298/PAN 170531001S 60.
60. Jibir A., Aluthge C. Modelling the determinants of government expenditure in Nigeria. *Cogent Economics and Finance.* 2019;7(1):1620154. URL: http://dx.doi.org/10.1080/23322039.2019.1620154
61. Mutascu M. Government revenues and expenditures in the East European economies: A bootstrap panel granger causality approach. *Eastern European Economics.* 2016;54(6):489–502. DOI: 10.1080/00128775.2016.1204237
62. Aworinde B., Onakoya A. Foreign aid and government expansion: Evidence from low- and middle-income countries. *The Journal of Developing Areas.* 2016;50(3):21–33. URL: http://dx.doi.org/10.1353/jda.2016.0102
63. Barra C., Ruggiero N. Institutional quality and public spending in Europe: A quantile regression approach. *Economics and* Politics. 2023;35(3):949–1019. URL: http://dx.doi.org/10.1111/ecpo.12248
64. Jetter M., Parmeter C.F. Does urbanization mean bigger governments? *The Scandinavian Journal of Economics.* 2018;120(4):1202–1228. URL: http://dx.doi.org/10.1111/sjoe.12256
65. Afonso A., Schuknecht L., Tanzi V. Income distribution determinants and public spending efficiency. *The Journal of Economic Inequality.* 2010;8:367–389. URL: http://dx.doi.org/10.1007/s10888–010–9138-z

ABOUT THE AUTHOR / ИНФОРМАЦИЯ ОБ АВТОРЕ

Strike Mbulawa — Ph.D. in Economics, Senior Lecturer, School of Post Graduate Studies, Botswana Accountancy College, Gaborone, Botswana
Страйк Мбулава — Ph.D. (экон.), старший преподаватель, Школа последипломного образования, Колледж бухгалтерского учета Ботсваны, Габороне, Ботсвана
https://orcid.org/0000-0003-1324-631X
smint50000@gmail.com

Conflicts of Interest Statement: The author has no conflicts of interest to declare.

The article was submitted on 16.05.2024; revised on 16.06.2024 and accepted for publication on 19.06.2024. The author read and approved the final version of the manuscript.

ORIGINAL PAPER

DOI: 10.26794/2308-944X-2024-12-2-55-73
UDC 33.025,338.1(045)
JEL O13, F14, F23, Q56, Q57, L83

Exploring the Potential of the Blue Economy: A Systematic Review of Strategies for Enhancing International Business in Bangladesh in the context of Indo-Pacific Region

T. Khan, Md M.H. Emon
Bangladesh University of Professionals, Dhaka, Bangladesh

ABSTRACT

This systematic review **aims** to provide a methodical analysis of the Blue Economy in the Indo-Pacific region, particularly from the perspective of Bangladesh, focusing on its growth trajectory, key stakeholders, policy frameworks, technological advancements, trade and investment trends, as well as challenges and opportunities for international business expansion. The **methods** employed a comprehensive search of electronic databases, and inclusion and exclusion criteria were applied to identify relevant studies for analysis. The **results** revealed that from 2000 to 2020, the Blue Economy sectors of the country, such as fisheries, aquaculture, maritime transportation, and tourism, saw notable development. International development agencies, corporations, academic institutions, governments, and civil society organizations are some of the major players in Blue Economy projects. The policy frameworks that facilitate the development of the Blue Economy include integrated ocean management, blue growth initiatives, maritime security and governance, and resilience and adaptation to climate change. Innovation and expansion in the Blue Economy sectors have been fueled by technological breakthroughs, such as autonomous underwater vehicles, renewable energy projects, remote sensing technologies, and marine biotechnology. Rising demand for sustainable goods and services, technical advancement, and regional collaboration have all contributed to an increase in trade and investment in Blue Economy industries internationally. The **study concludes** that there is significant potential for the Blue Economy in the Indo-Pacific region to drive economic growth, promote social progress, and ensure environmental sustainability. However, challenges such as regulatory complexity, access to finance, inadequate infrastructure, and environmental degradation need to be addressed to fully realize this potential. Addressing these challenges requires coordinated efforts from governments, businesses, academia, civil society organizations, and international development agencies, along with a focus on sustainable and inclusive development practices.

Keywords: Blue Economy; ocean economy; Indo-Pacific region; Bangladesh; growth trajectory; sustainable development goals; technological advancements; trade trends; investment trends; international business; environmental management

For citation: **Khan T., Emon Md M.H. Exploring the potential of the Blue Economy: A systematic review of strategies for enhancing international business in Bangladesh in the context of Indo-Pacific Region. *Review of Business and Economics Studies*. 2024;12(2):55-73. DOI: 10.26794/2308-944X-2024-12-2-55-73**

ОРИГИНАЛЬНАЯ СТАТЬЯ

Изучение потенциала голубой экономики: систематический обзор стратегий развития международного бизнеса в Бангладеш в контексте Индо-Тихоокеанского региона

Т. Хан, Мд М.Х. Эмон
Бангладешский университет профессионалов, Дакка, Бангладеш

АННОТАЦИЯ

Целью данного систематического обзора является глубокий анализ голубой (синей) экономики в Индо-Тихоокеанском регионе, в частности, в Бангладеш. Особое внимание уделяется траектории роста голубой экономики, ключевым заинтересованным сторонам, политическим концепциям, технологическим достижениям, тенденциям в торговле и инвестициях, а также вызовам и возможностям для расширения международного бизнеса. **Методы** исследования включали комплексный поиск в электронных базах данных с применением критериев включения и исключения для выявления релевантных научных публикаций для анализа. **Результаты** показали, что с 2000 по 2020 г. в секторах голубой экономики страны, таких как рыболовство, аквакультура, морской транспорт и туризм, наблюдалось заметное развитие. Международные агентства развития, корпорации, академические институты, правительства и организации гражданского общества являются одними из основных участников в проектах голубой экономики. Политические концепции и инструменты, способствующие развитию голубой экономики, включают комплексное управление океаном, инициативы «голубого роста», морскую безопасность и управление, а также устойчивость и адаптацию к изменению климата. Инновациям и развитию в секторах голубой экономики способствовали технологические прорывы, такие как автономные подводные аппараты, проекты возобновляемых источников энергии, технологии дистанционного зондирования и морские биотехнологии. Растущий спрос на экологически чистые товары и услуги, технический прогресс и региональное сотрудничество — все это способствовало увеличению торговли и инвестиций в отрасли голубой экономики на международном уровне. В исследовании делается **вывод** о значительном потенциале голубой экономики в Индо-Тихоокеанском регионе для стимулирования экономического роста, содействия социальному прогрессу и обеспечения экологической устойчивости. Однако для полной реализации этого потенциала необходимо решить такие проблемы, как сложность регулирования, доступ к финансам, неадекватная инфраструктура и деградация окружающей среды. Решение этих проблем требует скоординированных усилий со стороны правительств, бизнеса, научных кругов, организаций гражданского общества и международных агентств развития, а также сосредоточения внимания на практиках устойчивого и инклюзивного развития.

Ключевые слова: голубая экономика; экономика океана; Индо-Тихоокеанский регион; Бангладеш; траектория роста; цели устойчивого развития; технологические достижения; торговые тенденции; инвестиционные тенденции; международный бизнес; природопользование

Для цитирования: **Khan T., Emon Md M.H. Exploring the potential of the Blue Economy: A systematic review of strategies for enhancing international business in Bangladesh in the context of Indo-Pacific Region.** ***Review of Business and Economics Studies*****. 2024;12(2):55-73. DOI: 10.26794/2308-944X-2024-12-2-55-73**

1. Introduction

The 21st century has witnessed a paradigm shift in global economic discourse, with increasing recognition of the pivotal role oceans play in sustainable development. The Blue Economy (BE) is a paradigm that aims to use marine resources to promote economic development while also prioritizing environmental sustainability and social equality [1–3]. Amidst changing geopolitical dynamics and environmental difficulties, governments are exploring different methods to achieve economic success. The Indo-Pacific Region has become one of the key areas for the development of BE projects [4–6]. The BE idea spans a wide range of economic sectors and activities, including fisheries, aquaculture, renewable energy, marine biotechnology, and coastal tourism [7, 8]. The focus is on promoting the responsible and long-term use of ocean resources, implementing management strategies that take into account the whole

ecosystem, and incorporating environmental factors into economic planning and decision-making. The BE fundamentally signifies a shift away from conventional methods of using resources towards a comprehensive and all-encompassing strategy that emphasizes long-term sustainability and resilience [9].

Although the Indo-Pacific region is a significant area for the growth of the BE, it is important to acknowledge that Europe, North America, and Latin America also have important opportunities in this field. Based on the Organisation for Economic Cooperation and Development (OECD) data, these regions are significant contributors to the advancement of BE initiatives because of their sophisticated technological capacities, major investments in marine research, and strong legislative frameworks that promote sustainable oceanic activities [10, 11]. Europe has been leading the way with its Blue Growth policy, while North America benefits from substantial innovation and investment in marine industries [12, 13]. Latin America makes substantial contributions to sustainable fishing and marine conservation through its extensive coasts and diverse marine biodiversity [14, 15].

The Indo-Pacific Region extends from the eastern coastlines of Africa to the western coast of the Americas [16, 17]. It includes highly active economies, important maritime routes, and areas with high levels of marine biodiversity. The region's BE growth is influenced by factors such as a fast-rising population, an expanding middle class, and increasing urbanization tendencies. These factors provide both possibilities and problems. The Indo-Pacific region, as identified by the World Bank, encompasses six out of the ten economies with the highest growth rates globally [18–21]. This makes it a significant hub for global trade, investment, and marine commerce [22]. Over the last several years, the Indo-Pacific region has seen a significant increase in BE activities [11, 23]. This growth may be attributed to a combination of causes, such as changes in population patterns, developments in technology, the effects of climate change, and evolving geopolitical dynamics [24, 25]. There is a rising recognition among governments, corporations, and civil society players of the economic potential of the region's marine resources and coastal ecosystems. As a result, there is an increased focus on sustainable development and equitable growth initiatives. This comprehensive literature evaluation aims to investigate the capacity of the BE to enhance international commerce in the Indo-Pacific Region, focusing on Bangladesh, an emerging economy in the region [26–28]. This study seeks to enhance comprehension of how BE concepts might be used to foster economic success, environmental sustainability, and social well-being in the area. It does this by combining previous research, highlighting significant themes, difficulties, and possibilities.

1.1. Contextualizing the Blue Economy in the Indo-Pacific

The Indo-Pacific Region is a large and varied area of marine territory that stretches from the Indian Ocean to the Pacific Ocean. It includes several island countries, coastal states, and important maritime chokepoints. More than 60% of the global population resides in this region, which includes very populated nations such as China, India, Indonesia, and Bangladesh [29]. The region's strategic importance arises from its crucial maritime routes, which enable the transportation of commodities, energy supplies, and information among Asia, Africa, and the Americas [30]. The Indo-Pacific region has significant potential for the BE, owing to its plentiful marine resources, expansive coastline, and advantageous position at the intersection of major global trade routes [31]. The area relies heavily on fisheries and aquaculture as important economic sectors, supporting the lives of millions of people and making substantial contributions to food security and nutrition. The Indo-Pacific region, as reported by the Food and Agriculture Organization (FAO), contributes more than 60% to the total worldwide fish output, establishing its significance in the global seafood industry [32]. Aside from fisheries, the Indo-Pacific region has abundant renewable energy potential, including extensive offshore wind, solar, and tidal resources that are ready to be harnessed. Australia, Japan, and South Korea have made substantial investments in renewable energy infrastructure with the goal of decreasing reliance on fossil fuels and addressing the consequences of climate change [33]. The emergence of offshore wind farms, wave energy converters, and marine biofuel production facilities offers fresh prospects for international corporate cooperation and investment in the area

[34]. The Indo-Pacific region has significant potential for the burgeoning field of marine biotechnology, which has prospects for activities such as bioprospecting, pharmaceutical research, and bioremediation [35]. Coral reefs, mangroves, and marine microorganisms have a vast amount of biodiversity, which has the potential to provide new chemicals and genetic resources that may be used in medicine, agriculture, and industry [36, 37]. Collaborative research endeavors and measures to transfer technology are crucial for realizing the economic worth of marine biotechnology while also guaranteeing fair access and sharing of benefits [38]. Coastal tourism plays a crucial role in stimulating economic development in several Indo-Pacific nations, drawing in millions of tourists annually to unspoiled beaches, coral reefs, and places of cultural significance. Nevertheless, the fast growth of tourist infrastructure and recreational activities presents difficulties for marine ecosystems, such as the deterioration of habitats, pollution, and overuse of natural resources [39]. Sustainable tourism practices, such as the implementation of eco-certification schemes, community-based tourism initiatives, and effective management of marine protected areas, play a crucial role in achieving a harmonious balance between economic growth and environmental protection [40].

The Indo-Pacific Region is susceptible to several maritime security risks, such as piracy, illicit fishing, marine pollution, and transnational organized crime [41]. Inadequate governance systems, conflicts over territory, and geopolitical competitions worsen these difficulties, hindering attempts to advance sustainable BE growth and regional collaboration [42]. To ensure maritime security and maintain peace in the area, it is crucial to improve awareness of maritime activities, enhance law enforcement capacities, and promote discussion and confidence-building measures [43]. Recently, there has been a significant increase in regional cooperation structures and multilateral initiatives in the Indo-Pacific area. These efforts are focused on fostering the growth of the BE and ensuring sustainable ocean governance [44]. The Indian Ocean Rim Association (IORA), the Pacific Islands Forum (PIF), and the Association of Southeast Asian Nations (ASEAN) have all given high attention to marine concerns in their agendas, acknowledging the significance of oceans for economic well-being, food security, and resilience against disasters [45]. The regional forums are central to furthering the BE goal and boosting regional integration by facilitating policy dialogues, exchanging best practices, and mobilizing resources [46].

2. Literature review

2.1. Historical development of the Blue Economy

2.1.1. Early concepts and evolution

The BE has developed over centuries, influenced by humanity's interaction with the oceans and their resources [47–49]. The Phoenicians, Greeks, and Romans, who were ancient maritime civilizations, understood the economic opportunities that the waters offered for trade, fishing, and transportation [50]. Nevertheless, they also recognized the significance of implementing sustainable practices in order to guarantee the enduring sustainability of marine resources [51]. Initial restrictions and traditional practices, such as fishing quotas and seasonal closures, were implemented with the goal of preventing excessive exploitation and preserving ecological equilibrium [52]. The contemporary period has seen a rise in the prominence of the BE due to growing apprehensions regarding overfishing, pollution, and climate change [53]. The 1982 United Nations Convention on the Law of the Sea (UNCLOS) was a crucial development in global initiatives to regulate ocean resources and safeguard marine ecosystems [54]. The United Nations Convention on the Law of the Sea (UNCLOS) created the legal structure for determining maritime borders, exploiting resources, and protecting the environment, providing the basis for effective and sustainable management of the oceans. The significance of the BE in attaining global sustainability has been strengthened by subsequent international accords, including Agenda 21 from the 1992 Earth Summit and the United Nations Sustainable Development Goals (SDGs) of 2015 [55, 56]. The Sustainable Development Goals (SDGs) offer a comprehensive framework for tackling interconnected issues such as poverty, hunger, health, education, gender equality, clean water, energy, economic growth, industry, innovation, inequality, cities, consumption, climate change, oceans, biodiversity, peace, and partnerships [55, 56].

In recent research, there has been a growing emphasis on studying the relationship between the BE and the United Nations' Sustainable Development Goals (SDGs), as well as the agreement among stakeholders regarding this connection [57, 58]. An analysis of literature from 1998 to 2018 shows a significant connection between the BE and SDGs [14–17, 58]. These objectives specifically address topics, such as marine life, terrestrial life, peace, justice, strong institutions, and partnerships for achieving the goals [58]. Stakeholders have expressed a specific inclination towards SDG 3 (Good Health and Well-Being) and SDG 8 (Decent Work and Economic Growth) in relation to the BE, as stated by the OECD in 2020 [56, 58]. The level of stakeholder engagement at the intersection of the BE and SDGs differs depending on the specific circumstances and geographical areas, indicating a range of various objectives and interests [57, 58]. Key stakeholders are crucial in promoting sustainable development goals within the context of the BE. The stakeholders encompass governments, intergovernmental organizations, non-governmental organizations, private sector companies, research institutions, and local communities. Governments have a vital role in developing laws, regulations, and incentives to support the advancement of sustainable ocean management and BE projects [58]. Intergovernmental organizations, such as the United Nations, and regional groups, such as the European Union, promote international collaboration, enhance capabilities, and exchange knowledge regarding the most effective methods in the BE [48, 58]. Non-governmental organizations (NGOs) and civil society groups support and promote environmental conservation, social equity, and human rights as part of the BE agenda [55, 59, 60]. Private sector entities play a crucial role in driving innovation, investment, and entrepreneurship in sectors such as marine technology, renewable energy, and sustainable tourism [61]. Research institutions produce scientific information, carry out evaluations, and offer technical support to facilitate evidence-based decision-making in the development of the BE [62]. Local communities, particularly those who rely on marine resources for basic sustenance, play a crucial role as stakeholders in the management of coastal areas, the regulation of fisheries, and the implementation of ecotourism projects [63].

2.2. Academic and institutional definitions of the Blue Economy

The BE comprises several economic activities associated with the water and coastal areas, such as fisheries, aquaculture, tourism, shipping, renewable energy, and biotechnology. Although the BE encompasses a wide range of activities, there is currently no universally agreed-upon definition for it. However, it is often recognized as a system for advancing sustainable development by utilizing the economic opportunities of the oceans and safeguarding their ecological health.

The BE is frequently described by academic and institutional sources as having multiple dimensions, with a particular emphasis on the interconnections between economic, social, and environmental factors. The BE, as defined by the World Bank, refers to the responsible utilization of ocean resources to promote economic development, enhance people's well-being, and create employment opportunities, all while safeguarding the health of marine ecosystems [58, 64]. The European Union's BE Strategy aims to promote innovation, investment, and collaboration in crucial sectors, such as marine biotechnology, offshore energy, and maritime transport [65]. It is crucial to comprehend the many conceptualizations of the BE in academic study. The study [66] emphasizes the lack of clarity surrounding the term «BE,» since it has frequently been used interchangeably with related concepts, such as «ocean economy» or «marine economy,» without precise definitions. In addition, words such as ocean economy (OE), marine economy (ME), and blue growth (BG) have been used interchangeably in the literature [66]. The use of several terms in this context is a result of the intricate and ever-changing nature of issues related to the BE. Due to regional, sectoral, or disciplinary viewpoints, scholars and practitioners may employ varying terminology, which adds to the diversity of definitions and conceptualizations. Although there are difficulties in defining terms, scholarly studies on the BE are steadily growing, focusing on topics such as governance, sustainability, innovation, and economic development. Researchers seek to enhance comprehension and provide guidance for policy and practice in utilizing the economic capabilities of oceans while simultaneously protecting marine ecosystems and promoting social fairness by analyzing various conceptualizations and techniques.

2.3. Regional trends and Bangladesh economy

Within the specific circumstances of Bangladesh, the BE possesses considerable capacity to stimulate economic expansion and alleviate poverty. Due to its vast coastline, numerous marine resources, and advantageous location in the Bay of Bengal, Bangladesh is in a favorable position to capitalize on the BE. The National Oceanographic and Maritime Institute (NOAMI) of the country plays a vital role in conducting research and formulating policies regarding marine affairs. Additionally, government initiatives such as the Bangladesh Delta Plan 2100 and the BE Cell are focused on fostering sustainable ocean management and promoting maritime development.

There is a shift occurring in the economic environment of the Indo-Pacific area, with an increased emphasis on the interconnection of countries and the trade that takes place in the maritime sector. The focus on BE initiatives has been motivated by increasing apprehensions regarding maritime security and the endeavor for sustainable development. Regional organizations fostering cooperation among member states in the BE encompass the Asia-Pacific Economic Cooperation (APEC) and the Indian Ocean Rim Association (IORA) [67]. The United Nations' SDGs emphasize the need to use marine resources in a sustainable manner. This reflects the global consensus on the significance of the BE in achieving socio-economic objectives.

Due to its extensive coastline and abundant marine resources, Bangladesh is strategically positioned to capitalize on the BE. The fishing sector of the nation sustains the livelihoods of millions of individuals and provides a substantial economic impact. Bangladesh has exhibited its dedication to sustainable utilization of maritime resources through its investments in renewable energy initiatives and offshore gas development [26, 68]. Bangladesh's marine ecosystems face a danger to their sustainability due to factors such as overfishing, pollution, and climate change. These challenges also hinder the country's capacity to fully capitalize on the potential benefits of the BE [69, 70]. To address these challenges and promote sustainable development in the maritime sector, collaborative research and innovative solutions are necessary.

In order to effectively capitalize on the potential of the BE, Bangladesh must actively engage in global collaborative projects. Participation in conferences, such as IORA and APEC, provides opportunities for collaboration with regional and global partners. The study [26] proposes that Bangladesh could enhance its marine commerce and attract foreign investments for BE initiatives through the establishment of trade agreements and knowledge-sharing platforms. The study [71] suggests that Bangladesh's BE plan could be advantageous if it aligns with China's projected Belt and Road Initiative (BRI). This program has the ability to create infrastructure and improve connections in the marine sector.

Europe's extensive technological expertise in BE industries offers opportunities for collaboration with Bangladesh. Collaborative research projects, agreements to transfer technology, and attempts to enhance skills can help facilitate the sharing of knowledge and strengthen links between two parties. Moreover, European investment in Bangladesh's BE infrastructure has the potential to generate employment opportunities and promote sustainable development [43]. The European Union's Blue Growth Strategy focuses on fostering collaborations with third parties and promoting sustainable growth in the marine sector to achieve common objectives [72].

2.4. Analytical context in relation to the SDG framework

The BE is strongly associated with the United Nations SDGs, specifically Goal 14: Life Below Water, which advocates for the preservation and sustainable utilization of ocean resources. The BE can help address poverty, food security, and climate resilience by supporting sustainable fisheries, coastal tourism, and marine renewable energy. This approach can advance multiple SDGs at the same time. However, in order to fully realize the potential of the BE, it is necessary to adopt integrated and inclusive strategies that give priority to environmental sustainability, social equality, and economic viability. The inherent contradictions between these two discussions necessitate solutions that encompass the advantages linked to the maritime economy while acknowledging and tackling its risks. Within the framework of the BE, the SDGs established by the United Nations indicate that

economic progress should be both inclusive and environmentally friendly. They emphasize the importance of achieving a harmonious balance between the economic, social, and environmental aspects of sustainable development in relation to the oceans [58, 73]. The United Nations has designated the period from 2021 to 2030 as the 'Decade of Ocean Science for Sustainable Development' with the aim of aiding endeavors to halt the deterioration of ocean health and unite ocean stakeholders globally under a shared framework. The objective of this framework is to ensure that ocean science can effectively assist governments in establishing better circumstances for the sustainable development of the ocean. The World Bank places significant importance on achieving a balance between the three pillars of sustainable development in the context of oceans, which is a crucial aspect of the BE [58, 74]. The United Nations' SDGs offer a comprehensive framework for addressing global concerns, including those related to the BE. The expansion of the BE and the sustainable governance of marine resources are two objectives that are intricately linked to many SDGs. SDG 14, known as "Life Below Water," centers on the sustainable utilization of seas, oceans, and marine resources [75]. The text advocates for the implementation of measures to safeguard marine and coastal ecosystems, halt marine pollution, and ensure the sustainable management of fisheries and aquaculture. The United Nations in 2015 identified several SDGs that have consequences for the BE. One of the SDGs, specifically SDG 12, focuses on sustainable consumption and production [76]. This goal highlights the importance of reducing marine pollution, addressing the impacts of climate change, and promoting sustainable practices in the use of resources.

Implementation of the SDGs and BE strategies can enhance policy coherence and facilitate integrated approaches to promoting sustainable development in Bangladesh. Bangladesh may effectively track advancements, detect deficiencies, and prioritize measures to attain sustainable outcomes by incorporating SDG indicators into national development strategies and integrating BE objectives into relevant sectors [77]. Incorporating individuals from many sectors, such as the public, commercial, academic, and civil society, into the implementation of the SDGs, can foster a sense of ownership, cooperation, and innovation. This, in turn, can enhance the inclusivity and effectiveness of BE initiatives [8].

2.5. Comparative analysis of Blue Economy strategies adopted by different countries in the region

An examination of BE policies implemented by several nations in the Indo-Pacific region demonstrates a wide range of tactics, goals, and results. Australia and New Zealand have made sustainable fisheries management, marine conservation, and tourist development a top priority in their BE agendas [78]. These nations have adopted fisheries management systems based on quotas, created marine protected areas, and encouraged sustainable tourism practices to conserve marine ecosystems and assist coastal populations. Countries such as Singapore and South Korea have prioritized the development of marine biotechnology, offshore aquaculture, and renewable energy as major components of their BE policies [79]. These nations have made investments in research and innovation centers, technology parks, and regulatory structures to promote the expansion of BE sectors and improve their international competitiveness in developing markets. Small island developing nations (SIDS) in the Pacific, such as Fiji and Samoa, encounter distinctive obstacles and prospects in the advancement of the BE. This is due to their restricted resources, susceptibility to climate change, and reliance on marine resources for sustenance [80]. These nations have given priority to community-based resource management, sustainable tourism, and renewable energy initiatives to encourage the development of an inclusive and resilient BE. Additionally, they are also tackling challenges related to poverty reduction and social fairness (*Table 1*).

3. Methodology

The approach used in this systematic literature review consisted of a thorough search strategy to discover pertinent academic papers, reports, and publications related to the BE in the Indo-Pacific Region. The search was conducted by using electronic databases such as PubMed, Scopus, Web of Science, and Google Scholar. A mix of keywords and Boolean operators was used to achieve a comprehensive search [81]. The search

Table 1
Comparative Analysis of Blue Economy Strategies Adopted by Different Countries in the Region

Country	Blue Economy Strategy	Key Initiatives
Australia	BE Strategic Framework (BESF) focusing on sustainable marine industries, innovation, and economic development.	— Investing in marine research and technology development. — Supporting aquaculture and sustainable fisheries management.
Indonesia	National Action Plan for the BE (NAPBE) emphasizing sustainable fisheries, marine tourism, and coastal community empowerment.	— Strengthening marine conservation and protected areas. — Promoting ecotourism and sustainable coastal development.
Japan	Blue Growth Strategy promoting offshore renewable energy, marine biotechnology, and sustainable fisheries.	— Expanding offshore wind farms and promoting ocean energy technologies. — Enhancing aquaculture production and seafood processing.
Philippines	Philippine Development Plan (PDP) prioritizing marine biodiversity conservation, coastal resilience, and inclusive growth in coastal communities.	— Establishing marine protected areas and sustainable fishing zones. — Supporting small-scale fisherfolk livelihood programs.
Thailand	Thailand 4.0 strategy integrating digital innovation and sustainable development, including smart fisheries management and marine resource conservation	— Implementing digital monitoring systems for fisheries management. — Promoting sustainable aquaculture practices

Source: Developed by the authors based on various national government reports and documents on BE strategies and initiatives.

was refined by using key phrases such as "Blue Economy," "Indo-Pacific," "maritime economy," "ocean resources," "sustainable development," and "international business" in different combinations. By continuously improving the search strategy via preliminary searches and expert input, we were able to optimize it to include relevant material. The articles were chosen according to predetermined criteria for inclusion. These criteria included that the articles had to be published in peer-reviewed journals, conference proceedings, or respected institutional reports. Furthermore, the articles had to particularly address subjects linked to the BE within the Indo-Pacific Region. In addition, papers should include pertinent analysis on the trajectory of development, key players, legislative frameworks, technical breakthroughs, trends in trade and investment, as well as the obstacles and possibilities for expanding international companies. The exclusion criteria were used to exclude publications that were not written in English, those that were not directly related to the BE or the topic of the review, duplicates, or those that did not provide enough information for data extraction. The screening and selection procedure included an initial evaluation based on titles and abstracts to ascertain the relevance of the study to the subject and inclusion criteria. Afterwards, complete publications containing possibly relevant information were obtained and analyzed separately by two researchers to determine their ultimate inclusion in the review. Any inconsistencies were addressed by discussion and agreement among the researchers. The process of data extraction was carried out in a methodical manner, using a pre-established data extraction form to collect essential information from the chosen studies. This information included details such as the author(s), publication year, study technique, principal results, and their relevance to the research aims. Thematic synthesis was used to analyze the literature on the growth trajectory, stakeholders, policy frameworks, technological advancements, trade and investment trends, challenges, and opportunities for international business expansion in the Indo-Pacific BE [82]. This analysis aimed to identify patterns, trends, and gaps in the research. The chosen studies were evaluated for quality us-

ing established criteria that are applicable to their individual methodologiea. This evaluation took into account elements such as the rigor of the methods used, the theoretical framework used, the sources of data, and the transparency of the conclusions. Rigorous studies were accorded more significance in the analysis of findings, whereas research of poorer quality was approached with caution or disregarded if it was judged methodologically flawed. The synthesized data were thematically evaluated to find prominent themes, patterns, and trends within the literature [83]. The findings were analyzed within the framework of the study goals, with an emphasis on comprehending the existing information, pinpointing deficiencies and constraints, and producing valuable insights for future research, policy formulation, and practical applications. The results of the systematic literature review were presented in a well-organized narrative framework, focusing on important themes and subtopics related to the study goals. This was done to make it easier for stakeholders, policymakers, researchers, and practitioners to comprehend and use the findings.

4. Findings and discussion

The systematic literature review yielded valuable insights into various aspects of the BE in the Indo-Pacific region, encompassing its growth trajectory, key stakeholders, policy frameworks, technological advancements, trade and investment trends, as well as challenges and opportunities for international business expansion.

4.1. Growth trajectory

The rise of BE sectors in the Indo-Pacific Region from 2000 to 2020 demonstrates a significant and consistent increase in major sectors, such as fisheries, aquaculture, marine transport, and tourism. The growing trend highlights the region's substantial role in contributing significantly to the worldwide development of the BE. During the span of twenty years, the fisheries and aquaculture industries saw significant development rates, consistently enhancing their contributions to the area economy. Starting with small proportions in 2000, both the fisheries and aquaculture industries have consistently grown, with fisheries increasing from 5% to 25% and aquaculture from 8% to 28% by 2020 [84]. The significant expansion may be attributed to causes such as technical progress, rising demand for seafood products, and favorable regulatory frameworks that encourage sustainable resource management and the development of aquaculture. The Indo-Pacific region's strategic geographic position and function as a significant center for global business have made maritime transit a crucial catalyst for the creation of the BE. The region's significance in enabling international commerce and connection is shown by the steady increase in marine transport, which has grown from 6% in 2000 to 26% in 2020 [85]. The region's role as a significant participant in global marine commerce networks has been strengthened by investments in port infrastructure, shipping logistics, and maritime security. Furthermore, tourism saw steady growth during the given time frame, propelled by enhanced infrastructure, promotional campaigns, and increasing disposable incomes. The region's many natural landmarks, cultural heritage sites, and welcoming amenities have enticed an increasing number of local and global visitors, hence fostering the growth of coastal villages and industries. Overall, the results emphasize the growing importance of the Indo-Pacific region in driving the growth of the BE on a worldwide scale. The continuous expansion in fisheries, aquaculture, marine transport, and tourism highlights the region's capacity to stimulate economic growth, promote social progress, and ensure environmental sustainability by making smart investments and engaging in cooperative efforts in BE sectors.

4.2. Key stakeholders and involvement

The key parties engaged in BE projects in the Indo-Pacific region include governments, corporations, universities, civil society groups, and international development agencies. Tirumala and Tiwari (2022) state that governments have a crucial responsibility in creating policies, legislation, and investment incentives to foster the growth and sustainability of the BE. Several nations in the area have created specialized BE ministries or task forces to facilitate coordination between different agencies and ensure policy consistency across various sectors [87]. Businesses have a crucial role in promoting innovation, investment, and market growth in BE industries. Businesses, ranging from individual fishers to large multinational organizations,

have a vital role in extracting resources, integrating them into the value chain, and gaining access to markets [88]. In the BE, sustainable company practices such as eco-certification, fair trade, and corporate social responsibility are becoming more and more important in order to stay competitive in the market and gain the trust of investors [89]. Academia and research institutions support BE projects by conducting scientific research, developing technology, and providing capacity-building activities [86]. Collaborative research initiatives, information sharing platforms, and training programs facilitate the connection between scientific knowledge gathering and policy implementation, promoting evidence-based decision-making and innovation in BE sectors. Civil society groups are essential in campaigning for environmental protection, social fairness, and community empowerment in BE efforts [90]. NGOs, CBOs, and indigenous peoples' groups often function as monitors, alerting others to the environmental and social consequences of BE operations and promoting sustainable management practices and legislative changes. Upadhyay and Mishra (2020) state that international development agencies, multilateral organizations, and donor agencies provide monetary and technical aid to endorse BE projects and capacity-building programs in the Indo-Pacific region. These organizations use their knowledge, networks, and resources to fill gaps in governance, enhance institutional capacity, and encourage the exchange of information and collaboration across countries in the development of the BE (*Table 2*).

4.3. Policy frameworks

An examination of the policy frameworks that promote the growth of the BE in the Indo-Pacific region has revealed a wide range of strategies designed to encourage economic diversification, innovation, and the creation of employment opportunities. The identified policy areas include integrated ocean management, blue growth initiatives, maritime security and governance, and climate change adaptation and resilience [55]. Integrated ocean management efforts seek to achieve a harmonious equilibrium between the many demands placed on marine resources, with the goal of reducing disputes and fostering sustainable development. These methods often need cooperation across several sectors and collaboration with stakeholders to enable the efficient management and preservation of maritime ecosystems while also supporting economic activity. Blue growth strategies aim to facilitate the sustainable expansion of BE sectors by implementing specific regulations, making strategic investments, and fostering collaborations. These techniques seek to maximize the commercial value of marine resources while ensuring environmental preservation and promoting social inclusiveness. Blue growth initiatives aim to stimulate economic success and job creation in coastal towns by promoting innovation, entrepreneurship, and the development of value chains. Marine security and governance policies are essential for guaranteeing the safety, security, and long-term viability of marine operations in the area. Efforts to improve knowledge of marine areas, bolster law enforcement powers, and encourage collaboration among neighboring countries are crucial in the fight against unlawful activities including piracy, illicit fishing, and maritime pollution. These measures also support the growth of maritime commerce, transportation, and connectivity. Climate change adaptation and resilience policies aim to include climate factors into BE development plans, fostering ecological resilience and community livelihoods in response to climate-related risks and vulnerabilities [91]. These policies have the objective of developing the ability to adjust, improving readiness for disasters, and encouraging sustainable ways for managing resources in order to reduce the effects of climate change on BE sectors and coastal communities (*Table 3*). However, the investigation also identified difficulties with the consistency of policies, the alignment of regulations, and the absence of effective governance, highlighting the need for more coordination and cooperation among all involved. To tackle these problems, it is necessary to coordinate policy goals, simplify regulatory structures, and enhance institutional capabilities in order to promote sustainable and equitable growth of the BE in the Indo-Pacific region.

4.4. Advancements in Blue Technology

Technological innovations play an influential role in driving the expansion of the BE in the Indo-Pacific region. They enable more effective extraction of resources, integration of value chains, and access to markets. Remote

Table 2
Key stakeholders and their involvement in Blue Economy initiatives

Stakeholder	Role
Governments	Formulate policies, regulations, and investment incentives. Coordinate inter-agency efforts.
Businesses	Drive innovation, investment, and market development. Implement sustainable business practices.
Academia	Conduct scientific research, technology development, and capacity-building activities.
Civil Society Orgs	Advocate for environmental conservation, social equity, and community empowerment. Raise awareness and promote sustainable management practices.
International Agencies	Provide financial and technical assistance. Support capacity-building initiatives. Facilitate knowledge sharing and South-South cooperation

Source: Developed by the authors.

Table 3
Policy Frameworks Supporting Blue Economy Development in the Indo-Pacific Region

Policy Framework	Description
Integrated Ocean Management	Balances competing uses of marine resources. Minimizes conflicts. Promotes sustainable development.
Blue Growth Strategies	Promotes economic diversification, innovation, and job creation in BE sectors. Involves public-private partnerships and stakeholder consultations.
Maritime Security and Governance	Enhances maritime domain awareness. Strengthens law enforcement capabilities. Fosters regional cooperation to address maritime security challenges.
Climate Change Adaptation and Resilience	Integrates climate considerations into BE development. Promotes ecosystem resilience and community livelihoods

Source: Developed by the authors.

sensing technologies, such as satellite imaging and aerial drones, allow for the continuous monitoring of maritime conditions, improving fisheries management methods, and aiding in the development of sustainable aquaculture operations [92]. Autonomous underwater vehicles (AUVs) provide accurate data gathering and investigation of marine ecosystems, making significant contributions to scientific study, mineral exploitation, and offshore infrastructure inspection [93]. The development of renewable energy technologies, such as offshore wind turbines and wave energy converters, has favorable prospects for the generation of clean energy and the reduction of carbon emissions in marine transport and coastal infrastructure. Moreover, advancements in marine biotechnology, such as genetic manipulation and the exploration of marine resources, allow for the use of marine creatures in the development of medications, biomaterials, and bioremediation techniques [94]. Nevertheless, despite these favorable circumstances, concerns have been raised regarding the ecological consequences of technological implementation, the sufficiency of regulatory structures to oversee developing technologies, and fair access to technology among various stakeholders [95]. To tackle these challenges, a comprehensive strategy is needed that combines environmental sustainability, regulatory supervision, and inclusive innovation initiatives. Responsible technology deployment involves evaluating and reducing any environmental hazards linked to new technologies integrating sustainability and precautionary principles into the processes of technology development and

deployment. Enhancing regulatory frameworks entails revising current laws and regulations to tackle new challenges brought about by technological progress (*Table 4*). Meanwhile, ensuring fair access to technology involves advocating for the transfer of technology, fostering the development of skills and knowledge, and facilitating the sharing of information among various groups, especially in developing nations and marginalized communities.

4.5. Trade and investment trends

International trade and investment in BE sectors were observed to be on the rise in the Indo-Pacific, driven by growing demand for sustainable products and services, technological innovation, and regional cooperation (*Table 5*). Fisheries and aquaculture products, renewable energy projects, and marine biotechnology innovations were identified as key areas of investment and market growth [96].

Table 4

Technological advancements impacting Blue Economy growth in the Indo-Pacific Region

Technological Advancements	Description
Remote sensing technologies	Enable real-time tracking of fishing vessels. Detection of illegal fishing activities. Assessment of marine habitats.
Autonomous underwater vehicles	Advance scientific research, mineral exploration, and offshore infrastructure inspection.
Renewable energy technologies	Make renewable energy production more cost-effective and scalable. Contribute to energy security and environmental sustainability.
Marine biotechnology innovations	Accelerate discovery and commercialization of novel compounds and genetic resources from marine organisms

Source: Developed by the authors.

Table 5

Trade and investment trends in Blue Economy sectors in the Indo-Pacific

Sector	Key Trends and Drivers	Challenges and Impediments
Fisheries and aquaculture	– Growing demand for sustainable seafood products	– Market access barriers
	– Technological innovation and value chain integration	– Overfishing and resource depletion
	– Regional cooperation and trade agreements	– Environmental degradation and habitat loss
Renewable energy projects	– Shift towards clean energy sources and decarbonization	– Policy and regulatory uncertainties
	– Investment in offshore wind, wave, and tidal energy	– Lack of infrastructure and financing
	– Potential for job creation and economic development	– Social acceptance and community engagement
Marine biotechnology	– Exploration of marine genetic resources for pharmaceuticals	– Intellectual property rights and bioprospecting regulations
Innovations	– Development of biomaterials, biofuels, and bioremediation	– Ethical and cultural considerations
	– Partnerships between academia, industry, and government	– Access to funding and research infrastructure

Source: Developed by the authors.

However, challenges such as market access barriers, socio-economic disparities, and governance issues were identified as potential impediments to realizing the full economic potential of BE sectors in the region [97].

4.6. Challenges and opportunities

The analysis identified a range of difficulties and possibilities for expanding international business in the Indo-Pacific BE. The primary difficulties that need to be addressed are the deterioration of the environment and the effects of climate change [58]. These challenges pose a significant danger to the long-term viability of marine ecosystems and the livelihoods that rely on them. To tackle these difficulties, it is necessary to make collaborative efforts in reducing pollution, overfishing, habitat loss, and other human-caused pressures. Additionally, it is important to adopt policies that help us adapt to the impacts of climate change, including rising sea levels and ocean acidification. Socio-economic inequalities provide a notable obstacle since disadvantaged areas often experience the adverse consequences of BE activities. Promoting fair and equal access to resources, opportunities, and rewards is crucial for building social inclusion and diminishing inequality. Furthermore, deficiencies in governance, such as insufficient enforcement of regulations,

Table 6

Challenges and opportunities for international business expansion in the Indo-Pacific Blue Economy

Aspect	Challenges	Opportunities
Regulatory environment	Complex and inconsistent regulations across countries may hinder international business operations.	Harmonization of regulations and standards could facilitate cross-border trade and investment in BE sectors.
Access to finance	Limited access to financing, especially for small and medium-sized enterprises (SMEs), may constrain business expansion.	Increased availability of investment opportunities, venture capital, and financial support for BE projects and startups.
Infrastructure development	Inadequate infrastructure, such as ports, transportation networks, and energy facilities, may impede business growth.	Investments in infrastructure development could enhance connectivity and accessibility to BE resources and markets.
Technology and innovation	Limited adoption of advanced technologies and innovation may hinder competitiveness and efficiency.	Embracing technology and innovation can lead to increased productivity, cost savings, and new market opportunities in BE sectors.
Market access and trade	Trade barriers, tariffs, and non-tariff measures may restrict market access and hinder international trade.	Bilateral and multilateral trade agreements, as well as regional economic integration, can facilitate market access and promote trade in BE products and services.
Environmental sustainability	Environmental degradation and resource depletion pose risks to long-term business viability and reputation.	Adoption of sustainable practices, eco-certifications, and corporate social responsibility (CSR) initiatives can enhance competitiveness and brand value.
Human capital development	Skills gaps and workforce shortages in specialized areas may limit business growth and innovation.	Investments in education, training, and capacity-building programs can develop a skilled workforce equipped to address the evolving needs of the BE.
Stakeholder engagement	Limited collaboration and coordination among stakeholders may hinder collective action and project implementation	Engaging with diverse stakeholders, including governments, communities, and NGOs, can foster partnerships, knowledge sharing, and social acceptance for BE initiatives

Source: Developed by the authors.

corruption, and insufficient institutional capacity, provide challenges to the efficient administration of the BE and the achievement of sustainable development [59]. Nevertheless, within these difficulties are prospects for global corporate expansion and enduring development. Technological innovation, such as advancements in remote sensing, renewable energy, and marine biotechnology, creates opportunities for using resources, creating value, and developing new markets. Utilizing these advancements may improve productivity, effectiveness, and environmental friendliness in several areas of the BE. The rise in market demand for sustainable goods and services offers an additional opportunity for worldwide company development. Regional collaboration and agreements provide prospects for consolidating resources, exchanging expertise, and synchronizing endeavors to tackle mutual obstacles and use shared prospects. Furthermore, by implementing inclusive business models that prioritize environmental stewardship, social responsibility, and community engagement, businesses can generate shared value for themselves, communities, and ecosystems. By incorporating sustainability principles into their strategies and operations, multinational corporations can contribute to the achievement of sustainable and inclusive BE development in the Indo-Pacific region (*Table 6*).

5. Conclusion

The comprehensive analysis of the BE in the Indo-Pacific area uncovers a dynamic environment marked by many difficulties and possibilities. By examining important data, some noteworthy discoveries have surfaced. The region's potential for economic development is highlighted by the growth trajectory of BE industries such as fisheries, aquaculture, marine transport, and tourism. Nevertheless, this expansion is not devoid of intricacies, as shown by the many obstacles that have been found. The participation of many stakeholders, such as national governments, international organizations, NGOs, and the corporate sector, emphasizes the cooperative endeavors being carried out to advance sustainable BE projects. Policy frameworks are essential for steering these efforts, focusing on ensuring consistency in regulations, promoting the development of infrastructure, and involving stakeholders. Technological innovations play a pivotal role in driving the expansion of the BE by providing creative solutions for managing resources, improving operational efficiency, and accessing markets. Remote sensing technology, autonomous underwater vehicles, and artificial intelligence are important advancements that are influencing the future of maritime sectors in the area. Although there has been progress, there are still notable obstacles to overcome, such as legislative impediments, limited financial availability, and concerns over environmental sustainability. To overcome these problems, it is necessary to maintain ongoing cooperation, investment, and innovation in order to fully exploit the potential of the BE and ensure its sustainability in the long run. Ultimately, the Indo-Pacific region is now at a crucial point in its progress towards a sustainable and inclusive BE, where it has the potential to effectively use its marine resources for development. By using the refined knowledge and frameworks outlined in this comprehensive analysis, those involved may effectively traverse the intricacies of the BE and plan a path towards a more successful and resilient future.

REFERENCES

1. Germond-Duret C. Framing the Blue Economy: Placelessness, Development and Sustainability. *Development and Change*. 2022;53(2): 308–334. URL: https://doi.org/10.1111/dech.12703
2. Choudhary P., G V.S., Khade M., Savant S., Musale A., G R.K.K., et al. Empowering blue economy: From underrated ecosystem to sustainable industry. *Journal of Environmental Management*. 2021;291:112697. URL: https://doi.org/10.1016/j.jenvman.2021.112697
3. Okafor-Yarwood I., Kadagi N.I., Miranda N.A.F., Uku J., Elegbede I.O., Adewumi I.J. The Blue Economy–Cultural Livelihood–Ecosystem Conservation Triangle: The African Experience. *Frontiers in Marine Science*. 2020;7: 542908. URL: https://doi.org/10.3389/fmars.2020.00586

4. Asif M. Blue Economy and Power Politics in the Indian Ocean: Challenges and Opportunities. *Journal of Nautical Eye and Strategic Studies*. 2022;2(2):2–37.
5. Singh S. The blue economy in the Indo-Pacific: prospects and challenges in the Indian ocean region. 2022.
6. Voyer M., Schofield C., Azmi K., Warner R., McIlgorm A., Quirk G. Maritime security and the Blue Economy: intersections and interdependencies in the Indian Ocean. *Journal of the Indian Ocean Region*. 2018;14(1):28–48. URL: https://doi.org/10.1080/19480881.2018.1418155
7. Bethel B.J., Buravleva Y., Tang D. Blue Economy and Blue Activities: Opportunities, Challenges, and Recommendations for The Bahamas. *Water*. 2021;13(10):1399. URL: https://doi.org/10.3390/w13101399
8. Patil P.G., Virdin J., Colgan C.S., Hussain M.G., Failler P., Vegh T. Toward a Blue Economy: A Pathway for Bangladesh's Sustainable Growth in Bangladesh. Washington, DC: The World Bank Group. 2018. URL: http://hdl.handle.net/10986/30014
9. Humanes J.B. Just Sustainability Transitions in the Blue Economy: Towards Blue Justice in Small-Scale Artisanal Fisheries in the. 2022.
10. Novaglio C., Bax N., Boschetti F., Emad G.R., Frusher S., Fullbrook L., et al. Deep aspirations: towards a sustainable offshore Blue Economy. *Reviews in Fish Biology and Fisheries*. 2022;32(1):209–230. URL: https://doi.org/10.1007/s11160–020–09628–6
11. Upadhyay D.K., Mishra M. Blue economy: Emerging global trends and India's multilateral cooperation. *Maritime Affairs: Journal of the National Maritime Foundation of India*. 2020;16(1):30–45. URL: https://doi.org/10.1080/09733159.2020.1785087
12. Hadjimichael M. A call for a blue degrowth: Unravelling the European Union's fisheries and maritime policies. *Marine Policy*. 2018;94:158–164. URL: https://doi.org/10.1016/j.marpol.2018.05.007
13. Schultz-Zehden A., Weig B., Lukic I. Maritime Spatial Planning and the EU's Blue Growth Policy: Past, present and future perspectives. *Maritime Spatial Planning: past, present, future*. 2019; 121–149.
14. Rees S.E., Foster N.L., Langmead O., Pittman S., Johnson D.E. Defining the qualitative elements of Aichi Biodiversity Target 11 with regard to the marine and coastal environment in order to strengthen global efforts for marine biodiversity conservation outlined in the United Nations Sustainable Development Goal 14. *Marine Policy*. 2018;93:241–250. URL: https://doi.org/10.1016/j.marpol.2017.05.016
15. Diz D., Johnson D., Riddell M., Rees S., Battle J., Gjerde K., et al. Mainstreaming marine biodiversity into the SDGs: The role of other effective area-based conservation measures (SDG 14.5). *Marine Policy*. 2018;93:251–261. URL: https://doi.org/10.1016/j.marpol.2017.08.019
16. Haruko W. The Indo-Pacific concept: geographical adjustments and their implications. 2020.
17. Nkala S. Africa and the Indo-Pacific Dynamics: China, India, and Japan's Strategic Competition in Africa's Indian Ocean States. *Journal of African Foreign Affairs*. 2021;8(3).
18. Heiduk F., Wacker G. From Asia-Pacific to Indo-Pacific: significance, implementation and challenges. 2020. URL: https://doi.org/https://doi.org/10.18449/2020RP09
19. Li M. The Belt and Road Initiative: geo-economics and Indo-Pacific security competition. *International Affairs*. 2020;96(1):169–187. URL: https://doi.org/10.1093/ia/iiz240
20. Sudan F.K. Indo-Pacific Strategy and India's Opportunities and Challenges for Regional Economic Cooperation and Integration: An Exploratory Review. *Global Economics Science*. 2022. URL: https://doi.org/10.37256/ges.3220221290
21. Richhariya K. Economic Multilateralism in the Indo-Pacific Region 1. In: Multilateralism in the Indo-Pacific. Routledge; 2022:44–59.
22. Gurunathan A., Moorthy R. Riding the Indo-Pacific Wave: India–ASEAN Partnership Sans RCEP. *India Quarterly: A Journal of International Affairs*. 2021;77(4):560–578. URL: https://doi.org/10.1177/09749284211047707
23. Louey P. The Pacific blue economy: An instrument of political maneuver. *Marine Policy*. 2022;135:104880. URL: https://doi.org/10.1016/j.marpol.2021.104880
24. Bond P. Blue Economy threats, contradictions and resistances seen from South Africa. *Journal of Political Ecology*. 2019;26(1):341–362. URL: https://doi.org/10.2458/v26i1.23504
25. Jouffray J.B., Blasiak R., Nyström M., Österblom H., Tokunaga K., Wabnitz C., et al. Blue Acceleration: An ocean of risks and opportunities. *Ocean Risk and Resilience Action Alliance (ORRAA) Report*. 2021;42:1–42.

26. Bhuyan M.S., Islam M.N., Ali M.M., Rashed-Un-Nabi M., Alam M.W., Das M., et al. Blue Economy Prospects, Opportunities, Challenges, Risks, and Sustainable Development Pathways in Bangladesh. *Global Blue Economy*. 2022; 147–194. URL: https://doi.org/10.1201/9781003184287–6
27. Hossain D., Islam M.S. Unfolding Bangladesh-India maritime connectivity in the Bay of Bengal region: a Bangladesh perspective. *Journal of the Indian Ocean Region*. 2019;15(3):346–355. URL: https://doi.org/10.1080/19480881.2019.1646570
28. Islam M.W., Sarker T. Chapter 24 Financing sustainable coastal and maritime tourism in the blue economy of the Asia-Pacific. In: *De Gruyter Handbook of Sustainable Development and Finance*. De Gruyter; 2022:543–566. URL: https://doi.org/10.1515/9783110733488–024
29. Chen M., Sui Y., Liu W., Liu H., Huang Y. Urbanization patterns and poverty reduction: A new perspective to explore the countries along the Belt and Road. *Habitat International*. 2019;84:1–14.
30. Paszak P. The Malacca Strait, the South China Sea and the Sino-American Competition in the Indo-Pacific. *Journal of Asian Security and International Affairs*. 2021;8(2):174–194. URL: https://doi.org/10.1177/23477970211017494
31. Shah J. The Emerging Blue Economy: Its Development and Future Propsects. *Liberal Studies.* 2019;4:61.
32. Mehanna S.F. Egyptian Marine Fisheries and its sustainability. In: Sustainable fish production and processing. Elsevier; 2022:111–140.
33. Sharvini S.R., Noor Z.Z., Chong C.S., Stringer L.C., Yusuf R.O. Energy consumption trends and their linkages with renewable energy policies in East and Southeast Asian countries: Challenges and opportunities. *Sustainable Environment Research*. 2018;28(6):257–266. URL: https://doi.org/10.1016/j.serj.2018.08.006
34. Jin S., Greaves D. Wave energy in the UK: Status review and future perspectives. *Renewable and Sustainable Energy Reviews*. 2021;143:110932.
35. Coffin M. National marine science plan 2015–2025: driving the development of Australia's blue economy. National Marine Science Committee; 2015.
36. Rotter A., Barbier M., Bertoni F., Bones A.M., Cancela M.L., Carlsson J., et al. The Essentials of Marine Biotechnology. *Frontiers in Marine Science*. 2021;8:629629. URL: https://doi.org/10.3389/fmars.2021.629629
37. Fu X.M., Zhang M.Q., Liu Y., Shao C.L., Hu Y., Wang X.Y., et al. Protective exploitation of marine bioresources in China. *Ocean and Coastal Management*. 2018;163:192–204. URL: https://doi.org/10.1016/j.ocecoaman.2018.06.018
38. Bourgougnon N., Burlot A.S., Jacquin A.G. Algae for global sustainability? In: *Advances in botanical research*. Elsevier; 2021:145–212.
39. Singh S., Bhat J.A., Shah S., Pala N.A. Coastal resource management and tourism development in Fiji Islands: a conservation challenge. *Environment, Development and Sustainability*. 2021;23(3):3009–3027. URL: https://doi.org/10.1007/s10668–020–00764–4
40. Wang W., Feng L., Zheng T., Liu Y. The sustainability of ecotourism stakeholders in ecologically fragile areas: Implications for cleaner production. *Journal of Cleaner Production*. 2021;279:123606.
41. Bateman S. Maritime piracy in the Indo-Pacific region — ship vulnerability issues. *Maritime Policy and Management*. 2010;37(7):737–751.
42. Lindley J. Criminal Threats Undermining Indo-Pacific Maritime Security: Can International Law Build Resilience? *Journal of Asian Economic Integration*. 2020;2(2):206–220. URL: https://doi.org/10.1177/2631684620940477
43. Hussain M.G., Failler P., Karim A.A., Alam M.K. Major opportunities of blue economy development in Bangladesh. *Journal of the Indian Ocean Region*. 2018;14(1):88–99. URL: https://doi.org/10.1080/19480881.2017.1368250
44. Niazi Z.A. Future of Maritime Security: Navigating Complex Waters in the Indo-Pacific. *Journal of Indo-Pacific Affairs*. 2024;7(2).
45. Oiwa T., Murashkin N. Institutional Mechanisms and Maritime Development Cooperation. In: India-Japan-ASEAN Triangularity. London: Routledge; 2022:91–119. URL: https://doi.org/10.4324/9781003216766–8
46. Voyer M., Allison E.H., Farmery A., Fabinyi M., Steenbergen D.J., van Putten I., et al. The role of voluntary commitments in realizing the promise of the Blue Economy. *Global Environmental Change*. 2021;71:102372.

47. Bari A. Our Oceans and the Blue Economy: Opportunities and Challenges. *Procedia Engineering*. 2017;194:5–11. URL: https://doi.org/10.1016/j.proeng.2017.08.109
48. Wenhai L., Cusack C., Baker M., Tao W., Mingbao C., Paige K., et al. Successful Blue Economy Examples With an Emphasis on International Perspectives. *Frontiers in Marine Science*. 2019;6:261. URL: https://doi.org/10.3389/fmars.2019.00261
49. Bax N., Novaglio C., Maxwell K.H., Meyers K., McCann J., Jennings S., et al. Ocean resource use: building the coastal blue economy. *Reviews in fish biology and fisheries*. 2021:1–19
50. Collins N. How Maritime Trade and the Indian Subcontinent Shaped the World: Ice Age to Mid-Eighth Century. How Maritime Trade and the Indian Subcontinent Shaped the World. 2022:1–320.
51. Recuero V.L. A preliminary assessment of the indicators for Sustainable Development Goal (SDG) 14 "Conserve and sustainably use the oceans, seas and marine resources for sustainable development". *Marine Policy*. 2018;98:47–57. URL: https://doi.org/10.1016/j.marpol.2018.08.036
52. Gómez S., Maynou F. Economic, sociocultural and ecological dimensions of fishing capacity in NW Mediterranean fisheries. *Ocean and Coastal Management*. 2020;197:105323. URL: https://doi.org/10.1016/j.ocecoaman.2020.105323
53. Natuva C.T. Fiji's Blue Economy and the importance of maritime security. *Roayl Australion Navy Sea Power Soundings*. 2021;23. URL: https://seapower.navy.gov.au/sites/default/files/documents/fijis_blue_economy_and_importance_maritime_security.pdf
54. Freestone D. The UN Process to Develop an International Legally Binding Instrument under the 1982 Law of the Sea Convention: Issues and Challenges. In: Conserving Biodiversity in Areas beyond National Jurisdiction. Brill Nijhoff; 2019:3–46. URL: https://doi.org/10.1163/9789004391703_002
55. Sarangi U. Blue economy, blue finance and ocean governance for achieving sustainable development goals. *Natural Resources Forum*. 2023;47(1):3–21. URL: https://doi.org/10.1111/1477–8947.12267
56. Dissanayake N., Withanawasam A., Sarjoon A. Conceptual nexuses between sustainable development and blue-green economy: An analysis of the importance of adopting blue-green economic principles in achieving sustainable development goals. C*ivilization*. 2021;12(6).
57. Nash K.L., Blythe J.L., Cvitanovic C., Fulton E.A., Halpern B.S., Milner-Gulland E.J., et al. To achieve a sustainable blue future, progress assessments must include interdependencies between the sustainable development goals. *One Earth*. 2020;2(2):161–173.
58. Lee K.H., Noh J., Khim J.S. The Blue Economy and the United Nations' sustainable development goals: Challenges and opportunities. *Environment International*. 2020;137:105528.
59. Lubchenco J., Haugan P.M. Towards Ocean Equity. In: The Blue Compendium: From Knowledge to Action for a Sustainable Ocean Economy. Springer; 2023:485–521.
60. Osterblom H., Wabnitz C.C.C., Tladi D. Towards ocean equity. 2020.
61. Whisnant R., Vandeweerd V. Investing in the New Blue Economy: The Changing Role of International Development Organizations in Catalyzing Private Sector Investment in Support of Regional Strategic Action Programmes for the Sustainable Development of Coasts and Oceans. *Journal of Ocean and Coastal Economics*. 2019;6(1):8. URL: https://doi.org/10.15351/2373–8456.1116
62. Elsner P., Matthews N., Beardon G. Evaluation of the strategic positioning of IOC-UNESCO. August 2021. 2021.
63. Uddin M.M., Schneider P., Asif M.R.I., Rahman M.S., Mozumder M.M.H., others. Fishery-based ecotourism in developing countries can enhance the social-ecological resilience of coastal fishers — a case study of Bangladesh. *Water*. 2021;13(3):292.
64. Bank W. Fish to 2030 Prospects for Fisheries and Aquaculture World Bank Report Number 83177-GLB. *Washington, DC*. 2013.
65. Doussineau M., Gnamus A., Gomez J., Haarich S., Holstein F., others. Smart specialisation and blue biotechnology in Europe. Publications Office of the European Union Luxembourg; 2020.
66. Lee K.H., Noh J., Lee J., Khim J.S. Blue economy and the total environment: Mapping the interface. *Environment International*. 2021;157:106796. URL: https://doi.org/10.1016/j.envint.2021.106796
67. Hassan D., Karim S. International marine environmental law and policy. Routledge, Taylor and Francis Group; 2019.
68. Islam A., Hossain M.B., Mondal M.A.H., Ahmed M.T., Hossain M.A., Monir M.U., et al. Energy challenges for a clean environment: Bangladesh's experience. *Energy Reports*. 2021;7:3373–3389.

69. Ahmad H. Bangladesh coastal zone management status and future trends. *Journal of Coastal Zone Management*. 2019;22(1):1–7.
70. Bir J., Golder M. R., Al Zobayer M. F., Das K. K., Zaman S., Chowdhury L. M., et al. A review on blue economy in Bangladesh: prospects and challenges. *International Journal of Natural and Social Sciences*. 2020;7:21–29.
71. Sarker N. M. Bangladesh — China maritime security cooperation: A search for new opportunities under the Belt and Road Initiative. In: China and South Asia. Routledge India; 2021:157–172.
72. Failler P., Hussain M. G., Karim A. A. The future of the blue economy in Bangladesh. *BMJ Bangladesh Maritime Journal*. 2021;(23):15–29.
73. Gigauri I., Janjua L. R. Digital and sustainable products to achieve sustainable business goals along the path to industry 5.0. In: Digitalization, Sustainable Development, and Industry 5.0: An Organizational Model for Twin Transitions. Emerald Publishing Limited; 2023. p. 25–40. URL: https://doi.org/10.1108/978–1–83753–190–520231003
74. Wuwung L., Croft F., Benzaken D., Azmi K., Goodman C., Rambourg C., Voyer M. Global blue economy governance–A methodological approach to investigating blue economy implementation. *Frontiers in Marine Science*. 2022;9:1043881. URL: https://doi.org/10.3389/fmars.2022.1043881
75. Huck W. Goal 14 Conserve and Sustainably Use the Oceans, Seas and Marine Resources for Sustainable Development. Sustainable Development Goals: Article-by-Article Commentary. Nomos, CH Beck, Hart Publishing; 2022.
76. Guevara S., Julián I. P. Sustainable consumption and production: A crucial goal for sustainable development — Reflections on the Spanish SDG implementation report. *Journal of Sustainability Research*. 2019;1(2).
77. Islam M. N. Concepts, Tools, and Pillars of the Blue Economy: A Synthesis and Critical Review. *Global Blue Economy*. 2022;1–33.
78. Ehler C. N. Two decades of progress in Marine Spatial Planning. *Marine Policy*. 2021;132:104134.
79. Bennett N. J., Blythe J., White C. S., Campero C. Blue growth and blue justice: Ten risks and solutions for the ocean economy. *Marine Policy*. 2021;125:104387. URL: https://doi.org/10.1016/j.marpol.2020.104387
80. Basel B., Goby G., Johnson J. Community-based adaptation to climate change in villages of Western Province, Solomon Islands. *Marine Pollution Bulletin*. 2020;156:111266.
81. Gusenbauer M., Haddaway N. R. Which academic search systems are suitable for systematic reviews or meta-analyses? Evaluating retrieval qualities of Google Scholar, PubMed, and 26 other resources. *Research synthesis methods*. 2020;11(2):181–217.
82. Haldar S., Peddibhotla A., Bazaz A. Analysing intersections of justice with energy transitions in India — A systematic literature review. *Energy Research & Social Science*. 2023;98:103010. URL: https://doi.org/10.1016/j.erss.2023.103010
83. Lai J. W.M., Bower M. Evaluation of technology use in education: Findings from a critical analysis of systematic literature reviews. *Journal of Computer Assisted Learning*. 2020;36(3):241–259. URL: https://doi.org/10.1111/jcal.12412
84. Boyd C. E., McNevin A.A., Davis R. P. The contribution of fisheries and aquaculture to the global protein supply. *Food security*. 2022;14(3):805–827.
85. Ampah J. D., Yusuf A. A., Afrane S., Jin C., Liu H. Reviewing two decades of cleaner alternative marine fuels: Towards IMO's decarbonization of the maritime transport sector. *Journal of Cleaner Production*. 2021;320:128871.
86. Tirumala R. D., Tiwari P. Innovative financing mechanism for blue economy projects. *Marine Policy*. 2022;139:104194.
87. Voyer M., Farmery A. K., Kajlich L., Vachette A., Quirk G. Assessing policy coherence and coordination in the sustainable development of a Blue Economy. A case study from Timor Leste. *Ocean and Coastal Management*. 2020;192:105187. URL: https://doi.org/10.1016/j.ocecoaman.2020.105187
88. Golgeci I., Makhmadshoev D., Demirbag M. Global value chains and the environmental sustainability of emerging market firms: a systematic review of literature and research agenda. *International Business Review*. 2021;30(5):101857.

89. Engle C., Guevara J. M.S. A proposal towards better sustainable consumer information to address eco-certification skepticism and sustainability initiatives of adventure tourism companies in Norway. Norwegian University of Life Sciences; 2022.
90. Voyer M., Quirk G., Farmery A.K., Kajlich L., Warner R. Launching a Blue Economy: crucial first steps in designing a contextually sensitive and coherent approach. *Journal of Environmental Policy and Planning*. 2021;23(3):345–362.
91. Mozumder M.M.H., Schneider P., Islam M.M., Deb D., Hasan M., Monzer M.A., et al. Climate change adaptation strategies for small-scale Hilsa fishers in the coastal area of Bangladesh: social, economic, and ecological perspectives. *Frontiers in Marine Science*. 2023;10:1151875.
92. Ubina N.A., Cheng S.C. A review of unmanned system technologies with its application to aquaculture farm monitoring and management. *Drones*. 2022;6(1):12.
93. Mahrad B.E., Newton A., Icely J.D., Kacimi I., Abalansa S., Snoussi M. Contribution of remote sensing technologies to a holistic coastal and marine environmental management framework: a review. *Remote Sensing*. 2020;12(14):2313.
94. Rotter A., Bacu A., Barbier M., Bertoni F., Bones A.M., Cancela M.L., et al. A new network for the advancement of marine biotechnology in Europe and beyond. *Frontiers in marine science*. 2020;7:278.
95. Hsu C.C., Quang-Thanh N., Chien F., Li L., Mohsin M. Evaluating green innovation and performance of financial development: mediating concerns of environmental regulation. *Environmental Science and Pollution Research*. 2021;28(40):57386–57397.
96. Johnson K., Masters I., Dalton G. *Building Industries at Sea-'Blue Growth'and the New Maritime Economy*. Taylor and Francis; 2018.
97. Kelly C., McAteer B., Fahy F., Carr L., Norton D., Farrell D., et al. Blue Growth: a transitions approach to developing sustainable pathways. *Journal of Ocean and Coastal Economics*. 2021;8(2):8.

ABOUT THE AUTHORS / ИНФОРМАЦИЯ ОБ АВТОРАХ

Tahsina Khan — Deputy Director (Research), Bangladesh University of Professionals (BUP), Dhaka, Bangladesh
Тахсина Хан — заместитель директора (по исследованиям), Бангладешский университет профессионалов (BUP), Дакка, Бангладеш
https://orcid.org/ 0000-0001-8032-3376
tahsina171@gmail.com

Md Mehedi Hasan Emon — Master of Business Administration and Independent Researcher, Bangladesh University of Professionals (BUP), Dhaka, Bangladesh
Мд Мехеди Хасан Эмон — магистр делового администрирования, и независимый исследователь, Бангладешский университет профессионалов (BUP), Дакка, Бангладеш
https://orcid.org/0000-0002-6224-9552
Corresponding Author
emonmd.mhasan@gmail.com

Conflicts of Interest Statement: The authors have no conflicts of interest to declare.

The article was submitted on 17.04.2024; revised on 25.05.2024 and accepted for publication on 03.06.2024. The authors read and approved the final version of the manuscript.

ORIGINAL PAPER

DOI: 10.26794/2308-944X-2024-12-2-74-87
UDC 33.021,37.012(045)
JEL I21, I25, I28

A Comparative Analysis of STEM Design Curriculum Policy for Country Development: A Case Study of Taiwan and Thailand

P. Lhakard
King Mongkut's University of Technology Thonburi, Bangkok, Thailand

ABSTRACT

The aim of this comparative study is to analyze the STEM (Science, Technology, Engineering, and Mathematics) design curriculum policies in Taiwan and Thailand, focusing on their potential impact on national development. The research examines three key areas: 1) STEM educational development policies; 2) curriculum frameworks; and 3) teacher professional development. **The methods** employed in this study include a comprehensive review of relevant literature, policy documents, and curriculum frameworks from both Taiwan and Thailand. The analysis involves a comparative approach to identify similarities, differences, and best practices in STEM education policies and implementation strategies. **The results** indicate that both Taiwan and Thailand recognize the importance of STEM education for driving innovation and economic growth. However, Taiwan demonstrates a more comprehensive STEM policy framework and a stronger commitment to developing a skilled workforce. Taiwan's curriculum framework emphasizes hands-on, project-based learning, interdisciplinary integration, and the incorporation of modern technologies, fostering critical thinking, problem-solving, and collaborative skills among students. In contrast, Thailand is in the early stages of establishing STEM regulations and aligning curricula with industry needs. Thailand's evolving curriculum framework shows promise in promoting creativity, critical thinking, and practical problem-solving abilities. Regarding teacher professional development, Taiwan has a well-established system of ongoing training and industry-school collaboration, while Thailand is in the process of creating a STEM teacher competency program. **The key conclusion** of this study is that Taiwan's well-developed STEM policy framework, with its focus on curriculum design and teacher professional development, demonstrates a more holistic approach to promoting STEM education compared to Thailand. Despite Thailand's early stage of implementation, the country is showing encouraging progress in aligning its STEM policies with national development goals. The findings suggest that a comprehensive and integrated approach to STEM education, encompassing policy development, curriculum design, and teacher professional development, is crucial for effectively promoting economic growth and innovation in both Taiwan and Thailand.

Keywords: STEM; science; technology; engineering; mathematics; education; educational development policy; Taiwan; Thailand; comparative analysis

For citation: **Lhakard P. A comparative analysis of STEM Design curriculum policy for country development: A case study of Taiwan and Thailand.** ***Review of Business and Economics Studies*****. 2024;12(2):74-87. DOI: 10.26794/2308-944X-2024-12-2-74-87**

ОРИГИНАЛЬНАЯ СТАТЬЯ

Сравнительный анализ политики разработки учебных программ STEM для развития страны: на примере Тайваня и Таиланда

П. Лхакард
Технологический университет короля Монгкута в Тонбури, Бангкок, Таиланд

АННОТАЦИЯ

Целью данного сравнительного исследования является анализ политики разработки учебных программ STEM (естественные науки, технология, инженерия и математика) в Тайване и Таиланде, уделяя особое внимание их потенциальному влиянию на национальное развитие. В исследовании рассматриваются три ключевые области: 1) политика развития STEM-образования; 2) структура учебных программ; 3) повышение квалификации учителей. Методы, использованные в этом исследовании, включают всесторонний обзор соответствующей литературы, политических и директивных документов и учебных программ Тайваня и Таиланда. Сравнительный анализ направлен на выявление сходства, различий и передового опыта в политике и стратегиях реализации STEM-образования. Результаты показывают, что как Тайвань, так и Таиланд признают важность STEM-образования для стимулирования инноваций и экономического роста. Однако Тайвань демонстрирует более комплексную политику STEM и более твердую приверженность развитию квалифицированной рабочей силы. В учебных программах Тайваня особое внимание уделяется практическому обучению, основанному на проектах, междисциплинарной интеграции, и внедрению современных технологий, что способствует развитию критического мышления, навыков решения проблем и совместной работы студентов. В отличие от этого, Таиланд находится на начальных этапах разработки правил STEM и приведения учебных программ в соответствие с потребностями экономики. Развивающаяся система учебных программ в Таиланде будет способствовать развитию творческого подхода, критического мышления и практических способностей решения проблем. Что касается повышения квалификации учителей, на Тайване существует налаженная система непрерывного обучения и сотрудничества между промышленностью и школой. В Таиланде данный процесс находится в стадии создания аналогичных программ. **Ключевой вывод** даного исследования заключается в том, что хорошо развитая политика STEM-образования на Тайване, в которой основное внимание уделяется разработке учебных программ и профессиональному развитию учителей, демонстрирует более целостный подход к продвижению STEM-образования по сравнению с Таиландом. Несмотря на начальную стадию внедрения в Таиланде, страна демонстрирует прогресс в согласовании своей политики STEM-образования с национальными целями развития. Результаты показывают, что комплексный и интегрированный подход к STEM-образованию, включающий разработку политики, создание учебных программ и повышение квалификации преподавателей, имеет решающее значение для эффективного содействия экономическому росту и инновациям как на Тайване, так и в Таиланде.

Ключевые слова: STEM; наука; технологии; инженерия; математика; образование; политика развития образования; Тайвань; Таиланд; сравнительный анализ

Для цитирования: **Lhakard P. A comparative analysis of STEM Design curriculum policy for country development: A case study of Taiwan and Thailand.** ***Review of Business and Economics Studies*****. 2024;12(2):74-87. DOI: 10.26794/2308-944X-2024-12-2-74-87**

1. Introduction

The rapid advancement of science and technology in the 21st century has made science, technology, engineering, and mathematics (STEM) education a crucial component of educational policies worldwide. Countries are increasingly recognizing the importance of fostering a skilled workforce in science, technology, engineering, and mathematics to drive innovation, economic growth, and global competitiveness. This comparative analysis examines the STEM design curriculum policies of Taiwan and Thailand, two Asian countries with contrasting experiences in STEM education implementation, to provide valuable insights into effective strategies and challenges faced in promoting STEM education.

Taiwan has consistently demonstrated its prowess in STEM fields, ranking among the top performers in international assessments such as the Programme for International Student Assessment (PISA) and the Trends in International Mathematics and Science Study (TIMSS) [1]. This success can

be attributed to Taiwan's comprehensive STEM curriculum policy, which emphasizes a holistic, interdisciplinary approach that seamlessly integrates science, technology, engineering, and mathematics through hands-on, project-based learning [2, 3]. By prioritizing the development of critical thinking, problem-solving, and collaboration skills, Taiwan's policy aims to equip students with the necessary competencies to thrive in a rapidly evolving technological landscape. Moreover, Taiwan's strong commitment to continuous teacher professional development ensures the effective implementation of its STEM curriculum, further contributing to its success [4, 5].

In contrast, Thailand has encountered significant challenges in implementing STEM education policies, despite recognizing its importance for driving innovation and economic growth. Thailand's diverse educational landscape and resource limitations have hindered progress in STEM education [6, 7]. While Thailand's STEM curriculum policy focuses on integrating STEM subjects into the existing curriculum, with an emphasis on practical applications and real-world problem-solving [8, 9], the lack of adequate funding and the need for extensive teacher training have impeded the full realization of these policy goals [10, 11]. Consequently, the implementation of STEM education in Thailand has been uneven, with disparities observed across different regions and socio-economic backgrounds [12, 13].

Despite the contrasting experiences of Taiwan and Thailand in STEM education, both countries share fundamental similarities in their recognition of the importance of integrating STEM subjects and promoting hands-on, project-based learning. However, there are notable differences in their policy approaches that merit further examination. Taiwan's policy strongly emphasizes interdisciplinary collaboration and the integration of STEM throughout the entire curriculum, reflecting a holistic and systemic approach to STEM education [5, 14]. In contrast, Thailand's policy focuses on integrating STEM into the existing curriculum, allowing for more flexibility in implementation but potentially limiting the depth of integration [15, 16]. These differences in policy approaches highlight the importance of considering the unique socio-economic, cultural, and educational contexts of each country when designing and implementing STEM education policies.

This comparative analysis aims to provide a nuanced understanding of the similarities and differences between Taiwan and Thailand's STEM education policies by examining the socio-economic effects, normative legal acts, and specific examples of STEM program applications in various educational contexts. By employing a mixed-methods approach that combines quantitative and qualitative data analysis, this study offers a comprehensive assessment of the strengths and weaknesses of each country's approach to STEM education. The findings of this study contribute to the growing body of literature on STEM education policies and provide valuable insights for policymakers, educators, and researchers seeking to enhance STEM education in their respective contexts.

As the global demand for STEM professionals continues to grow, investing in effective STEM education policies has become a critical imperative for countries seeking to maintain their competitive edge in the knowledge-based economy. By learning from the experiences of Taiwan and Thailand, policymakers and educators can develop evidence-based strategies to address the challenges and leverage the opportunities presented by STEM education. Ultimately, the success of STEM education policies will depend on the ability of countries to adapt and tailor their approaches to their specific contexts while fostering a culture of innovation, creativity, and lifelong learning.

2. Methodology

This study employs a qualitative research approach, specifically document analysis, to examine the STEM educational development policies in Taiwan and Thailand. The researchers carefully selected key policy documents, including government reports, educational guidelines, and curriculum frameworks, for analysis. These documents were chosen based on their relevance and significance in shaping the STEM education landscape in both countries.

3. Literature review

STEM education plays a crucial role in shaping a country's development by fostering innovation, critical thinking, and problem-solving skills among students. This literature review examines the policies and curriculum design strategies adopted by Taiwan and Thailand to promote

STEM education and their impact on national development. This review aims to analyze their work, compare their ideas, and explore the factors contributing to the success of their policies [17–19]. *Table 1* demonstrates definitions of STEM used by various organizations.

The policy framework in Taiwan focuses on enhancing teacher training programs, increasing collaboration between schools and industries, and promoting project-based learning. These initiatives have led to a significant increase in student engagement and achievement in STEM subjects. Furthermore, the government's commitment to funding research and development in STEM fields has contributed to Taiwan's position as a global leader in technology and innovation. In terms of design STEM curriculum, Taiwan highlighted the significance of incorporating design thinking and creativity into STEM education. By integrating design elements into the curriculum, students are encouraged to think critically, solve problems, and develop innovative solutions [5]. This approach has been widely adopted in Taiwan, leading to the cultivation of a new generation of students who possess both technical and creative skills [5]. The integration of design curriculum policies has contributed to the development of Taiwan's design industry and its reputation as a hub for innovation [5].

Yamkasikorn (2021) [22] examined the STEM education policies in Thailand and their impact on the country's development and emphasized the need for a comprehensive approach that includes teacher training, curriculum reform, and public-private partnerships to promote STEM education. His research revealed that the Thai government's investment in STEM education has led to an increase in student enrollment in STEM-related fields and an improved quality of education in science and technology [22]. The integration of design curriculum policies in Thailand's STEM education highlighted the importance of design thinking, problem-solving, and creativity in nurturing students' innovation skills [22]. By incorporating design curriculum policies, Thailand aims to develop a workforce capable of driving the country's creative industries and enhancing its global competitiveness. The integration of design thinking in STEM education has also resulted in improved student engagement and motivation [22].

3.1. Curriculum Framework

In Taiwan, the curriculum framework for STEM education has been a subject of significant research and development. Ku and Lin [1] conducted a study on the status and trends of STEM education in Taiwan, highlighting the importance of integrating science, technology, engineering, and mathematics into the curriculum. They emphasized the efforts of the Technological and Vocational Education Research Center and the K-12 Education Administration in promoting STEM education in Taiwan. Additionally,

Table 1
Definitions of STEM from various organizations

Organization	Definition
National Science Foundation (NSF)	Science, Technology, Engineering, Mathematics
U.S. Department of Education (USDoE)	Focus on Science, Technology, Engineering, and Mathematics
The National Academy of Sciences (NAS)	Emphasis on Science, Technology, Engineering, and Mathematics
The National Science Teachers Association (NSTA)	Incorporates Science, Technology, Engineering, and Mathematics
The National Aeronautics and Space Administration (NASA)	Intersection of Science, Technology, Engineering, and Mathematics

Sources: Compiled by the author based on USDoE (The U.S. Department of Education (USDoE). Science, Technology, Engineering, and Math, including Computer Science [Internet]. Washington, DC: USDoE; 2023. URL: https://www.ed.gov/stem), NAS (National Academy of Sciences. Integration in K-12 STEM Education in the United States: A Discussion. Washington, DC: National Academies Press; 2023. URL: https://www.nae.edu/113355/Integration-in-K12-STEM-Education-in-the-United-States-A-Discussion), [10, 20, 21].

Fan, Yu, and Lin [18] proposed a framework for implementing an engineering-focused STEM curriculum, which serves as a valuable reference for technology and engineering educators in designing and implementing engineering-oriented STEM curricula. This framework has played a crucial role in guiding the development of STEM education in Taiwan, especially concerning engineering-focused curricula [18].

In Thailand, the curriculum framework for STEM education has also received significant attention. The Ministry of Education in Thailand has placed a strong emphasis on STEM education to prepare students for the demands of the 21st century [6]. Sutaphan and Yuenyong [8] conducted research on the development of the Thailand STEM education framework, highlighting the integration of science, technology, engineering, and mathematics in the curriculum. They emphasized the importance of inquiry-based learning and the development of critical thinking skills in STEM education. Furthermore, Suriyabutr and Williams [3] discussed the challenges and opportunities of implementing STEM education in Thailand, emphasizing the need for collaboration between schools, universities, and industries to create an effective STEM curriculum. These scholars have contributed to the development and implementation of STEM education in Thailand, focusing on inquiry-based learning and collaboration within the education system and with external stakeholders.

3.2. Teacher professional development

In Taiwan, there has been a significant emphasis on in-service teacher professional development in STEM education. The government has actively promoted the integration of science, technology, engineering, and mathematics in the curriculum, leading to a demand for proficient STEM teachers [23]. To address this need, integrated STEM teacher professional development programs have been developed to equip educators with the necessary knowledge and skills [23]. These programs aim to enhance teachers' understanding of STEM concepts, pedagogical approaches, and assessment strategies, thereby enabling them to effectively implement STEM education in their classrooms [23]. A study conducted by Lin, Chien, and Chang [23] revealed that these professional development programs have had a positive impact on teachers' perceptions and practices. Teachers reported increased confidence in teaching STEM subjects, improved content knowledge, and enhanced pedagogical skills [23]. They also highlighted the importance of collaboration and networking opportunities provided by these programs, which enabled them to share ideas and experiences with their peers [23]. Moreover, the study emphasized the need for continuous professional development to ensure that teachers stay updated with the latest advancements in STEM education [23, 24].

Thailand, like Taiwan, recognizes the significance of teacher professional development in STEM education. A study by Fakcharoenphol, Dahsah, and Wannagatesiri [25] emphasized the role of professional development in fostering teacher effectiveness and student learning outcomes in Thailand's STEM classrooms. The study highlighted the need for focused professional development initiatives that address the specific challenges faced by teachers in implementing STEM education [25]. It also emphasized the importance of integrating technology and hands-on activities in professional development programs to enhance teachers' pedagogical skills and content knowledge [25]. Another study by Faikhamta, Lertdechapat, and Prasoblarb [26] investigated the impact of a professional development program on Thai science teachers' practices and perceptions. The findings indicated that the program positively influenced teachers' teaching practices, leading to improved student engagement and learning outcomes [26]. The study further emphasized the need for ongoing support and collaboration among teachers to sustain the positive changes observed in their classrooms [26].

4. Findings

4.1. Overview of STEM educational development policies

Taiwan's STEM education policy, as established by the government, aims to cultivate future professionals with interdisciplinary knowledge and skills [2, 5]. The policy emphasizes the integration of STEM subjects across disciplines, encouraging students to develop a holistic understanding of science and technology [2]. According to Lin et al. [14], this approach helps students appreciate the interconnectedness of STEM fields and promotes a multidisciplinary approach to

problem-solving. The government also actively promotes partnerships between academia, industry, and government agencies to ensure that STEM education aligns with industry needs [5]. This collaboration facilitates the development of relevant and up-to-date curricula that equip students with the necessary skills for the workforce [5].

On the other hand, Thailand's STEM education policy focuses on improving the quality and accessibility of STEM education [6, 27]. The government aims to enhance students' critical thinking, problem-solving, and innovation abilities through hands-on learning experiences [6, 26]. This approach is in line with the constructivist learning theory, which emphasizes active learning and student engagement [18]. The policy also emphasizes the importance of teacher training and professional development to ensure that educators are equipped with the necessary knowledge and skills to deliver effective STEM instruction [11, 28].

Both countries recognize the need to foster students' interest and engagement in STEM subjects from an early age. Taiwan's policy encourages the implementation of inquiry-based learning approaches to promote student curiosity and exploration [29]. Thailand, on the other hand, emphasizes the integration of STEM into the curriculum at all education levels, including primary and secondary schools [30].

4.2. Overview of STEM curriculum frameworks

Taiwan's STEM curriculum framework places a strong emphasis on project-based learning, hands-on activities, and design thinking [2, 5]. This approach encourages students to actively engage in the learning process by exploring real-world problems and developing practical solutions. According to Rasyid, Rinto, and Susanti [24], this curriculum framework promotes a student-centered approach where students take ownership of their learning and become active participants in problem-solving. It also fosters collaboration among students, as they work together in teams to tackle complex challenges [31, 32].

On the other hand, Thailand's STEM curriculum framework adopts an inquiry-based approach, integrating STEM subjects and highlighting cross-disciplinary connections [6]. According to Baharin, Kamarudin, and Manaf [32], this framework aims to cultivate students' curiosity, creativity, and scientific thinking. It encourages students to ask questions, investigate phenomena, and develop critical thinking skills [10]. Through this approach, students are not only exposed to the knowledge and skills within individual STEM subjects but also learn to apply these concepts in a holistic manner [12].

Both countries' STEM curriculum frameworks share the common goal of nurturing students' creativity and problem-solving abilities. They recognize the importance of developing students' skills beyond subject-specific knowledge, as highlighted by Tseng et al. [29]. In Taiwan, this is achieved through design thinking and hands-on activities [5], while in Thailand, it is accomplished through inquiry-based learning and cross-disciplinary connections [6].

4.3. Teacher professional development

In Taiwan, the government places great importance on continuous professional development for STEM teachers. They provide various training programs, workshops, and resources to enhance the pedagogical skills and content knowledge of teachers in these subjects [4, 14]. This commitment to ongoing development ensures that teachers stay up-to-date with the latest teaching methodologies and advances in STEM fields. Additionally, Buechel[1] found that teachers who participate in these professional development programs reported increased confidence in their ability to teach STEM subjects effectively.

On the other hand, Thailand focuses on equipping STEM teachers with the necessary skills and competencies through training programs and professional development initiatives [33]. The government encourages collaboration between teachers and industry experts to enrich teaching practices and expose students to real-world applications of STEM knowledge [33]. This collaborative approach has been found to enhance teachers' understanding of STEM concepts and improve their instructional strategies [33]. According to Suebsing and Nuangchalerm [11], these initiatives have also led to increased student interest and engagement in STEM subjects.

[1] Buechel C. An investigation of the effects of self-efficacy on STEM implementation [dissertation]. Arkansas: University of Arkansas; 2021.

Overall, both Taiwan and Thailand recognize the importance of teacher professional development in advancing STEM education. By investing in the continuous improvement of teachers' skills and knowledge, these countries are ensuring that their educators are well-equipped to deliver high-quality STEM instruction [13, 15, 19, 33]. This, in turn, contributes to the development of a skilled and innovative workforce for the future [4, 22].

Table 2 provides comparison of STEM education policies, curriculum frameworks, and teacher professional development between Taiwan and Thailand.

The STEM education in both Taiwan and Thailand can be attributed to various factors, including inquiry-based learning, teacher professional development, collaboration between industry and academia, and supportive curriculum policies. It is evident that both Taiwan and Thailand have made significant strides in promoting STEM education, and their experiences serve as valuable examples for countries aiming to enhance STEM education within their own educational systems.

5. Discussion

5.1. STEM educational development policies overview

In analyzing the STEM educational development policies in Taiwan and Thailand, it is evident that both countries recognize the importance of STEM education for fostering innovation and driving economic success. Taiwan stands out with a more extensive and comprehensive STEM policy framework, which reflects its commitment to developing a competent and skilled workforce. This can be attributed to its long-standing emphasis on science and technology education, supported by various normative legal acts that regulate the introduction of STEM programs in the educational process [34].

On the other hand, Thailand is still in the early stages of establishing STEM regulations that align with industrial demands. As noted by Pasupa [12], Thailand recognizes the importance of STEM education for its national development goals. The government has initiated efforts to connect curricula with industry demands, but the framework is still being developed. It is crucial

Table 2

Comparison of STEM education policies, curriculum frameworks, and teacher professional development between Taiwan and Thailand

Topics	Taiwan	Thailand
Overview of STEM Educational Development Policies	Taiwan's STEM education policy aims to cultivate future professionals with interdisciplinary knowledge and skills. The government emphasizes integration across disciplines and promotes partnerships between academia, industry, and government.	Thailand's STEM education policy focuses on improving the quality and accessibility of STEM education. The government aims to enhance students' critical thinking, problem-solving, and innovation abilities through hands-on learning experiences.
Curriculum Framework	Taiwan's STEM curriculum framework emphasizes project-based learning, hands-on activities, and design thinking. It encourages students to explore real-world problems and develop practical solutions through collaboration and creativity.	Thailand's STEM curriculum framework promotes an inquiry-based approach, integrating STEM subjects and emphasizing cross-disciplinary connections. It aims to foster students' curiosity, creativity, and scientific thinking.
Teacher Professional Development	Taiwan emphasizes continuous professional development for STEM teachers, offering training programs, workshops, and resources to enhance their pedagogical skills and content knowledge	Thailand focuses on equipping STEM teachers with the necessary skills and competencies through training programs and professional development initiatives. The government encourages collaboration between teachers and industry experts to enrich teaching practices

Source: Developed by the author.

to consider the specific normative legal acts that form the norms for introducing STEM programs in Thailand's educational process to ensure a solid foundation for implementation.

Moreover, it is essential to highlight the socio-economic effects of STEM curricula applied in practice. Successful STEM programs can lead to increased innovation, technological advancements, and a more skilled workforce, contributing to overall economic growth [35]. Providing concrete examples of the socio-economic impact of STEM education in both Taiwan and Thailand would strengthen the argument for their importance in national development.

5.2. Curriculum framework

Taiwan's curriculum framework for STEM education stands out for its emphasis on hands-on, project-based learning, integrative disciplines, and the use of modern technology. This approach is aligned with the recommendations of scholars such as Lou et al. [2], who argue that a project-based learning approach enhances students' engagement and critical thinking skills. Taiwan's curriculum framework also promotes the integration of different disciplines, enabling students to make connections between science, technology, engineering, and mathematics.

It would be beneficial to provide examples of STEM program applications in relation to specific educational directions, levels of education, and their peculiarities. For instance, STEM programs can be applied not only in design and engineering but also in fields such as economics, where data analysis, mathematical modeling, and technological tools are increasingly important [5]. Highlighting the versatility of STEM education across various disciplines and educational levels would showcase its broad applicability and relevance.

In Thailand, the curriculum framework for STEM education is still being established. However, it shows promising potential for fostering creativity, critical thinking, and problem-solving skills among students. As suggested by Soros, Ponkham, and Ekkapim [27], integrating creative and critical thinking skills into the curriculum can enhance students' abilities to solve complex problems. Thailand's evolving curriculum framework indicates the country's intention to align STEM education with the development of these crucial skills.

5.3. Teacher professional development

In terms of teacher professional development, Taiwan has a well-established system that emphasizes ongoing training and industry-school collaboration. Scholars such as Lee, Hsu, and Chang [33] highlight the importance of continuous professional development for STEM teachers to stay updated with advancements in their respective fields. Taiwan's commitment to teacher training ensures that educators have the necessary knowledge and skills to effectively deliver STEM education.

Similarly, Thailand recognizes the significance of teacher development in promoting STEM education. The country is in the process of creating STEM teacher competency programs to enhance teachers' capacity in delivering STEM content. According to Maitreepan and Thamatasenahant [31], providing teachers with professional development opportunities can positively impact their instructional practices and student outcomes. Thailand's focus on teacher development aligns with the broader goal of strengthening STEM education in the country.

When comparing the experiences of Taiwan and Thailand in the field of STEM education, it would be beneficial to highlight both quantitative and qualitative characteristics. Providing statistical data on the number of STEM programs, student enrollment, and graduate employment rates in STEM fields would support the conclusions drawn from the analysis [16]. Additionally, qualitative data, such as student and teacher feedback on STEM programs, could offer valuable insights into the effectiveness and impact of these initiatives.

Therefore, the comparative analysis of STEM educational development policies, curriculum frameworks, and teacher professional development in Taiwan and Thailand reveals notable similarities and differences. Taiwan's well-established policy framework, comprehensive curriculum, and emphasis on teacher professional development demonstrate a strong commitment to promoting STEM education. Thailand, while still in the early stages of policy implementation and curriculum development, shows promising signs of aligning its policies with development goals. Both countries can learn from each other's experiences and collaborate to further enhance STEM education, taking into account the normative legal acts, socio-economic effects, diverse applications, and

both quantitative and qualitative characteristics of STEM programs.

6. Implications

This research highlights the potential implications of STEM design curriculum policies on country development. By examining the strengths and weaknesses of each country's approach, policymakers, educators, and researchers can gain insights into effective strategies for enhancing STEM education. Lessons learned from Taiwan and Thailand can inform future policy decisions and help countries tailor their STEM education initiatives to their specific contexts.

6.1. Designing curriculum policies for STEM education

The design of curriculum policies in Taiwan has been instrumental in supporting the success of STEM education. According to Sungur Gül et al. [28], the integration of STEM into the national curriculum framework has ensured that STEM subjects are given equal importance as other core subjects. This integration has been achieved through the development of interdisciplinary teaching materials and the provision of specialized training for teachers. Furthermore, the establishment of STEM resource centers across the country has provided teachers with access to updated teaching resources and educational technology tools [1]. The curriculum policies in Taiwan also prioritize the cultivation of students' interest and motivation in STEM by incorporating project-based learning and extracurricular activities [3]. These policies have created a supportive ecosystem for STEM education, allowing students to develop a deep interest in these subjects from an early age.

In Thailand, scholars have identified several factors contributing to the success of STEM education. The Thai government's support for STEM initiatives, such as the establishment of STEM schools and the allocation of resources for teacher professional development, has been crucial in fostering a culture of STEM education. Moreover, the collaboration between schools and industries has provided students with opportunities to apply their knowledge in real-world contexts [29]. This collaboration has helped bridge the gap between theoretical knowledge and practical skills, enhancing the relevance of STEM education in Thailand. The curriculum policies in Thailand have been designed to support effective STEM education. According to Wannapiroon et al. [9], the integration of STEM into the national curriculum has been a significant step towards ensuring the comprehensive development of students' STEM competencies. The curriculum emphasizes hands-on activities, problem-solving, and critical thinking skills. Additionally, the Thai government has invested in providing schools with STEM resources and infrastructure to facilitate the implementation of STEM education [30]. The promotion of STEM-related extracurricular activities and competitions.

In this research, the researcher has analyzed the strengths and weaknesses as guidelines for making policies and curricula learned from both countries, with details below as follows.

Research highlights the potential implications of STEM design curriculum policies on country development. By examining the strengths and weaknesses of each country's approach, policymakers, educators, and researchers can gain insights into effective strategies for enhancing STEM education. Lessons learned from Taiwan and Thailand can inform future policy decisions and help countries tailor their STEM education initiatives to their specific contexts. The details are demonstrated in *Table 3*.

By examining these strengths and weaknesses, policymakers, educators, and researchers can gain valuable insights into effective strategies for enhancing STEM education. These lessons learned from Taiwan and Thailand can inform future policy decisions and help countries tailor their approaches to meet the unique needs of their education systems.

7. Conclusion

The comparative analysis of Taiwan and Thailand's STEM design curriculum policies reveals both similarities and differences. Both countries recognize the importance of STEM education in driving national development. However, their approaches to curriculum design, teaching methods, and teacher professional development differ. Taiwan emphasizes interdisciplinary integration, project-based learning, and industry partnerships, while Thailand focuses on inquiry-based learning and collaboration.

In Taiwan, STEM education has been recognized as a crucial component of the country's

Table 3
Classification of academic content for STEM curriculum

Topics	Taiwan		Thailand	
	Strength	**Weakness**	**Strength**	**Weakness**
1. Curriculum Design	Taiwan's STEM curriculum is well-structured and focuses on fostering critical thinking, problem-solving, and creativity.	There is limited flexibility within the curriculum to adapt to changing technological advancements.	Thailand's STEM curriculum emphasizes hands-on learning experiences and integrates real-world applications of scientific concepts.	The curriculum lacks a clear progression of skills and may not adequately prepare students for higher-level STEM education.
2. Teacher Training and Professional Development	Teachers in Taiwan undergo rigorous training and professional development programs to enhance their STEM teaching skills.	The training programs do not always provide teachers with the necessary resources and support to implement innovative teaching methods effectively.	Thailand has made efforts to improve teacher training programs and provide ongoing professional development opportunities for STEM educators.	The training programs may not consistently meet the needs of all teachers, resulting in varying levels of STEM proficiency among educators.
3. Infrastructure and Resources	Taiwan has well-equipped STEM laboratories and classrooms with modern technology and resources to support hands-on learning.	The availability of these resources may be limited, particularly in rural areas, leading to unequal access to STEM education.	Thailand has made significant investments in improving infrastructure and providing resources for STEM education, especially in urban areas.	The availability and quality of infrastructure and resources may vary across schools, leading to disparities in STEM education opportunities.
4. Industry Collaboration	Taiwan has strong partnerships between educational institutions and industry, allowing students to engage in real-world projects and internships.	The extent of industry collaboration may vary across different regions, limiting equal opportunities for students.	Thailand has been fostering collaborations between schools, universities, and industries to bridge the gap between education and employment.	The level of industry involvement in STEM education initiatives may not be consistent across the country.
5. Student Engagement and Enrichment	Taiwan encourages student participation in STEM competitions, clubs, and extracurricular activities, fostering a passion for STEM subjects	The emphasis on competition may create high levels of stress and pressure among students.	Thailand promotes STEM enrichment programs, science camps, and clubs to engage students and enhance their interest in STEM fields.	The availability and accessibility of these enrichment programs may be limited, particularly in rural areas.

Table 3 *(continued)*

Topics	Taiwan		Thailand	
	Strength	**Weakness**	**Strength**	**Weakness**
6. Research and Development:	Taiwan has a strong focus on research and development in STEM fields, leading to technological advancements and innovation.	There may be a gap between research findings and their practical implementation in the education system.	Thailand has been investing in research and development in STEM fields, fostering innovation and scientific discoveries.	The translation of research findings into practical applications within the education system may be limited.
7. Government Support and Policy	Taiwan's government has consistently shown strong support for STEM education, implementing policies and initiatives to enhance its quality and accessibility	The implementation of policies and initiatives may face challenges due to bureaucratic processes and limited resources	Thailand's government has recognized the importance of STEM education and has introduced policies and initiatives to promote its development	The coordination and effectiveness of policy implementation across different regions may vary, affecting the overall impact of these initiatives

Source: Developed by the author.

national development strategy. The government has implemented comprehensive policies and initiatives to foster STEM learning from the early years of education. One of the key policies in Taiwan is the inclusion of STEM design curriculum in primary and secondary schools. The curriculum aims to develop students' problem-solving skills, critical thinking abilities, and creativity through hands-on and project-based learning activities. The curriculum is designed to integrate science, technology, engineering, and mathematics concepts and principles into real-world applications.

To ensure the effective implementation of the STEM design curriculum, the Taiwanese government has provided professional development opportunities for teachers, including training programs, workshops, and resources. These initiatives aim to equip teachers with the necessary knowledge and skills to effectively engage students in STEM learning. Additionally, Taiwan has established partnerships with industry and academia to bridge the gap between education and the workforce. These collaborations provide students with opportunities to engage in real-world projects and gain practical experience in STEM fields.

On the other hand, Thailand has also recognized the importance of STEM education in its development agenda. The Thai government has implemented policies to enhance the quality of education and promote STEM learning in schools. However, the approach to STEM education in Thailand differs from that of Taiwan. In Thailand, the focus is on the integration of STEM subjects into the existing curriculum rather than a separate STEM design curriculum. The integration aims to promote interdisciplinary learning and the application of STEM principles in various subjects.

Thailand's curriculum reforms emphasize the development of inquiry-based learning approaches, critical thinking, and problem-solving skills across all subjects, including science, mathematics, technology, and engineering. The integration of STEM subjects is seen to enhance students' understanding of these subjects and their relevance to real-world contexts. The Thai government has also emphasized the importance of providing teachers with professional development opportunities to effectively deliver STEM education in the classroom.

While Taiwan and Thailand have taken different approaches to STEM education, both countries share common goals of fostering innovation, technological advancement, and economic growth. The policies and initiatives implemented in both countries aim to equip students with the necessary knowledge, skills, and competencies to thrive in the 21st-century workforce. By comparing the STEM design curriculum policies in Taiwan and Thailand, we can gain insights into the different approaches to STEM education and identify best practices that can be applied in other contexts.

REFERENCES

1. Ku C.J., Lin K.Y. Status and Trends of STEM Education in Highly Competitive Countries: Country Reports and International Comparison. Technological and Vocational Education Research Center. 2022:361–402. Wu-Nam Book Inc.
2. Lou S.J., Shih R.C., Ray Diez C., Tseng K.H. The impact of problem-based learning strategies on STEM knowledge integration and attitudes: an exploratory study among female Taiwanese senior high school students. *International Journal of Technology and Design Education.* 2011;21:195–215. URL: https://doi.org/10.1007/s10798–010–9114–8
3. Suriyabutr A., Williams J. Integrated STEM education in the Thai secondary schools: challenge and addressing of challenges. *Journal of Physics: Conference Series.* 2021;1957(1):1–9. DOI: 10.1088/1742–6596/1957/1/012025
4. Ku C.J., Lin K.Y. Technology teacher education in Taiwan. In: International technology teacher education in the Asia-pacific region. 2020:263–308.
5. Yang C.L., Yang Y.C., Chou T.A., Wei H.Y., Chen C.Y., Kuo C.H. Case study: Taiwanese government policy, STEM education, and industrial revolution 4.0. In: STEM in the Technopolis: The power of STEM education in regional technology policy. 2020:149–170. URL: https://doi.org/10.1007/978–3–030–39851–4_9
6. Promboon S., Finley F.N., Kaweekijmanee K. The evolution and current status of STEM education in Thailand: Policy directions and recommendations. In: Education in Thailand: An old elephant in search of a new mahout. 2018:423–459. URL: https://doi.org/10.1007/978–981–10–7857–6_17
7. Surakarn A., Junprasert T., Chaiakkarakan N., Peungposop N., Boonlop R. Active learning and its outcomes: A case study from the education reform project in Thailand. *The Journal of Behavioral Science.* 2020;15(1):34–51. URL: https://so06.tci-thaijo.org/index.php/IJBS/article/view/143725
8. Sutaphan S., Yuenyong C. STEM education teaching approach: Inquiry from the context based. *Journal of Physics: Conference Series.* 2019;1340(1):1–18. DOI: 10.1088/1742–6596/1340/1/012003
9. Wannapiroon P., Nilsook P., Techakosit S., Kamkhuntod S. STEM Literacy of Students in Vocational Education. *International Journal of Technology in Education and Science*. 2021;5(4):527–549. URL: https://doi.org/10.46328/ijtes.253
10. Daugherty M.K. The Prospect of an "A" in STEM Education. *Journal of STEM Education: Innovations and Research*. 2013;14(2):10–15. URL: https://www.jstem.org/jstem/index.php/JSTEM/article/view/1744
11. Suebsing S., Nuangchalerm P. Understanding and satisfaction towards STEM education of primary school teachers through professional development program. *Jurnal Pendidikan IPA Indonesia*. 2021;10(2):171–177. DOI: 10.15294/jpii.v10i2.25369
12. Pasupa S. Sustainable development in Thailand supported by industrial design education. Loughborough: Loughborough University; 2016. URL: https://hdl.handle.net/2134/23707
13. Sritrakul P. The state of STEM education policy in Northern Region, Thailand. *Humanities, Arts and Social Sciences Studies*. 2018:129–147. URL: https://doi.org/10.14456/hasss.2018.11
14. Lin C., Huang J., Lin R. From STEAM to CHEER: A case study of design education development in Taiwan. *Education Sciences.* 2021;11(4):171. URL: https://doi.org/10.3390/educsci11040171
15. Fakcharoenphol W., Dahsah C., Wannagatesiri T. Teacher Professional Development and Education for STEM Teaching in Thailand: Challenges and Recommendations. In: Concepts and Practices of STEM Education in Asia. Singapore: Springer Nature Singapore; 2022:253–270. URL: https://doi.org/10.1007/978–981–19–2596–2_14
16. Wu P.H., Kuo C.Y., Wu H.K., Jen T.H., Hsu Y.S. Learning benefits of secondary school students' inquiry-related curiosity: A cross-grade comparison of the relationships among learning experiences, curiosity, engagement, and inquiry abilities. *Science Education.* 2018;102(5):917–950. URL: https://doi.org/10.1002/sce.21456

17. Asghar A., Ellington R., Rice E., Johnson F., Prime G. M. Supporting STEM education in secondary science contexts. *Interdisciplinary Journal of Problem-Based Learning.* 2012;6(2):85–125. URL: https://doi.org/10.7771/1541–5015.1349
18. Fan S. C., Yu K. C., Lin K. Y. A framework for implementing an engineering-focused STEM curriculum. *International Journal of Science and Mathematics Education.* 2021;19:1523–1541. URL: https://doi.org/10.1007/s10763–020–10129-y
19. Kijkuakul S. Professional changes of primary science teachers: experience on collaborative action research in Thailand. *Asia-Pacific Science Education.* 2019;5(1):1–22. URL: https://doi.org/10.1186/s41029–019–0030–2
20. Granovskiy B. Science, Technology, Engineering, and Mathematics (STEM) Education: An Overview. CRS Report R 45223, Version 4. Updated. *Congressional Research Service*. 2018. URL: https://sgp.fas.org/crs/misc/R 45223.pdf
21. Johnson H., Cotterman M. Collaborative efforts to put the 'E'back in STEM. *NSTA Reports.* 2013;25(4):3. URL: http://www.nsta.org/docs/NSTAReportsNov13EntireIssueFinal.pdf
22. Yamkasikorn M. STEM Education and Innovation for Teacher Development: New Challenges toward Thai Education Quality. *Asia Research Network Journal of Education.* 2021;1(1):32–42. URL: https://so05.tci-thaijo.org/index.php/arnje/article/view/250673
23. Lin P. L., Chien Y. T., Chang C. Y. Teachers' responses to an integrated STEM module: Collaborative curriculum design in Taiwan, Thailand, and Vietnam. In: Integrated Approaches to STEM Education: An International Perspective. 2020:491–509. URL: https://doi.org/10.1007/978–3–030–52229–2_26
24. Rasyid A., Rinto R., Susanti M. Project-based learning through the STEM approach in elementary schools: How to improve problem-solving ability. *Journal of Education for Sustainable Innovation.* 2023;1(1):1–8. URL: https://doi.org/10.56916/jesi.v1i1.477
25. Shernoff D. J., Sinha S., Bressler D. M., Ginsburg L. Assessing teacher education and professional development needs for the implementation of integrated approaches to STEM education. *International Journal of STEM Education.* 2017;4:1–16. URL: https://doi.org/10.1186/s40594–017–0068–1
26. Faikhamta C., Lertdechapat K., Prasoblarb T. The Impact of a PCK-based Professional Development Program on Science Teachers' Ability to Teaching STEM. *Journal of Science and Mathematics Education in Southeast Asia.* 2020;43.
27. Soros P., Ponkham K., Ekkapim S. The results of STEM education methods for enhancing critical thinking and problem-solving skill in physics the 10th grade level. AIP Conference Proceedings. 2018;1923(1). URL: https://doi.org/10.1063/1.5019536
28. Sungur Gül K., Saylan Kirmizigül A., Ates H., Garzón J. Advantages and Challenges of STEM Education in K-12: Systematic Review and Research Synthesis. *International Journal of Research in Education and Science.* 2023;9(2):283–307. URL: https://doi.org/10.46328/ijres.3127
29. Tseng K. H., Chang C. C., Lou S. J., Chen W. P. Attitudes towards science, technology, engineering and mathematics (STEM) in a project-based learning (PjBL) environment. *International Journal of Technology and Design Education.* 2013;23:87–102. URL: https://doi.org/10.1007/s10798–011–9160-x
30. Norman G. R., Schmidt H. G. The psychological basis of problem-based learning: A review of the evidence. *Academic medicine*. 1992;67(9):557–65.
31. Maitreepan L., Thamatasenahant S. The Enhancing Teacher Competency Program for Learning Management of STEM Education under the Mahasarakham Primary Educational Service Area Office 1. *Journal of Buddhist Philosophy Evolved*. 2021;5(2):35–47. URL: http://202.28.34.124/dspace/handle123456789/1151
32. Baharin N., Kamarudin N., Manaf U. K. A. Integrating STEM education approach in enhancing higher order thinking skills. *International Journal of Academic Research in Business and Social Sciences.* 2018;8(7):810–821. URL: http://dx.doi.org/10.6007/IJARBSS/v8-i7/4421
33. Lee M. H., Hsu C. Y., Chang C. Y. Identifying Taiwanese teachers' perceived self-efficacy for science, technology, engineering, and mathematics (STEM) knowledge. *The Asia-Pacific Education Researcher.* 2019;28:15–23. URL: https://doi.org/10.1007/s40299–018–0401–6
34. Yodpet W. Policy and Practice to Engage STEM Education in Secondary Education: A Comparative Study between Taiwan and Thailand. *Journal of Comparative Education.* 2020;88:123–153. DOI: 10.3966/160957582020050088004

35. Lin K.Y., Yu K.C., Hsiao H.S., Chang Y.S., Chien Y.H. Effects of web-based versus classroom-based STEM learning environments on the development of collaborative problem-solving skills in junior high school students. *International Journal of Technology and Design Education.* 2020;30(1):21–34. URL: https://doi.org/10.1007/s10798–018–9488–6

ABOUT THE AUTHOR / ИНФОРМАЦИЯ ОБ АВТОРЕ

Polwasit Lhakard — Ph.D. International Doctoral Program in Asia-Pacific Studies (IDAS). International Master of Business Administration, Lecturer and Researcher, General Education Department, School of Liberal Arts, King Mongkut's University of Technology Thonburi, Bangkok, Thailand
Полвасит Лхакард — доктор философии Международной программы докторантуры по азиатско-тихоокеанским исследованиям (IDAS), международный магистр делового администрирования, преподаватель и научный сотрудник Факультета общего образования, Технологический университет короля Монгкута в Тонбури, Бангкок, Таиланд
https://orcid.org/0000-0002-3617-9044
polwasit.lhak@kmutt.ac.th

Conflicts of Interest Statement: The author has no conflicts of interest to declare.

The article was submitted on 22.05.2023; revised on 10.06.2024 and accepted for publication on 14.06.2024. The author read and approved the final version of the manuscript.

ORIGINAL PAPER

DOI: 10.26794/2308-944X-2024-12-2-88-96
UDC 330.144,330.354,339.7(045)
JEL O1, O2, F34, F35

External Financial Flows and Domestic Credit Volatility Effect on Industrialization in Selected African Countries

W. Bako
Plateau State University, Bokkos, Nigeria

ABSTRACT

Countries all over the world focus on industrialization as a foundation for rapid economic development and unemployment reduction. Without stable external and domestic finance, we cannot achieve this goal. Financial volatility has an impact on a country's industrialization process. The **aim** of this study is to determine how external and domestic credit volatility affect industrialization in Africa. **Data** for some selected countries for 1992–2020 was used. The author used the Prais-Winsten regression **method** with Panel Corrected Standard Errors (PCSE) to estimate and analyze the model. Descriptive and quantitative methods of analysis were also used to analyze the long-balanced panel data set for the 17 selected African countries with available data. The **results** showed a combination of positive and negative effects of financial volatility on industrialization in Africa. The study **concludes** that domestic credit volatility has adversely affected industrialization in Africa and recommends the development of financial institutions on the continent through recapitalization, skilled manpower development and innovative development of different financial instruments.

***Keywords**:* Africa; volatility; growth; financial flows; external finance; industrialization; foreign direct investment; remittances

For citation: **Bako W. External financial flows and domestic credit volatility effect on industrialization in selected African countries.** ***Review of Business and Economics Studies*****. 2024;12(2):88-96. DOI: 10.26794/2308-944X-2024-12-2-88-96**

ОРИГИНАЛЬНАЯ СТАТЬЯ

Влияние волатильности внешних финансовых потоков и внутреннего кредитования на индустриализацию в отдельных африканских странах

В. Бако
Университет штата Плато, Боккос, Нигерия

АННОТАЦИЯ

Все страны мира уделяют особое внимание индустриализации как основе быстрого экономического развития и сокращения безработицы. Без стабильного внешнего и внутреннего финансирования эта цель не может быть достигнута. Финансовая волатильность оказывает влияние на процесс индустриализации страны. **Целью** данного исследования является изучение влияния волатильности внешних инвестиций и внутреннего кредита на индустриализацию в Африке. Были задействованы **данные** по 17 странам Африки за 1992–2020 гг. Для оценки и анализа модели автор использовал регрессионный **метод** Прайса-Уинстена с панельными стандартными поправками. В работе также

применялись описательные и количественные методы анализа долгосрочного сбалансированного набора панельных данных по 17 выбранным африканским странам. **Результаты** показали сочетание положительного и отрицательного воздействия финансовой волатильности на индустриализацию в Африке. В исследовании делается **вывод**, что нестабильность внутреннего кредитования отрицательно повлияла на индустриализацию в Африке, и рекомендуется развивать финансовые учреждения на континенте посредством рекапитализации, развития квалифицированной рабочей силы и инновационного развития различных финансовых инструментов.
Ключевые слова: Африка; волатильность; экономический рост; финансовые потоки; внешнее финансирование; индустриализация; прямые зарубежные инвестиции; денежные переводы

Для цитирования: **Bako W. External financial flows and domestic credit volatility effect on industrialization in selected African countries.** ***Review of Business and Economics Studies*****. 2024;12(2):88-96. DOI: 10.26794/2308-944X-2024-12-2-88-96**

Introduction

Industrialization is crucial for economic development, poverty reduction and human capital development. It was fundamental to the rapid growth and transformation of Western nations, and this reality had been demonstrated in the changes taking place among Asian countries, especially those in the South East. A driver and facilitator of this fundamental transformation besides human capital development is the availability and use of capital, both domestic and external for the development and growth of industries. Agriculture's share in the continent's gross domestic product (GDP) in developing Asia declined from 31.9 percent in the 1970s to 8.5 percent in 2018. There was also a decrease in its share of employment for the same period, from 71 percent to 33.5 percent, while industry's share increased from 14.1 percent to 25.5 percent, which was more than twice sub-Saharan Africa's share of 11.4 percent.[1] Signifying the greater role of industrialization on the continent of Asia. Africa lags behind other regions of the world in terms of manufacturing and economic restructuring. Manufacturing share in employment for the World in 2021 was 13.6 percent, while Africa's share was 7.4 percent with sub-Saharan Africa's (SSA) share was 6.7 percent while North Africa's share was 11 percent. The shares of South America, Latin America and the Caribbean and Southeast Asia were 10.9, 12 and 15 percent, respectively.[2] Implying that Africa is lagging behind other regions of the world. It is therefore necessary that Africa change this narrative for the development of the continent.

Various industrialization policies have been implemented by countries in Africa over the years. These include state-led and import substitution industrialization strategies of the 1960s and 1970s, the structural adjustment policy programs (SAPs) of the 1980s, and the investment climate reforms of the 2000s. Despite all these approaches, Africa's share in the world's manufacturing value added was less than that of other developing countries. Africa's share in 2021 was 1.9 percent (which was its share in 1980), while for Latin America and the Caribbean it was 4.2 percent, and for Asia it was 54.1 percent.[3,4] There had been two resolutions adopted by the United Nations (UN) declaring decades of Africa's industrialization. In 2016, the third industrial development decade resolution for Africa (2016–2025) was adopted. It was aimed at promoting the industrial development of the continent that is sustainable and inclusive.[5] The African Union's Agenda 2063 provides for the transformation and industrialization of Africa as one of its priority objectives.

Africans constitute about 1.3 billion, or 17 percent, of the world population.[5] Despite this population size, the continent supplies only 3 percent of global GDP and 2 percent of global manufacturing value added (MVA). The world's MVA per capita is almost nine times that of Africa. The MVA growth rate for the world and Africa between 2012

[1] Asian Development Bank. Asia's Journey to Prosperity. 2020.
[2] UNIDO. International Yearbook of Industrial Statistics. 2023 edition.
[3] United Nations Industrial Development Organization (UNIDO). International Yearbook of Industrial Statistics: Edition 2022, Vienna: United Nations Industrial Development Organization.
[4] United Nations Economic Commission for Africa (UNECA) and African Union (AU). Dynamic Industrial Policy in Africa. Addis Ababa. United Nations Economic Commission for Africa. 2014.
[5] United Nations Industrial Development Organization (UNIDO). Competitive Industrial Performance Report. 2020, Vienna. United Nations Industrial Development Organization.

and 2019 was 2.1 and 0.7 percent, respectively, but the continent's MVA share in GDP increased from 10 to 10.6 percent, while the world's share increased from 16.1 to 16.5 percent within the same period.[6] This underscores the need for Africa to boost its industrialization process.

Finance is critical to boosting the industrialization process in Africa. Without adequate financing, achieving the desired level of industrialization will almost be impossible. Financing for industrialization is usually generated both from internal and external sources. Large investments in new factories and plants, alongside infrastructure, are necessary for rapid growth. In Asia, it was financed largely by domestic savings because the financial system in the region channeled these savings into investments. External financing, such as foreign direct investment, multilateral development bank funding, and remittances for overseas workers, played important roles in many countries.[7] This showed that rapid and effective industrialization requires both domestic and external funding. Africa has encountered the challenge of effectively financing industrial development. Domestic credit to the private sector as a percentage of GDP for sub-Saharan Africa was very low. Between 2000 and 2022, it was an average of 55.3 percent, while the world average in 2021 was 160.9 percent, which was more than twice that of SSA.[8] The use of domestic resources alone is inadequate to attain the status of an industrialized continent because of the skill, technology transfer, and other benefits associated with the inflow of external capital.

The Monterrey consensus of 2002 was on external financial flows for development, with a focus on foreign investment, external debt, official development assistance and exports. The heads of state(s) and governments identified and committed themselves to mobilizing both domestic and external financial resources for sustained long-term growth and development, poverty reduction, inclusive growth and an equitable global economic system.[9] Remittances have also become an additional source of external financial flow into countries, especially in Africa, Asia and Latin America. These are important sources of funding support for developing countries, especially Africa. The volatility of these external financial sources of funding could have positive or negative effects on Africa's industrialization drive. It can result in negative long-term growth, a reduction in consumption and investment, an unstable macroeconomic policy environment, weak institutions and a fall in the standard of living.

In terms of external debt, aggregate net financial inflow, debt and equity combined for low- and middle-income countries in 2019 was $ 0.9 billion, which was 15 percent lower than the comparable 2018 figure.[10] This was a period of growth on the African continent, driven by the prices of natural resources, declining conflicts in the region and high demand in China. The World Bank further stated that total external debt stock increased by 5.4 percent in 2019 to $ 8.1 trillion, with the fastest debt stock accumulation of 9.7 percent in sub-Saharan Africa (SSA), followed by South Asia with 7.6 percent. External debt stock in SSA increased between 2010 and 2019. It was $ 296 billion USD in 2010 and increased to $ 625 billion in 2019. This represents an increase of 111.14 percent between 2010 and 2019, thus showing some volatility. Gross National Income (GNI) per annum in the region increased on average by 3.2%, while debt increased by 9 percent for the same period.[11] This implied an increase in external debt stock for financing activities in the region.

External shocks such as the Lehman Brothers' collapse in 2010 and the fall in the prices of natural resources, especially crude oil, beginning from 2014 to 2016, led to recession in some countries, especially oil-dependent countries such as Nigeria. Also, the COVID-19 pandemic contributed significantly to African countries experiencing various degrees of uncertainty and volatility in financial flows, which adversely affected industrial value added on the continent. These series of external shocks, coupled with adverse climate

[6] United Nations Industrial Development Organization (UNIDO). International Yearbook of Industrial Statistics: Edition 2022, Vienna: United Nations Industrial Development Organization.

[7] Asian Development Bank. Asia's Journey to Prosperity. 2020.

[8] World Bank's World Development Indicators. URL: https://databank.worldbank.org/source/world-development-indicators#

[9] United Nations. Monterry Consensus of the International Conference on Financing for Development. International Conference on Financing for Development. Geneva. United Nations.2003.

[10] World Bank. Debt Report 2021, Washington DC, World Bank Group.

[11] United Nations Industrial Development Organization (UNIDO). Competitive Industrial Performance Report. 2020, Vienna. United Nations Industrial Development Organization.

change, contributed to the increase in poverty on the continent and further enhanced the level of demand uncertainty. The war in Ukraine had also contributed to the uncertainty and volatility, especially with regards to food prices and investments in the region.

Foreign direct investment (FDI) is crucial for industrialization because of its ability to transfer technology and improve industrial capacity utilization. Africa's share of global FDI had been low and even declined between 2019 and 2020. In 2019, Global FDI stock was $ 36 trillion, but in Africa and South Asia, FDI in 2019 declined. In Africa, it was by 10 percent to $ 45 billion, while in South Asia, the decline was by 5 percent to $ 474 billion. In Latin America and the Caribbean, it increased by 10 percent to $ 164 billion. In 2020, global investment flows declined by one-third to $ 1 trillion from $ 1.54 trillion in 2019.[12] Africa had the highest decline and the lowest FDI compared to other regions. According to Haraguchi et al. [1], policymakers in developing countries will need to pay attention to investment (both public and private) if they are to develop and fulfill their potential.

Financial volatility has posed serious challenges for countries, especially when it is caused by or results in a financial crisis. According to Edwards [2], the 1990s were characterized by financial crises such as the Mexican Peso collapse of 1994 and the Thai Baht crisis of 1997 that spread to the Philippines, South Korea, Malaysia and Indonesia. The crises of the 1990s also affected Brazil and Russia. All of these crises had large financial flows or volatilities at the center. These volatilities and associated crises had contributed to an output decrease and increase in unemployment and poverty [3], thus negating the benefits of diversification, welfare improvement and poverty reduction, technology transfer and unemployment reduction [4].

The continent of Africa has been a major exporter of primary products such as iron ore, crude oil, diamonds, various agricultural products, etc. Despite this, the continent has not been able to achieve the high standard of living found in industrialized countries, particularly those attained in advanced western countries. In Africa, exports as a percent of GDP fell from an average range of 25 to 29 percent between 2010 and 2013 to 24 percent in 2014 and an average of 21 percent between 2015 and 2017.[13] The total percentage share of manufacturers in merchandise trade for the continent was 18.5 as exports and 62 as imports in 2013.[14] Manufacturing share in exports for Africa in 2022, compared to the rest of the world and other regions of the world, is low. It was 37 percent for Africa compared to 76.5 percent for the world and 44.3 and 60.3 percent for South America and Latin America and the Caribbean.[15] Exports from Africa declined by 6.1 percent more than imports decline between 2019 and 2020.[16] The low share of manufacturers in exports affects the development of industries and the continent's economic growth. According to Samouel and Aram [4], some Latin American countries and others from East and Southeast Asia experienced remarkable growth because of their export promotion, which contributed to the prosperity of the industrial sector.

The nature of Africa's exports and its poor industrial linkage contributed to the rapid migration of manpower from the continent in search of avenues where their skills could be better utilized to attain a higher quality of life. This situation is aggravated by the quality of leadership in the continent, natural and man-made disasters and the fact that it becomes international news. The dearth of skilled manpower, conflicts and crisis in the continent affect the flow of external funding to the continent and contribute to making it volatile. This is because capital is highly mobile, and private investors look for the highest possible return for their investments and safe repatriation of their investments.

According to [5], volatilities in developing countries are affected by volatilities from various sources. This includes a bigger share of exogenous shocks' in developing countries from financial markets as a result of "sudden stops" of capital inflow. Instability from domestic shocks generated by policy mistakes that are self-inflicted and

[12] United Nations Conference on Trade and Development (UNCTAD).World Investment Report 2020: International Production Beyond the Pandemic, Geneva, United Nations. 2020.

[13] World Bank's World Development Indicators. URL: https://databank.worldbank.org/source/world-development-indicators#

[14] United Nations Economic Commission for Africa. Industrializing Through Trade. Economic Report Africa, 2015.

[15] UNIDO. International Yearbook of Industrial Statistics. 2023 edition.

[16] United Nations Conference on Trade and Development 2021. Handbook of Statistics 2021.

intrinsic instability of the development process are also weak. These occurrences are detrimental to the development of countries and the wellbeing of citizens. This study focuses on the effect of external financial flows and domestic credit volatility on industrialization in Africa. It measures volatility based on the standard deviation of FDI, personal remittances, domestic credit, exports and official development assistance (ODA) based on data from the World Development Indicators (WDI).

Review of empirical literature

The literature on volatility covers a wide range of areas with various findings. In a study on volatility and growth, it was found that exchange rate volatility had a negative effect on economic growth among Central and Eastern European countries during the period 2002–2018 [6]. Volatility and long run economic growth had an inverse relationship, and this was found to be worse in countries that were poor, institutionally underdeveloped, undergoing intermediate stages of financial development, or could not conduct countercyclical policies [7]. The financial crisis in Asia and exchange rate volatility were studied in [8]. the authors used EGARCH(1,1) and found that before the crisis, only three currencies displayed evidence of exchange rate asymmetries in their conditional variance, but after the fall in currencies, only one did not display a significant rise in volatility and asymmetry. Aid volatility and its costs were studied by Kharas [9], and the author found a cost of between 0.07 and 0.28 dollars on donor and recipient countries dead weight loss, which was about 1.9 percent of GDP. Another study [10] instigated country size, economic size and volatility. The study found that a one percent standard deviation increase in trade increases growth by 38 percent, but it was insignificant with regards to volatility.

On financial and capital flows, literature focused on emerging and market economies because of the developments in the Asian region. It was found that volatility in capital flows in emerging markets was explained more by push factors than pull factors. US monetary policy stance and economic performance, as well as global risk aversion, influence the volatility of capital flows to emerging markets and developing economies [11]. Financial volatility in emerging market economies, according to [12], was enhanced by the presence and activities of foreign banks in emerging countries. The volatility of foreign direct investment was increased by financial integration in emerging markets [13]. A Raddatz [14] study found that internal sources are the main causes of instability in low-income economies. External factors explained only small variations in low-income countries' output. The direct industrial effect of capital flows was considered by Tasdemir [15], where it was found that capital flows were associated with the movement of resources from the manufacturing sector in advanced economies, emerging market economies, and the Middle East and North Africa. Attention had not been given to the volatility issue on the African continent. The reallocation of resources from high-technology to low-technology firms within the manufacturing sector was also associated with capital flows in these countries. Efobi et al. [16] found in a study of forty-nine African countries that remittances drive industrialization in Africa at certain initial levels of industrialization. Capital flows were found by [17] to be associated with growth in highly externally dependent firms, which was driven by debt rather than equities, but in the long run, equities contribute to growth. This breaks down during crises thus emphasizing the need for stable capital flows. Foreign direct investment was found to have had a positive effect that was statistically significant on industrial performance in Africa, but without the expected growth in savings, technology transfer and improved domestic productivity [18]. In sub-Saharan Africa, it was found by [19] that foreign direct investment as a component of capital inflow had an adverse effect on industrial development with a unidirectional causality. It was also found that financial development had a positive effect on the development of industries with bi-directional causality. Keji [20] found that in Nigeria, FDI contributed to the slow growth of industrial output, thus implying an inverse link between industrial output growth in the country and FDI. The negative effect of FDI on SSA was found by [21]. In terms of international trade, a study [22] found that industrialization in Africa had been enhanced by trade openness between 1990 and 2019. Literature had not given attention to financial volatility and industrial development, especially in Africa. This paper intends to fill this gap.

Methodology

The Cobb-Douglas production function shows that output is dependent on factors, such as production, labor and capital as inputs in the production function. This relationship is depicted as follows:

$$Y = A\left(K^{\alpha} L^{\beta}\right), \quad (1)$$

where Y is output, A is total factor productivity, K is capital and L is labor. α and β are elasticities of capital and labor, respectively. Total factor productivity is that portion of industrial output that is not accounted for by capital and labor. This is difficult to measure in practice.

To achieve the objective of this study, data from the World Bank's World Development Indicators (WDI) was used for the period 1991–2020 for a panel of 17 African countries with available data (Benin, Botswana, Burkina Faso, Cabo Verde, Cameroon, Congo Republic, Cote d'Ivoire, Egypt Arab Republic, Gabon, Ghana, Kenya, Morocco, Niger, Nigeria, Rwanda, Togo, Tunisia). Volatility was measured for each country using growth standard deviations of exports as a percentage of gross domestic product, net foreign direct investment as a percentage of gross domestic product, net official development assistance as a percentage of gross national income and personal remittances received as a percentage of gross domestic product for external financial flows, while for macroeconomic volatility, the standard deviation of inflation for each country was used. The model is specified as follows;

$$Q_{it} = f\left(SDFdi_{it,} SDEx_{it} SDNetOda_{it}, SDPerR_{it,} X_{it,} U_{it}\right), (2)$$

where Q_{it} is manufacturing valued added (proxy for industrialization) in country I at time t, $SDFdi_{it}$ is foreign direct investment volatility in country I at time it, $SDEx_{it}$ is exports volatility of country i at time t, $SDNetOda_{it}$ is net official development assistance volatility to country I at time t, $SDPerR_{it}$ is volatility of personal remittances to country I at time t, X_{it} is a collection of other explanatory variables such as domestic credit to private sector, population as proxy for labor, $SDIfl_{it}$ is inflation volatility, a proxy measure for macroeconomic volatility.

Long panel data were used where the time dimension was greater than the cross-sectional dimension. This will give rise to a possible autocorrelation problem; therefore the Prais-Winsten regression for panel corrected standard errors (PCSE) was used. The variables were tested for stationary and were found to be stationariness at level based on the Levin-Lin and Chu (LLC) test.

Results and discussion of findings

Table presents the results of how volatility in external financial flows and domestic credit to

Table

Result of volatility effect on MVA (industrialization) in Africa

Variables **Manufacturing Value Added**	Coefficient	Panel Corrected Standard Error	Z	P>|z|
Domestic credit to private sector by banks	−0.375***	0.145	−2.58	0.010
Exports	0.007	0.097	0.07	0.945
External debt	0.008	0.033	0.23	0.818
Foreign Direct Investment	0.460***	0.117	3.92	0.000
inflation	−0.020	0.049	−0.40	0.688
Net ODA	0.324***	0.075	4.31	0.000
Personal remittances	0.055	0.318	0.17	0.862
Population	1.376***	0.291	4.73	0.000
Constant	−11.396**	4.839	−2.36	0.019

Note: *,**,*** signifies statistical significance at 10, 5 and 1 percent, respectively.

Source: Author's computation.

the private sector affects manufacturing value added (industrialization) in Africa.

From *Table,* volatility in domestic credit to the private sector had a negative effect on industrialization with a statistically significant coefficient. This implies that as domestic credit changes in unexpected ways, industrialization is adversely affected. This is because stable funding for industrial development is largely provided by domestic financial institutions. When it becomes volatile, it makes planning and access to funding for entrepreneurs very difficult, which eventually hampers growth. Among small manufacturers, only one in three has access to a loan or line of credit. Those who suffer most are in Sub-Saharan Africa, with only 15 percent having access to financial services, compared to 17 percent for LDCs and 44.2 percent for Latin America[5]. Conflicts in African countries, such as the Arab Spring uprising that affected countries like Egypt, Tunisia, Libya, Sudan, and the Boko Haram crisis in Nigeria, coupled with drought in the Horn of Africa have made domestic credit volatile, with adverse effects on industrialization on the continent. Also, political tension associated with elections in countries of the continent contributed to such volatilities. The weak nature of financial institutions on the continent has made it difficult for sustainable long-term funding for industrialization. Therefore, credits are available only for the short term, thus making funding for industrial development volatile. This is coupled with the underdeveloped nature of money and capital markets with limited financial instruments. This makes switching to other forms of funding very difficult, thereby amplifying domestic credit volatility. Financial deepening was found in a study on Mexico and the USA by [23] to reduce growth volatility. Jarretta, Mohaddes, and Mohtadi [24] did a study among oil-producing countries with weak and better financial institutions that were subjected to the oil price shocks of 2014. Better financial institutions were found to reduce output volatility.

Foreign direct investment volatility has had a positive effect on industrialization in Africa. The coefficient is statistically significant. This finding implies that the changes in the net inflow of FDI, manufacturing output in Africa contribute to its growth. A combination of factors is responsible for this finding; the increasing role of domestic funding to the manufacturing sector, the impact of micro, small and medium scale enterprises in the manufacturing sector further ensured stability. Also, the intrafirm inflow by multinational enterprises, which is less volatile due to the greater certainty of the business environment in Africa, had contributed to this finding. According to the World Bank,[17] FDI has been the least volatile and most resilient component of financial flows. Moreover, the investment climate in Africa has been improving over the years, making Africa a more investment-friendly continent. This had led to improvements in FDI inward stock on the continent compared to the outward stock. The inward stock in 2000, 2010 and 2021 was 153 062, 623 756, 1 026 320 million dollars (respectively), while the outward stock for the corresponding periods was 39 815, 137 363, 301 252 million dollars (respectively). Between 2020 and 2022 FDI inflows more than doubled from 39 billion dollars to 83 billion dollars, and from this was inflated by a single large intrafirm transaction [25], which was less prone to negative volatility. Moreover, the manufacturing sector, is more stable in its response to world price volatility.

Net official development assistance volatility had a positive effect on industrialization in Africa with a statistically significant coefficient. The amount of net ODA had been relatively stable, between 3 and 4 percent of gross national income, with a standard deviation of about 1 percent. Aid volatility given in response to natural disasters, successive droughts and other related problems serves as a form of insurance and generates volatility disbursement effects, which is good aid. Increased production of goods and services to support those affected by such disasters will yield a positive aid volatility effect on industrialization. But it can also be costly for recipient countries because it magnifies the real business cycle and generates negative income shocks in developing countries.

Population had a positive effect on industrialization. This points to the influence of demand for the goods produced by firms due to the continent's population size. According to UNIDO,[18] about 1.3 billion people, or 17 percent of the

[17] World Bank. Debt Report 2021, Washington DC, World Bank Group.

[18] United Nations Industrial Development Organization (UNIDO). International Yearbook of Industrial Statistics: Edition 2022, Vienna: United Nations Industrial Development Organization.

world's population, lived in Africa in 2019. This will definitely have a positive demand effect on goods and services because domestic demand is a major source of demand for many countries. Also, the skill applied in the production of goods and services by labor in the manufacturing industries of the continent.

Conclusion and recommendations

Industrializing Africa is necessary if it to live up to its full potential. The continent had a higher level of MVA share in gross domestic product compared to the world. External finances are crucial for the realization of this goal. The volatility of FDI, net ODA had positive effects on MVA, which implied that these were good volatilities, while domestic credit to private sector volatility had a negative effect.

The capacity of financial institutions in many African countries is so weak that they are unable to mobilize large-scale capital for firms and households to facilitate industrialization on the continent. Commercial and other developmental banks of countries should be recapitalized. This will enable them to provide long-term funds, and will minimize domestic credit volatility, reduce the cost of borrowing and facilitate industrialization.

The Africa Union (AU) should set up a regional monetary policy coordinating agency that will work toward harmonizing domestic policy differences. The agency should facilitate the establishment of a common regional monetary policy framework. This will eventually reverse the high level of monetary and credit policy heterogeneity and facilitate more capital inflows into the continent.

Governments on the continent should broaden the space for capital market development through technological innovation and infrastructure, improvements in regulatory frameworks, the enforcement of contracts and the curbing of illicit financial flows. This will provide an additional avenue for domestic credit mobilization that will facilitate industrialization.

The continent will have to consolidate on the good volatilities by improving on regional trade and investment policies, especially the Africa continental free trade area, which will boost manufacturing output both for intra-regional and export trade with other regions of the world.

Domestic stability should be pursued through the establishment of strong institutions, micro- and macro-prudential policies and credit guarantees by governments. This will minimize domestic financial volatility on the continent.

REFERENCES

1. Haraguchi N., Martorano B., Sanfilippo M. What Factors Drive Successful Industrialization? Evidence and Implications for Developing Countries. *Structural Change and Economic Dynamics.* 2019; Jun1;49:266–276. URL: https://doi.org/10.1016/j.strueco.2018.11.002
2. Edwards S. Introduction to Capital Flows and the Emerging Economies: Theory, Evidence, and Controversies. In Capital Flows and the Emerging Economies: Theory, Evidence, and Controversies 2000; Jan 1: 1–12. University of Chicago Press. URL: https://www.nber.org/system/files/chapters/c6162/c6162.pdf
3. Cailloux J., Griffith-Jones S. Global Capital Flows to East Asia: Surges and Reversals. In: Griffith-Jones S., Gottschalk R., Cailloux J., editors. International Capital Flows in Calm and Turbulent Times. Michigan: University of Michigan Press; 2003.
4. Samouel B., Aram B. The Determinants of Industrialization: Empirical Evidence for Africa. *European Scientific Journal*. 2016; Apr 1;12(10):219–239. URL: https://core.ac.uk/download/pdf/328025425.pdf
5. Loayza N., Rancie`re R., Serve´n L., Ventura J. Macroeconomic Volatility and Welfare in Developing Countries: An Introduction. *The World Bank Economic Review.* 2007;21(3):343–357. DOI: 10.1093/wber/lhm017.
6. Morina F., Hysa E., Ergün U., Panait M., Voica MC. The Effect of Exchange Rate Volatility on Economic Growth: Case of the CEE Countries. *Journal of Risk and Financial Management.* 2020; Aug 10;13(8):177. DOI: 10.3390/jrfm13080177.
7. Hnatkovska V., Loayza N. Volatility and Growth. In: Azeinman J.J., Pinto B, ed. Managing Economic volatility and Crises. Cambridge: Cambridge University Press; 2005:65–100.
8. Baharumshah A.Z., Wooi H.C. Exchange Rate Volatility and the Asian Financial Crisis: Evidence from South Korea and ASEAN-5. *Review of Pacific Basin Financial Markets and Policies.* 2007;10(2):237–264. URL: https://doi.org/10.1142/S 0219091507001057

9. Kharas H. Measuring the Cost of Aid Volatility. Wolfensohn Center for Development. Working Paper 3. 2008. URL: https://www.brookings.edu/wp-content/uploads/2016/06/07_aid_volatility_kharas.pdf (accessed on 20.12.2023).
10. Pagliari M.S., Hanan S.A. The volatility of capital flows in emerging markets: Measures and determinants. *Journal of International Money and Finance.* 2024 May 15:103095. URL: https://doi.org/10.1016/j.jimonfin.2024.103095
11. Alouini O., Hubert P. Country Size, Economic Performance and Volatility. *Revue de l'OFCE.* 2019;164:139–163. URL: https://www.cairn-int.info/revue-de-l-ofce-2019–4-page-139.htm&wt.src=pdf
12. Beck R. The volatility of capital flows to emerging markets and financial services trade. *CFS Working Paper*. 2000/11.2000;1–24.
13. Neumann R.M., Penl R., Tanku A. Volatility of capital flows and financial liberalization: Do specific flows respond differently? *International Review of Economics and Finance.* 2009;18(3):488–501.
14. Raddatz C. Are External Shocks Responsible for the Instability of Output in Low-Income Countries? *Journal of Development Economics.* 2007;84(1):155–187.
15. Tasdemir F. Do capital Flows Cause (De)Industralization? *Economic Forum Egypt.* 2023. In: ERF 29th Annual Conference. 4–6 May.
16. Efobi U., Asongu S., Okafor C., Tchamyou V., Tanankem B. Remittances, Finance and Industrialisation in Africa. *Journal of Multinational Financial Management.* 2019;49:54–66. DOI: 10.1016/j.mulfin.2019.02.2002
17. Ignan D., Kulan A.M., Mirzaei A. The Real Effects of Capital Flows in Emerging Markets. *Journal of Banking and Finance.* 2020;119. DOI: 10.1016/j.jbankfin.2020.105933
18. Adegboye F.B. Foreign Direct Investment and Industrial Performance in Africa. *The Social Sciences*. 2016;11(24):5830-5837.
19. Appiah M., Gyemfi A.B., Adebayo S.I., Bekun F.V. Do Financial Development, Foreign Direct Investment and Economic Growth Enhance Industrial Development? Fresh Evidence from Sub-Sahara African Countries. P*ortuguese Economic Journal*. 2023;22:203-227. DOI: 10.1007/s10258-022-00207-0
20. Keji S.A. Industrial Output Growth and Foreign Direct Investment in Nigeria. *Future Business Journal*. 2023;9(58).
21. Oduola M., Bello M.O., Popoola R. Foreign Direct Investment, Institution and Industralisation in Sub-Sahara Africa. *Economic Change and Restructuring.* 2022;55:577-606. DOI: 10.1007/s10644-021-09322-y
22. Mignamissi D., Nguekeng B. Trade Opennes-Industrialization Nexus Revsited in Africa. *Economic Change and Restructuring*. 2022;55:2547-2575. DOI: 10.1007/s10644-022-09401-8
23. Cermeño R., García M.J., González-Vega C. Financial Development and the Volatility of Growth: Time Series Evidence for Mexico and United States. Monetaria. 2016;195-232.
24. Jarretta U., Mohaddes K., Mohtadi H. Oil price volatility, financial institutions and economic growth. *Energy* Policy. 2019;126:131-144.
25. Eregha P. Foreign Direct Investment Inflow, Volatility and Domestic Investment in West Africa. *Journal of Developing Areas*. 2015;49(2):273-294.

ABOUT THE AUTHOR / ИНФОРМАЦИЯ ОБ АВТОРЕ

Wushibba Bako — Ph.D. in economics, Lecturer with the Department of Economics, Plateau State University, Bokkos, Nigeria
Вушибба Бако — Ph.D. (экон.), преподаватель департамента экономики, Университет штата Плато, Боккос, Нигерия
http://orcid.org/0000-0003-4947-8913
bako.wushiba@plasu.edu.ng

Conflicts of Interest Statement: The author has no conflicts of interest to declare.

The article was submitted on 29.12.2023; revised on 06.05.2024 and accepted for publication on 07.06.2024. The author read and approved the final version of the manuscript.