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Assimilating Islamic Banking Customer Loyalty: A Halal Brand Personality Perspective Model

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Abstract
As the Indonesian government promotes Indonesia as the center of the Halal Industry Nation, numerous strategies are being implemented across every sector, including Islamic Financial Institutions. This research focuses on investigating factors that can influence customer loyalty. The study aims to create a model for increasing customer loyalty based on the Halal Brand Personality approach by exploring competitive advantage as a mediating variable to bridge this gap. This research is important due to the relatively small market share of Islamic banking in Indonesia, which faces intense competition. This explanatory research with a quantitative approach employs a survey method to collect 225 data points. Structural Equation Modeling (SEM) is used to analyze each variable's direct and indirect relationship. It was found that of all the hypotheses, six were rejected, and the model was validated. The result delineated that the model proposed in this research can assist branch managers in maximizing and strengthening Islamic banking's distinctive products and sophisticated technology, which are its primary competitive advantages when competing with other banking sectors.

Keywords:
halal brand personality; competitive advantage; customer loyalty; Islamic bank

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INTRODUCTION

Despite being Asia's most populous Muslim nation, Indonesia has not successfully established Islamic banking as a preferred financial sector. Although the substantial Muslim population in Indonesia reached approximately 87.2% of the total population (Indonesia.go.id, 2020), the market share of Islamic banking in the country only exceeded 6.65% by 2022 (Otoritas Jasa Keuangan, 2022). The present analysis indicates that the Islamic banking sector remains challenged to establish a solid foundation, necessitating many enhancements across several domains. The relatively small market share in the Islamic banking business can be attributed to a need for more customer loyalty (Berita Satu Ekonomi, 2015). This phenomenon occurred due to customers' predominant utilization of Islamic banking services or products primarily for administrative functions. In light of this circumstance, it is recommended that Indonesia embrace this opportunity to expedite the progress of the Islamic banking sector, intending to augment market share and foster customer loyalty. This condition can be achieved by strategically considering competitive advantage factors and actively promoting the presence of Islamic banking within the Islamic financial industry. Such efforts align with the government's objective of establishing Indonesia as a prominent hub for the Halal Industry.

The need for loyal customers is actively participating in developing the Islamic banking sector, significantly contributing to the small percentage of the Islamic banking market share. Customer loyalty is commonly attained by ensuring customer satisfaction, which is frequently the outcome of positive impressions and a genuine interest in the services and goods provided by the bank (Hidayat et al., 2019; Özkan et al., 2020). On the contrary, adverse encounters have the potential to engender discontentment and a decline in patron allegiance (Emanuela & Iuliana, 2016; Fida et al., 2020), which is reflected in the declining number of consumers. Furthermore, the absence of substantial competitive benefits may potentially deter society from adopting Islamic banking products and services. Islamic banks are commonly seen as having comparable services and exhibit few distinctions compared to conventional financial institutions (Jayathilake et al., 2016; Oliver, 1999).

Hence, to maintain and enhance consumer loyalty and competitive advantage, Islamic banks need to ensure the continued existence of Islamic banking by creating a brand personality that can attract new customers and retain existing ones (Thomas & Sekar, 2008). To achieve this, the implementation of a halal brand personality is a potential strategy that can help to differentiate and strengthen the Islamic banking sector, generating public interest in using Islamic banking products and services (Ahmad, 2015; Zainudin et al., 2020) and leading to an increase in loyal customers. Additionally, the trend of the halal lifestyle in Indonesia is affecting customer behavior when choosing financial services, making implementing a halal brand personality even more critical. With Islamic banking emerging as one of the vital halal industries in the financial sector, Indonesia has an enormous opportunity to become the center of the Islamic financial sector. Therefore, the Islamic banking sector needs to consider consumer behavior and develop an accurate strategy to increase customer loyalty.

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In Indonesia, particularly Islamic universities have the potential to be a significant market for the growth of Islamic banking. This condition is because Indonesia has many Islamic universities, according to the Indonesia Religion Ministry, which plays a significant role in promoting the development of Islamic banking by utilizing Islamic banking products and services in their day-to-day administrative activities for employees and students. The Indonesia Islamic University Conference (IIUC) 2017 report also stated that Islamic banking and universities share the same goal of achieving human welfare through the Islamic financial industry (Rahman, 2017). Therefore, the present study focuses on students of Islamic universities as the research population to investigate this issue.

The primary objective of this article is to conduct an in-depth analysis of the interconnections among the components of halal brand personality, competitive advantage, and consumer loyalty. This condition is considered essential because Indonesia still needs Islamic banking loyalist customers as a Muslim-majority country. It occurs because they think that Islamic banking products and services are the same as conventional and are limited to accessing other services such as e-commerce, m-payment, and other features.

This research considers the role of competitive advantage as a mediating variable in this process to fill the gap. The existing body of literature regarding the halal brand personality still lacks more cohesive information in revealing the role of its Islamic banking competitive advantage from the customers' perspective. Furthermore, Halal Brand Personality (HBP) construction in Islamic banking sectors still needs to be improved in the Islamic financial industry because most research regarding HBP was conducted in Halal Industry sectors such as fashion, food, and beverage. Therefore, this research aims to develop a model to improve customer loyalty to Islamic banking based on Halal Brand Personality (HBP) to differentiate and strengthen the Islamic banking sector, leading to generating public interest in using Islamic banking products and services, leading to customer loyalty. This research examines the direct and indirect relationship between the components of HBP and customer loyalty through the role of the mediating variable in Islamic banking as the representative of the Islamic financial industry.

METHODS

This research is explanatory research approached by quantitative with survey method to address research questions, as well as uses a positivism paradigm which aims to obtain objectivity by data verification conclusively through empirical observation and logical analysis. In this situation, a survey method is conducted to obtain information relating to the determinants of Halal Brand Personality (HBP) as a strategy to improve customer loyalty by exploring the role of competitive advantage as a mediation variable in the Islamic banking sector in Indonesia.

As independent variables, the indicators of the components of HBP, such as purity, safety, excitement, righteousness, and sophistication, were developed based on the concept of brand personality by Aaker (1997) and Ahmad (2015), consisting of 26

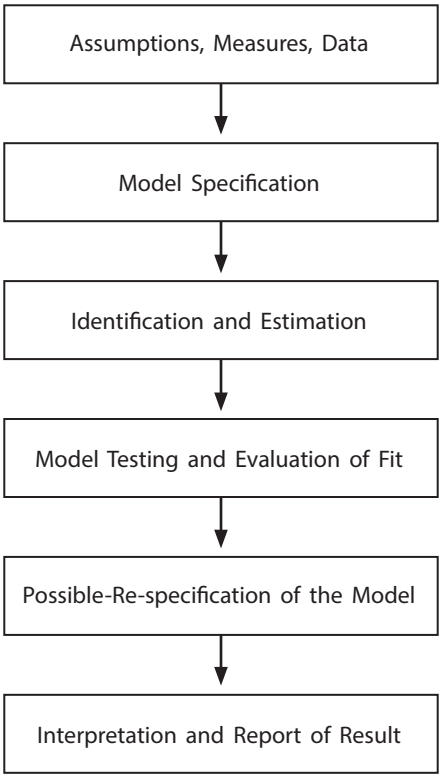
items to represent HBP. This research also used competitive advantage as a mediating variable to represent companies' capacity. The mediating variable in this research explains the complex relationship and the mechanism between the independent and dependent variables. This research uses Kaleka (2002) and Kotler (2012) concepts with 4 (four) indicators to measure the mediating variable. Loyalty is a dependent variable because, as an intangible asset, loyalty becomes the most essential indicator for various companies in the marketplace. This variable is measured based on 4 (four) leading indicators referring to Griffin (1995) and Oliver (1999).

This research picks a student university of Islamic Economics major in Indonesia as a sample, considering several characteristics such as being an Islamic banking user for about ± 1 year and aged ≥ 18 (min). The sample is collected using a convincing sampling technique from a conveniently available pool of respondents (Henseler et al., 2009). Furthermore, G-Form is used to distribute the questionnaire because of its speed, simplicity, and economical aspects. 400 questionnaires based on the Likert scale were distributed, and 225 were returned. Then, the Structural Equation Model (SEM) is used to analyze this issue more deeply (the flow chart is shown in Figure 1). Mathematically, the research model can be written as follows:

$$CA = \beta_0 + \beta_1 Pur + \beta_2 Safe + \beta_3 Right + \beta_4 Exc + \beta_5 Soph + \varepsilon_1 \quad (1)$$

$$CL = \beta_0 + \beta_1 Pur + \beta_2 Safe + \beta_3 Right + \beta_4 Exc + \beta_5 Soph + \beta_6 CA + \varepsilon_2 \quad (2)$$

Figure 1. Structural Equation Model Flow Chart



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RESULT AND DISCUSSIONS

Table 1 presents the sample's demographic characteristics, indicating that a significant majority falls between the age range of 22-25. This result indicates that Islamic banking has strategically focused on the younger population. The youth segment is currently the primary demographic that has garnered significant attention from Sharia financial institutions due to the growing influence of the hijrah lifestyle. Moreover, as illustrated in the table, the data reveals that 56.44% of the participants are identified as females, while 43.56% are classified as males. Additionally, it is noteworthy that these individuals possess 3-4 years of experience in adopting Islamic banking services.

Table 1. Sample Characteristic

Category	Indicators	Frequency	(%)
Aged	18-21 years	67	29,78
	22-25 years	126	56
	> 25 years	32	14,22
Gender	Male	98	43,56
	Female	127	56,44
Period in using Islamic banking services	1-2 years	69	30,67
	3-4 years	124	55,11
	> 4 years	32	14,22

Source: Data processed

The research instrument was developed by implementing a set of 26 items that represent five aspects of halal brand personality, mainly purification, safety, excitement, righteousness, and sophistication. The instrument also included measures of competitive advantage and consumer loyalty, as described in Table 2. In addition, this study applies a Likert scale to assess each variable, with a range of 6 (indicating strong agreement) to 1 (indicating severe disagreement). The elements related to the halal brand personality were derived and previously established by Aaker (1997) and Ahmad (2015). These items have been adjusted in their phrasing to align with the context of the Islamic banking sector. Furthermore, it is notable that most respondents reported an average score above 4.00 for each item. This result indicates that all the indicators examined in the study can effectively represent the halal brand personality to enhance the competitive advantage of Islamic banking and foster customer loyalty.

Table 2. Measurement Items

Halal Brand Personality	Average	Description
Modified from Aaker (1997) and Ahmad (2015)		
(Purify)		
Islamic banking products and services are appropriate with sharia compliance	4.803	Good
Assets purification through zakat annually	4.870	Good
Halal certified products	4.607	Good
Carrying universal value (justice, togetherness, expediency)	4.834	Good
(Safety)		
Supervised by sharia supervisory board and OJK	4.843	Good
Safety financial management	4.888	Good
Avoiding fixed interest	4.781	Good
Transparent in every transaction	4.803	Good
(Excitement)		
Profit and revenue sharing principles	4.705	Good
socio-oriented product (qardh)	4.834	Good
Offers suquk	4.799	Good
Financing product for SMEs	4.834	Good
(Righteousness)		
Actuating based on sharia contract concept	4.906	Good
Qualified human resources in Islamic finance field	4.816	Good
Every human resources in sharia bank are wear syar'i clothes	4.843	Good
(Sophistication)		
Positioning customer as a business partnership	4.700	Good
Mobile banking usage	4.741	Good
Offers universal products	4.723	Good
Competitive Advantage	**Average**	**Description**
Modified from Kaleka (2002) and Kotler (2012)		
Islamic banks offer financing product with affordable margin	4.808	Good
Islamic banks products are able to fulfill financial needs of society	4.897	Good
Islamic banks' ATM machines are easy to grab	4.312	Good
Islamic banks products and services are able to give such a spiritual and material advantages	4.536	Good
Customer Loyalty	**Average**	**Description**
Modified from Griffin (1995) and Oliver (1999)		
Customers are willing to use and consume product/services continuously	4.758	Good
Customers are willing to use and consume other products/services which offered by sharia banks	4.843	Good
Customers are spreading positive and valid information to other people	4.781	Good
Customers are not easily deceived by the attractiveness of other companies' products	4.745	Good

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Table 3 reveals the factor loading of Confirmatory Factor Analysis (CFA). There are some characteristics to identify factor loading. According to Hair et al. (2010), the best factor loading is above 0,70, but around 0,50 is also acceptable. Convergent validity was conducted to assess a significant loading of items by considering the number of Average Variance Extracted (AVE) and Construct Reliability (CR). 26 indicators were examined based on CFA, and only 18 indicators passed the criteria of CFA loading. This condition happened because several items were removed, such as pure1, Pure2 due to the lowest loadings. The same condition also happened on safe3, safe4, exct4, Right1, and CL1. Therefore, the final CFA loading can be seen in Table 3, which reveals that all the EVA and CR of each item were greater than 0,70.

Table 3. Factor Loading of Confirmatory Factor Analysis

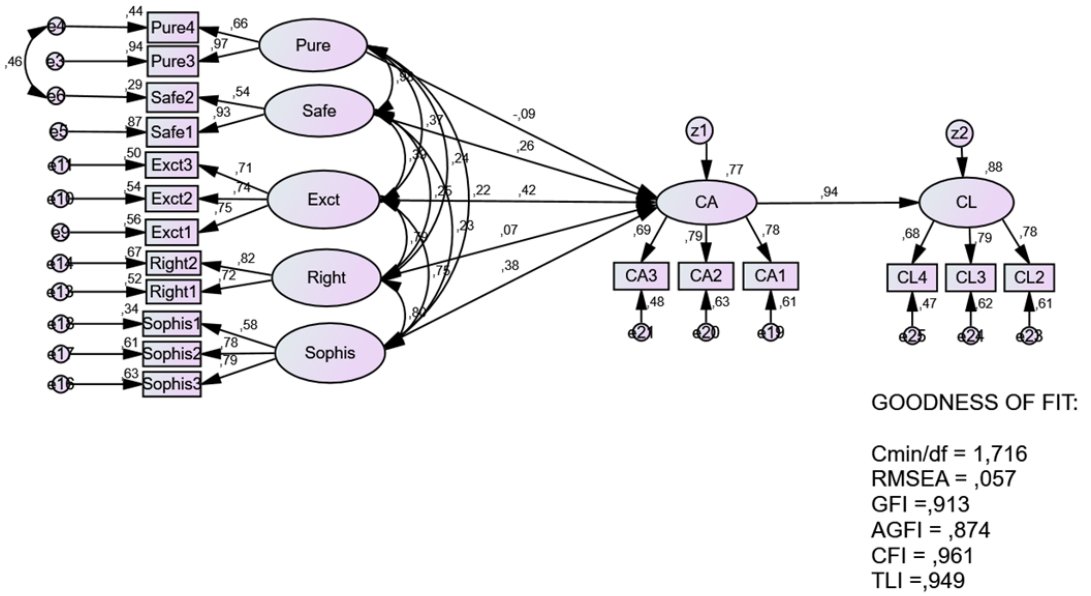
Variables	Scale Items	Path Estimate*	Average Variance Extracted	Construct Reliability
Purify	Pure3	0,968	0,956	0,977
	Pure4	0,664		
Safety	Safe1	0,931	0,939	0,966
	Safe2	0,537		
Excitement	Exct1	0,751	0,951	0,983
	Exct2	0,737		
	Exct3	0,706		
Righteousness	Right1	0,724	0,952	0,975
	Right2	0,819		
Sophistication	Sophis1	0,582	0,953	0,984
	Sophis2	0,783		
	Sophis3	0,792		
Competitive Advantage	CA1	0,782	0,964	0,988
	CA2	0,792		
	CA3	0,695		
Customer Loyalty	CL2	0,782	0,962	0,987
	CL3	0,788		
	CL4	0,682		

Furthermore, the path estimates of the measurement model are also above 0,50 and higher. After conducting Confirmatory Factor Analysis, Structural Equation Modeling is conducted to evaluate the research model to introduce the strength and fit model of research. The overall model of this research is depicted in Figure 2.

Figure 2 shows the final model of this research depicting the direct and indirect relationship between the components of halal brand personality on competitive

advantage and customer loyalty. According to the result, it can be seen that the final model is considered good and acceptable because it already accomplishes all the criteria of Goodness of Fit (GOF) such as CMIN/DF 1,716<2 is good; GFI 0,913>0,090 is good; AGFI 0,874>0,80 is good; CFI 0,961>0,90 is good; and TLI 0,949>0,90 is good. Therefore, the summary of direct and indirect effects between research variables shows in Table 4.

Figure 2. Structural Equation Model with Causal Relationship



As part of the sharia financial industry, Islamic banks have characteristics that reflect sharia principles in every operational activity, which differ from conventional banks. Halal Brand Personality is one of the prominent aspects of Sharia banks, which is considered the most. By developing and establishing a halal brand personality, the banks can prove their brand personality by putting forward such morality aspects, which leads Islamic banks' products and services to depict sharia compliance more. Based on the result, it is evidence that halal brand personality dimensions become a potential aspect of increasing Islamic banking competitive advantages. Then, it is in line that halal brand personality has an essential role for Islamic banks to strengthen their competitive advantages in terms of products and services by putting forward the sharia aspect to compete with others, which more attract several consumers, specifically Muslim who tend to consume and use halal certified product and services (Ramdzan Ali et al., 2021).

As one of the five dimensions of halal brand personality, purifying becomes an essential and critical factor that Islamic banking has considered the most. This factor can depict the Sharia compliance side of Islamic banking brand personality, making it different from conventional banks. Then, this factor also indicates that Islamic baking products and services are verified free from any prohibited (haram) elements (Zainudin et al., 2020). It happens because the purifying factor is tied to

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businesses' sincerity, which significantly relies on the concept of morality (Rubiyanti et al., 2022). Owing to that, when Islamic banking can retain Sharia compliance properly, it boosts and strengthens its competitive advantage, leading to customer trust (Williams, 2018).

Nevertheless, the result depicted in Table 4 is conversely, revealing that purification has no significant effect on Islamic banking's competitive advantage. This result contradicts previous research, which reported that purifying becomes an essential success of halal brand personality to support Islamic banking business activities (Ramdzan Ali et al., 2021; Zainudin et al., 2020). This condition occurs because customers strongly believe an expediency-justice product is more acceptable to fulfill their financial needs. After all, halal certified product is considered unnecessarily able to provide such convenience and expediency. Furthermore, Sharia compliance aspects are optional for Indonesians when consuming products because they are rational thinkers. They tend to think that accessible features, affordable prices, and the rate of profits become the most considerable aspects of choosing financial products or services. In addition, most customers use Islamic banking products only for administrative purposes. This argument is proved by the result depicted in Table 2, reporting that the indicator of halal certification reached a small number compared to another indicator of purify.

Table 4. Hypotheses Test

	Hypothesis	Coefficient	Prob.	Effect	Description
H1	Competitive Advantage ← Purify	0,150	0,350	Insignificant	Declined
H2	Competitive Advantage ← Safety	-0,014	0,924	Insignificant	Declined
H3	Competitive Advantage ← Excitement	0,498	0,000	Positive Significant	Accepted
H4	Competitive Advantage ← Righteousness	-0,091	0,557	Insignificant	Declined
H5	Competitive Advantage ← Sophistication	0,496	0,001	Positive Significant	Accepted
H6	Customer Loyalty ← Competitive Advantage	0,917	0,000	Positive Significant	Accepted
H7	Customer Loyalty ← Competitive Advantage ← Purify	0,455	0.062	Insignificant	Declined
H8	Customer Loyalty ← Competitive Advantage ← Safety	-0,083	0.442	Insignificant	Declined
H9	Customer Loyalty ← Competitive Advantage ← Excitement	0,456	0,000	Positive Significant	Accepted
H10	Customer Loyalty ← Competitive Advantage ← Righteousness	-0,013	0.247	Insignificant	Declined
H11	Customer Loyalty ← Competitive Advantage ← Sophistication	0,138	0.004	Positive Significant	Accepted

Furthermore, safety also becomes another prominent factor of halal brand personality that possibly increases Islamic banking's competitive advantage. This condition happened because, as an intermediary institution, an Islamic bank must secure the number of capital entrusted by the third party, as well as ensure customer safety while consuming such products and services offered by Islamic bank (Choi & Lee, 2019; Ramdzan Ali et al., 2021). This result aligns with Auda (2019), who delineated that every muamalah activity requires safety for every engaged individual. It is relevant to the sharia concept, which is reflected by maqāṣid al-syariah (hifdz al-nafs and hifdz al-māl), which is considered relevant to Muslim consumers' tendency to consume halal products. However, this research finds conversely, reporting that safety has no significant effect on increasing Islamic banking's competitive advantage. This is because respondents tend to think that Islamic banking is still adopting an interest rate, which is no specific difference from conventional one. This condition leads customers to speed up their payments. They need to meet the cap they committed to set because they cannot guarantee that the current rate is the lowest they will ever witness. This argument is proved by the result depicted in Table 2. This result reports that the indicator of avoiding a fixed rate reached a small number compared to another safety indicator. Moreover, most customers tend to think that Indonesia's Islamic banking defense system is still unsafe because it is frequently exposed to cyber-attacks, leading to panic attacks that traumatize them in suing Islamic banking products and services.

The close condition also can be seen from righteousness, one of the factors of halal brand personality reporting that it does not significantly influence competitive advantage and loyalty. It has happened due to customers' perception regarding the quality of Islamic banking's human resources. They tend to think that Islamic banking human resources need to be qualified more because, in Indonesia, most human resources have no specific educational background in Islamic banking operational activity (table 2). This argument was also proved by El-Seoudi et al. (2012) who explained that the majority of Islamic banking human resources have not received appropriate training to express the goals and direction of the Islamic bank as the value and principle of Islamic financial operation based on Islamic teaching because majority of them are not graduated from Islamic economics study.

Furthermore, to strengthen and increase their competitive advantage, Islamic banks must be more adaptive in proposing their products and services, which attract and trigger consumers to get excited about using products offered by the Islamic banking sector. Thus, the numerous products offered by Islamic banks also have to represent its unique side as a "friendly" financial institution concerned with an ethic-social orientation by caring sharia principle, which attracts consumers to use it as the effect of hijrah and halal lifestyle, which able to get more consumer excitement while using Islamic banking products. Therefore, excitement, defined as an emotional expression of consumers over a brand, becomes one factor that triggers and encourages consumers to buy Islamic banking products. It is in line with Table

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2, which shows that the indicators of excitement variable reached approximately 4.778, which is categorized as Good. Then, Delafrooz et al. (2017), Raithel & Schwaiger (2015), and Zainudin et al. (2020) also reported that having attractive brands will portray contemporary and current elements that ultimately have a positive influence on consumer attitudes, potentially creating brand loyalty among consumers (Ahmad, 2015). According to the result of the survey reported in Table 2, it can be seen that customers are keen on Islamic banking because of the unique products with a unique scheme offered by the bank as an alternative to save, deposit, and invest their capital, which is possible for them to gain more capital from different financial sources. Thus, referring to the finding, an exciting product based on ethic-social orientation can be one of Islamic banking's competitive advantages to attract customers using the products.

Besides an attractive product to increase competitive advantage, sophistication, defined as digital technology usage to drive Islamic banking strategy in increasing Islamic banking competitive advantage, is also considered a crucial factor. It is because, in response to the new competitive landscape, Islamic banks are striving to think two or three steps beyond the offerings they currently provide to customers. Most customers tend to explore how technology can help them advance their financial service needs, leading them to look for financial services that can make valuable recommendations and convenience to fulfill their needs regarding financial services (Johnson, 2017). This condition is in line with the findings of this research, revealing that sophistication has a significant effect on Islamic banking's competitive advantage (table 4). Moreover, sophistication in this condition is not only in terms of technological factors but also a different business model offered by Islamic banking, which treats customers as a business partnership, not a debtor. This business model represents an Islamic business model with a profit-sharing scheme(muḍāraba and musyāraka), making customers more convenient to use Islamic banking products and services and triggering consumers' trust (Raithel & Schwaiger, 2015).

Table 4 shows that competitive advantage positively and significantly influences customer loyalty. The existence of the former is potentially increased the latter. This condition happened because competitive advantage becomes a crucial aspect for every company as its strength to attract consumers in choosing its products and services (Ahmadia, 2017; Al Karim et al., 2023). Furthermore, several previous kinds of research also reported that competitive advantage triggered customer trust because it reflected companies' performance and reputation, which led to customer satisfaction, and tended to consume such companies' products or services continuously as well as leaded consumer loyalty (Asnawi et al., 2020; Gopalsamy & Gokulapadmanaban, 2021). This condition occurs because when Islamic bank offers better products and services, such as more competitive interest rates, lower fees, or additional favorable features, it may attract consumers' attention. Because consumers will tend to stay with the bank if they feel they are getting better value. Moreover, banks with a good reputation for safety, integrity, and business ethics are more likely to gain consumer trust. Because consumers who trust

the bank will be more likely to remain loyal, even if there are competitors with more attractive offers.

Moreover, Al Karim et al. (2023)also delineated that companies could reach consumer loyalty if the former experienced a better experience with the latter relating to the quality of product and service quality, which are part of the competitive advantage that firms have built. This condition is also in line with the respondents' description answer, which reported that most consumers tend to be loyal to Islamic banks when the banks can fulfill their needs relating to the financial sector, reaching approximately 4.897(Table 2). Therefore, in a highly competitive banking environment, Islamic banks must constantly strive to maintain and improve their competitive advantage to influence customer loyalty. High customer loyalty can help the bank maintain its market share, reduce new customer acquisition costs, and increase long-term revenue.

Table 4 and Figure 2 show that the competitive advantage variable can mediate and strengthen the indirect relationship between halal brand personality factors (specifically for excitement and sophistication) and customer loyalty. It is because excitement and sophistication are the two factors representing the core values and characteristics of Islamic banking operational activity in running a business model. This condition is in line with Memon et al. (2021), who reported that brand personality became one of the crucial aspects of increasing competitive advantage because a bank's competitive advantage can increase customer satisfaction. Customers tend to be more satisfied if an Islamic bank can provide better, more efficient, or more responsive services than its competitors. An upbeat brand personality can also increase customer satisfaction by building a solid emotional connection between the bank and the customer.

Thus, when customers are already loyal to Islamic banks, they are willing to consistently use and consume other products/services offered by Sharia banks (Rudzewicz & Strychalska-Rudzewicz, 2021). It is appropriate with factual data which reported that such loyal customers have a strong tendency and desire to consume the same or even another company product (table 4). Furthermore, a halal brand personality strongly enhances customer loyalty, specifically students of Islamic Universities, because of the trend of a halal lifestyle, which triggers the phenomenon of hijrah intention, affecting their preferences in consuming such certified products that are appropriate to Sharia principles.

CONCLUSION

This study examines the determinants of Halal Brand Personality to Islamic banking customer loyalty by exploring the role of competitive advantage as a mediating variable in Indonesia. Regarding the empirical findings, we discover that from the five dimensions, only the dimensions of excitement and sophistication, which constitute the halal brand personality, exert a positive and significant influence on enhancing the

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competitive advantage of Islamic banking, leading to customer loyalty. These findings align with the indirect effect result reporting that the variable of competitive advantage can strengthen and mediate the relationship between halal brand personality factors (specifically for excitement and sophistication) and customer loyalty. This condition means that the better the excitement and sophistication of Islamic banking, the more competitive advantage, which affects the increasing customer loyalty.

Referring to the findings, we may conclude that Halal Brand Personality brings a significant policy intervention to retain customer loyalty in a tremendously competitive banking industry. Therefore, strengthening excitement and sophistication factors are essential for Islamic banking branch managers in strengthening Islamic banking distinctive products and sophisticated systems to compete with other banking sectors by maximizing halal brand personality factors (specifically for excitement and sophistication) to enhance and retain customer loyalty. Nowadays, Indonesians are still rational thinkers who tend to put forward more rational aspects such as margin, profit, and convenience while adopting financial services rather than Sharia compliance.

Although this research addresses the policymaking on retaining customer loyalty based on Halal Brand Personality, it has a few limitations. Likewise, this research cannot be generalized because it only focuses on a particular generation, institution, and nation. Thus, it is recommended for further research to expand more generations and Islamic financial institutions as the sample and object, respectively, as well as compare with other nations with similar characteristics to Indonesia to apply the proposed model of this research.

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Factors Determining Indonesian Muslim Behavior in Purchasing Halal Food: A Preliminary Study

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Abstract
Halal food and consumer behavior are hot issues in scholarly publications. However, research exploring the factors determining consumer decisions through exploratory studies is still rare. Therefore, this study aimed to identify the factors determining Indonesian Muslims' purchasing of halal food. We focused on halal food for Muslim consumers and 140 questionnaires were distributed. Exploratory factor analysis and confirmatory factor analysis were used for data analysis. The findings showed that three main factors determine Muslim purchase decisions for halal food: halal awareness, religiosity, and the safety quality of halal food. A novel model of halal food consumer behavior that implies the application of Halalan-tayyibah in Islamic teachings, namely the integration of halalness with product safety and quality. The study also implies that business players must pay attention to halal aspects in all business processes, from manufacturing to marketing, for the halal food value chain to be fully fulfilled.

Keywords:
muslim behavior; halal food; exploratory factor analysis (EFA)

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INTRODUCTION

The topic of halal food is becoming increasingly significant as the worldwide Muslim population grows. Interestingly, even in non-Muslim nations, there has been a shift in behavior and favorable sentiments towards halal food (Damit et al., 2019). This condition demonstrates that the halal products and food market has a significant potential market share. Providing halal food is emerging a new trend in both the consumer and commercial industries (Lada et al., 2009). According to the State of the Global Islamic Economy (SGIE) Report 2022, Indonesian halal food items now rank second out of the top ten in the world, up from fourth the previous year (Dinar Standard, 2022). Indonesian Muslims know the need to purchase halal products (Gojali & Asih, 2020) and halal food (Yasid et al., 2016). Halal is considered a sign of trust, comfort, and safety (Fadholi et al., 2020) because Halal is a principle in Islamic teachings that governs what Muslims are permitted and banned from consuming (Ishak et al., 2020). Thus, a Muslim who consumes must rely on the provisions of Islamic law. Therefore, a study of the decision to purchase halal products must demonstrate the empirical realities of Muslim consumer behavior and halal issues. From a marketing standpoint, it becomes a reference in marketing strategies about providing halal products to Muslim customers. In Indonesia, halal product standards and recognition are provided by the Indonesian Ulema Council (MUI) and are mentioned on the packaging of each product (halal logo).

Prior studies have shown that various variables influence Muslim customers' buying of halal food, including religious factors (Billah et al., 2020; Yasid et al., 2016; Gojali & Asih, 2020); halal certification (Gojali & Asih, 2020); halal label (Nurhasah et al., 2018; Billah et al., 2020); product availability (Hong et al., 2019); health awareness (Nurhasah et al., 2018; Billah et al., 2020); halal awareness (Nurhasah et al., 2018; Gojali & Asih, 2020); attitude (Nurhasah et al., 2018; Gojali & Asih, 2020); brand image (Nurhasah et al., 2018; Antonika et al., 2015); price (Hong et al., 2019); social perception (Gojali & Asih, 2020); self-identity and media exposure (Yasid et al., 2016); reliability and recommendations (Hong et al., 2019); food safety, perceived quality, perceived value, and halal marketing (Nurhasah et al., 2018). Furthermore, non-Muslim consumers' perceptions of halal food products are influenced by attitudes, awareness, and understanding of the concept of halal and food safety towards halal food (Haque et al., 2015). Based on previous findings, it can be said that halal food is also a consideration in the behavior of Muslim and non-Muslim consumers (Maulina et al., 2020; Billah et al., 2020) because the topic of halal food is widespread among Muslim and non-Muslim countries (Secinaro & Calandra, 2021). This data shows that non-Muslim consumers today have a good attitude towards halal food (Damit et al., 2019).

The research findings by Said et al. (2014), Muhamed et al. (2019), and Hosseini et al. (2020) found that religiosity is an essential factor in the behavior of halal food consumers in Malaysia. Suleman et al. (2021) demonstrate that religiosity influences consumer perceptions and behavior regarding buying halal food in Pakistan. Thus, Chinese Muslims' religious commitment is focused on purchasing halal products (Hong et al., 2019). Likewise, religious associations make essential decisions for Muslim consumers

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in China on halal meat (Setiawan & Mauluddi, 2019). In terms of purchase intention, religious factors are also a consideration for consumers to buy a halal food product in Thailand (Billah et al., 2020), in the United Kingdom (Elseidi, 2018), in Pakistan (Awan et al., 2015), in Saudi Arabia (Azam, 2016), in India (Khan et al., 2020), and in Lebanon (Farah, 2021). Thus, religious factors significantly mold consumer attitudes towards halal products (Gojali & Asih, 2020).

Furthermore, safe food has affected Malaysian and non-Muslim purchasing behavior (Lee et al., 2016). In line with research findings by Yang & Huang (2017), the quality, safety, and packaging of Halal food products have a considerable impact on the buying behavior of non-Muslim consumers in China. Similarly, food safety concerns and health awareness impact halal food purchasing behavior in Thailand (Billah et al., 2020) and Malaysia (Ismail et al., 2018). Moreover, trust is a determinant factor in the motivation to consume halal meat in Turkey (Sherwani et al., 2018). Halal certification also plays an essential role in shaping the attitude of Muslims towards halal food in Malaysia (Khalek, 2014). Likewise, Jaiyeoba et al. (2020) claim that the halal certification mark or logo and halal brand quality are essential elements in customers' purchase decisions in Nigeria, and the halal logo has a positive impact on halal food purchasing intention in Thailand (Billah et al., 2020). According to the TPB Model, attitudes affect consumer behavior toward halal food (Abu-Hussin et al., 2017; Damit et al., 2019; Billah et al., 2020; Suleman et al., 2021). In addition, halal awareness has influenced the purchase of halal food in Saudi Arabia (Azam, 2016; Bashir et al., 2019) in South Africa, Fadholi et al. (2020) in Indonesia, and Jaiyeoba et al. (2020) in Nigeria. This aligns with the findings of a literature review by Maulina et al. (2020) and Secinaro and Calandra (2021) that halal awareness is an essential factor in consumer behavior towards halal food.

According to Ajzen (1985, 1991), the TPB model was used to determine Muslim consumers' behavior towards halal food. According to this theory, behavior is determined by attitudes, subjective norms, and perceived behavioral control (beliefs about internal and external barriers that can hinder the behavior from being carried out). Many researchers develop TPB with additional constructs, and religiosity is a construct addition to the TPB for explaining Muslims' behavior (Iranmanesh et al., 2020). Thus, this study investigates the factors that determine purchase behavior towards halal food and demonstrates and validates whether religious concerns are indeed a determining factor in purchase decisions, as stated in a previous study by Muflih & Juliana (2021), Billah et al. (2020), and Maulina et al. (2020) that consumer behavior towards halal food through systematic mapping studies found that the majority of behavioral research related to purchasing intention, consumer perception, perceived value, awareness, willingness to pay, trust, and impulse buying.

Based on previous studies, this study explores what factors influence the use of halal food products, such as research recommendations by Helmyati et al. (2019). The target audience of this research is Muslim consumers who have purchased and used halal food products. This is based on the results of many previous studies, which examined more purchase intention (Maulina et al., 2020) than actual behavior. In addition, previous studies have used more approaches to the TPB (Amalia et al., 2017; Helmyati et al.,

2019; Iranmanesh et al., 2020) and TRA (Lada et al., 2009). However, future research can use intention as an antecedent of halal food purchasing behavior (Ashraf, 2019). Thus, this study aims to explore the actual behavior of Indonesian Muslim consumers when purchasing halal food products.

Furthermore, the findings demonstrate that several factors impact halal food purchasing behavior. Hence, it is crucial to examine the factors influencing Indonesian Muslims' decisions to buy halal food. In order to contribute to the theory of Muslim consumer behavior decisions, particularly consumer purchasing of halal food, this research is preliminary research on the factors determining halal food consumer behavior. The novelty of this research is that factors determining halal food consumer decisions by the exploratory study are still uncommon.

METHODS

This study employed a quantitative method, collecting cross-sectional data through online and offline questionnaire surveys to Muslim consumers of halal food products. The population in this study comprises all Muslim consumers in Indonesia who have purchased halal food products. The sampling technique used purposive sampling with criteria: only Muslim consumers who have purchased halal food products, both halal in substance and those certified as halal by the Indonesian Ulema Council (MUI). Because this research is a preliminary study, the sample size of this study is 10 x 14 indicators (variables) = 140 samples (Muslim consumers).

Based on the findings of previous studies and the characteristics of Indonesian Muslim consumers towards halal food, this research investigation used 14 indicators (variables) to identify the factors that determine Muslim behavior in purchasing halal food, namely obeying the religious rules, religious beliefs affecting overall daily activities, avoiding foods that are not labeled halal, always making sure the product is halal, paying more for food with the halal logo, understanding sharia principles, Muslim-majority neighborhoods, Halal-labelled food is good for consumption, Consuming halal food because of the surrounding environment, selecting food products based on the halal label, Halal food safety confidence Healthy of halal-labeled food products, Halal food according to MUI standards and a good view of the halal restaurant.

This factor analysis is exploratory factor analysis (EFA) type R, and it is used to determine the structure produced from existing elements or to summarise the data included in the original variables into a new set of parameters or factors. As a result, by eliminating 14 observation variables, this research determined the elements of purchasing behavior for halal food from a Muslim perspective. Verify factors using the Keizer-Meyer-Olkin (KMO) and Bartlett test scores. According to Hair et al. (2019), the extraction approach employs principal component analysis with varimax rotation, and the EFA loading factor criterion, as well as the significant factor loading criteria based on sample sizes ranging from 120 to 150, are applied (0.50). So, the factor loading used in this study with a sample size of 140 is 0.5.

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The obtained factor analysis results will be evaluated for validity using the confirmatory factor analysis (CFA) technique using the SEM approach to determine whether an indicator can measure a construct or a factor. The construct validity test was performed using the standard values of average variance extracted (AVE) > 0.5 and construct reliability (CR) > 0.7 according to the Hair et al. (2019) formula, which is as follows:

$$\text{AVE} = \frac{\sum_{i=1}^{n} L_i^2}{n}, \text{ whereas } \text{CR} = \frac{\left(\sum_{i=1}^{n} L_i\right)^2}{\left(\sum_{i=1}^{n} L_i\right)^2 + \left(\sum_{i=1}^{n} e_i\right)}.$$

RESULT AND DISCUSSIONS

Based on the characteristics of the respondents, the bulk of Muslim customers who buy halal food are female (60.00%), while just 40% are male. The average age of respondents, particularly those between 20 and 25 years (76.43%), 26 and 31 years (11.43%), and above 44 years (7.14%), dominates the age range of respondents. This data shows that millennials dominate halal food customers. Table 1 shows the demographics of the respondents in further detail.

Table 1. Respondent demographics

Description	Frequency	Percentage (%)
Gender		
Male	56	40.00
Female	84	60.00
age		
20-25 years	107	76.43
26-31 years	16	11.43
32-37 years	3	2.14
38-43 years	4	2.86
>44 years	10	7,14
education		
Senior high school	79	56.43
Bachelor	54	38.57
Postgraduate	7	5.00
Occupation		
Student	64	45.71
Civil servants (PNS)	22	15.71
not working	9	6.43
Self-employed	15	10.71
Other (not stated)	30	21.43
Income (IDR)		
<1.500.000	84	60.00
1.500.050-3.000.000	26	18.57
3.000.050-4.500.000	17	12.15
>4.500.050	13	9.28

Furthermore, EFA analysis is used to answer the study objectives, which were carried out using a variety of tests such as the KMO value test, Barlett's test, and the MSA test. To be tested, the KMO value of each examined component must be higher than 0.5 and have a significant value of 0.5. Meanwhile, the MSA must be greater than 0.5 (Hair et al., 2019).

Based on Table 2, the KMO value for the analysis of factors that determine Muslim consumers' behavior in halal food is 0.789 or > 0.5, with a significance of 0.000, indicating that the indicator meets the standards for future testing. The MSA value contained in the anti-image correlation then shows the overall value of each indicator of Muslim consumer behavior in purchasing halal food, obtaining a value of MSA > 0.5 where: obeying religious rules (X1), which is 0.918; religious beliefs affect overall daily activities (X2) by 0.742; avoiding foods that are not labelled halal (X3) by 0.749; always making sure the product is halal (X4) by 0.891; paying more for food with the halal logo (X5) by 0.825; understand sharia principles (X6) by 0.864; live in a Muslim-majority neighborhood (X7) by 0.827; halal-labelled food is good for consumption (X8) by 0.818; consuming halal food because of the surrounding environment (X9) by 0.748; selection of halal food based on the halal label (X10) by 0.798; halal food safety confidence (X11) by 0.577; healthy halal-labelled food products (X12) by 0.834; halal food according to MUI standards (X13) by 0.761; and a good view of a halal restaurant (X14) by 0.775, so that the factor analysis can be continued.

Table 2. Results of KMO *and Bartlett's Test*

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.789
Bartlett's Test of Sphericity	Approx. Chi-Square	653.496
	df	91
	Sig.	.000

Furthermore, factor analysis is carried out with principal component analysis (PCA). The first step is to consider the value of commonality. Hair et al. (2019) state that the communality value must be greater than 0.5. The results of the commonalities analysis found that there were four variables whose values were less than 0.5, namely X1 (0.410), X7 (0.420), X9 (0.462), and X14 (0.483). So, all four are removed. After X1, X7, X9, and X14 were removed, all variables had communality values > 0.5 (table 3). However, after continued factor analysis (rotated component matrix), there was a cross-loading on X6, which formed two factors with a value of 0.584 in the first and 0.548 in the second factor, so X6 can be excluded from the factor analysis. However, the commonality value in X5 is found below 0.5, which is 0.463. So, the X5 was removed from the model.

Three general factors are formed based on the component analysis showing the distribution of 8 indicators from the previous 14 indicators. Then, the rotated component

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matrix process is carried out using the varimax rotation method, which allows a more precise and more real factor distribution. So, three factors determine the behavior of Muslim consumers when purchasing halal food. Table 4 shows the summary results of EFA through varimax rotation.

Table 4. Summary Result of EFA (Rotated Component Matrix)

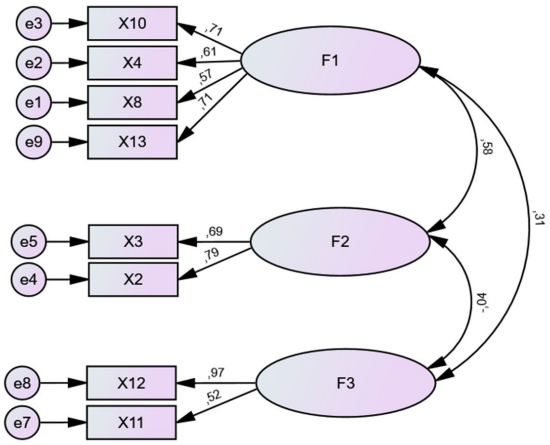
Variable (indicator)	Factor			Communalities
	1	2	3	
Halal-labelled food is good for consumption (X8)	.837			.702
Always make sure the product is halal (X4)	.739			.604
Selection of halal food based on the halal label (X10)	.711			.616
Halal food according to MUI standards (X13)	.537			.547
Religious beliefs affect overall daily activities (X2)		.884		.804
Avoid foods that are not labelled halal (X3)		.809		.699
Halal food safety confidence (X11)			.855	.739
Healthy halal-labelled food products (X12)			.846	.547
Variance	2.125	1.738	1.598	
Percentage of variance (%)	26.561	21.723	19.979	68.263
KMO – Measure of Sampling Adequacy				.678
Bartlett's Test of Sphericity				288.388
Significance of Bartlett's Test of Sphericity				.000

Note: rotated varimax method

Following the reduction of the indicators to three factors as described above, the next step is to name each factor based on the qualities of the indicators that comprise the factor. The factors are then identified as halal awareness, religiosity, and the safety and quality of halal food. The first factor consists of halal-labeled food is good for consumption (X8), always making sure the product is halal (X4), selection of halal food based on the halal label (X10), and halal food according to MUI standards (X13), so this factor can be named "halal awareness". The second factor consists of religious beliefs that affect overall daily activities (X2) and avoiding foods that are not labeled halal (X3), so this factor can be named "religiosity". And the last factor is formed by halal food safety confidence (X11) and healthy halal-labeled food products (X12), so it can be called "safety and quality of halal food."

Furthermore, the validity and reliability of these three factors can be assessed using SEM Amos and the Confirmatory Factor Analysis (CFA) technique with the loading factor criterion > 0.5, AVE > 0.5, and CR > 0.7 (Hair et al., 2019). Based on the validation analysis of these factors, the factorial structure of Muslim consumer behavior towards halal food and the loading factors standard can be seen in Figure 2.

Figure 1. Structure of factor validation



Note: The sample size in the model (n = 140)

Based on the CFA analysis, the validation results of the formed factors can be summarised in Table 5. Figure 2 and Table 5 illustrate that each constructed factor has an average factor loading value of more than 0.5 and Cronbach's alpha reliability greater than 0.6. However, in terms of AVE, one element has a value less than 0.5, namely factor 1. However, it is still maintained since the loading factor has a value greater than 0.5, Cronbach's alpha is more significant than 0.7 (0.746), and the CR value is more significant than 0.5 (0.884). These results indicate that the factors that determine the behavior of Muslim consumers in purchasing halal food have good reliability with a Cronbach's alpha value > 0.7, and the correlation of each indicator item to the total factor is all above 0.5. Thus, the indicators that make up these factors are declared valid and reliable to measure the behavior of Muslim consumers in purchasing halal food.

Table 5. Construct validity and reliability tests

Construct	Mean	Std. dev	F-loading	Cronbach	AVE	CR
Halal awareness				**0.746**	**0.426**	**0.884**
X8	4.429	0.648	0.568			
X4	4.307	0.667	0.61			
X10	4.079	0.563	0.714			
X13	4.279	0.588	0.708			
Religiosity				**0.700**	**0.556**	**0.795**
X2	4.543	0.528	0.749			
X3	4.243	0.656	0.694			
Safety & quality of halal food				**0.670**	**0.608**	**0.900**
X11	4.193	0.561	0.519			
X12	4.436	0.590	0.973			

Based on the preceding investigation's main findings, three factors determine Indonesian Muslim customers' purchase of halal food. As assessed by a favorable attitude,

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concern for the halal concept will influence behavior in consuming or purchasing halal items. Halal awareness is a conscious condition in which a Muslim knows what is halal, understands the proper slaughtering method, and prioritizes halal food for eating (Awan et al., 2015). Halal awareness is vital in understanding health and safety, influencing non-Muslim consumers' choice to buy halal food products (Bashir, 2020). This condition aligns with the fact that awareness of the halal principle influences Muslim and non-Muslim Malaysians' purchasing intentions for halal food (Lee et al., 2016). Thus, awareness of halal has an impact on halal food purchasing (Azam, 2016).

Similarly, regarding halal awareness and halal food purchase intentions, our findings demonstrate that halal awareness determines halal food purchasing decisions. In line with the finding by Muslichah et al. (2020), awareness of halal food significantly impacts purchasing decisions for halal food. Despite the findings by Jaiyeoba et al. (2020) that halal awareness has no significant impact on halal product purchasing decisions in general, halal awareness is also driven by religiosity because religious beliefs influence Muslim customers' awareness of halal food (Yasid et al., 2016). Thus, religiosity positively moderates the relationship between awareness and halal food purchasing decisions (Muslichah et al., 2020). Based on the literature review, one of the literature clusters on halal food is the relationship between awareness and halal food (Secinaro & Calandra, 2021). Therefore, the higher one's religious life, the higher the awareness of buying and consuming halal food.

Even though our study shows that halal awareness is related to the halal label (logo) based on MUI standards, halal awareness regarding halal labels is an implementation of the religiosity of a Muslim consumer. This condition shows that Muslim awareness of the need to consume halal food comes from respecting religion (Secinaro & Calandra, 2021). This fact further clarifies the literature showing that religiosity influences purchasing decisions for halal food and can also moderate halal awareness towards purchasing decisions.

Based on the results above, our findings illustrate that religious beliefs influence a Muslim's daily behaviors, including purchasing Halal food. Religiosity contributes essentially to shaping the behavior of Muslim consumers in choosing halal products (Gojali & Asih, 2020). In Islam, a Muslim must prioritize religious prohibitions on consumption and pay attention to the halal elements of a product. Previous research findings showed that religious factors influence a person's decision to buy halal food products, such as the findings by Hong et al. (2019) that Tionghoa Muslims have religious loyalty and pay attention to halal product ingredients when buying. Religious value (halal concern) was the most significant factor in determining purchasing behavior for halal food products (Muhamed et al., 2019). Religiosity is crucial in consumer purchase intention (Farah, 2021). Likewise, on the halal label (halal logo), religious beliefs are more clearly indicated by halal-certified food (halal logo) by the MUI. This means the halal logo affects buying behavior and consumer loyalty (Quoquab et al., 2020). This result aligns with the findings by Jaiyeoba et al. (2020) that halal certification marks are the most influential factors contributing to consumers' buying decisions. Food labels (the halal logo) influenced consumers' attitudes toward consumer purchasing behavior (Abdul Latiff et al., 2016).

Based on the findings above, it can be explained that religious factors greatly determine the behavior of Muslim consumers in buying halal food products because Muslim religiosity has positively correlated with halal importance (Ijaz, 2022). Suppose the behavior of consumers is the desire to buy. In that case, religious commitment positively affects the willingness to pay for halal food (Hosseini et al., 2020). The actual behavior of religiosity positively moderates the relationship between awareness and halal food purchasing decisions (Muslichah et al., 2020), and even the consumption of halal food mediates the relationship between religiosity and physical well-being (Suleman et al., 2021). On the other hand, religion/spirituality has become a more important topic in enterprises (Raco et al., 2019). This condition shows that religion has influenced personal characteristics in social and economic behavior (Rietveld & van Burg, 2014). Hence, the religiosity factor becomes an essential factor in the behavior of Muslim consumers towards purchasing decisions of a product.

Based on the study's results, halal products' safety and quality shape decision-making behavior in purchasing halal food. This study is in line with Secinaro & Calandra (2021) that one of the factors Muslims consider in using halal products is the safety and quality of halal food. This result means that product quality, other than religious factors, is an essential factor that is considered in the behavior of consumers of halal food products. The safety and health of halal-labeled products have positive and significant implications for Muslim consumers' attitudes towards these halal-labeled products. Food safety concerns and health consciousness positively influence buying halal food products (Elseidi, 2018). Food safety concerns and health consciousness positively influence buying halal food products (Billah et al., 2020), and food quality also positively affect the willingness to pay for halal food (Hosseini et al., 2020).

In addition, halal food has become a consideration in the behavior of Muslim and non-Muslim consumers (Maulina et al., 2020; Billah et al., 2020). The attitude towards halal food of non-Muslim consumers influences the repurchase intention (Damit et al., 2019). Safety food also contributes to Muslim and non-Muslim Malaysians' intentions to purchase halal food (Lee et al., 2016). Also, the quality and safety of halal food products significantly impact the buying behavior of non-Muslim consumers in China (Yang & Huang, 2017). Therefore, companies need to pay attention to Islamic principles, especially the safety and integrity of halal food, in every process of producing and marketing halal food (Secinaro & Calandra, 2021). Because Muslim consumers with religious beliefs insist on ensuring that their products are not "haram" and contain unclean ingredients, they are safe from disease and maintain their health. This condition is referred to in the Qur'an as the concept of "halalan tayyibah" (halal and suitable), which means that apart from being halal according to Islam, the product must be reasonable and healthy for consumption. Halal-labeled food must reflect the concepts of Halal and Tayyib, Halal as a subject, and Tayyib as a process, simplifying the Halal certification procedure. The main goal of Tayyib is to produce clean and pure food, which can be achieved if the food is produced according to Islamic principles (Alzeer et al., 2018).

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CONCLUSION

Based on the study's findings, three major factors determine Indonesian Muslims' purchasing decisions for halal food items: halal awareness, religiosity, and the safety and quality of halal food products. This result demonstrates that Indonesian Muslim customers are already halal-conscious in purchasing food products, demonstrating the implementation of Islamic teachings regarding the commandment of halalan-tayyibah. This result demonstrates that halal awareness manifests itself in purchase intentions and actual behavior towards halal food products. Likewise, religiosity, safety, and quality of halal food are essential factors for Muslim consumers in purchasing halal food, especially certified halal food. This result conforms with the Qur'anic requirement that every Muslim must pay attention to Islamic principles in consumption, which is referred to as halalan-tayyibah in the Qur'an (lawful and good). The study also proves that religiosity is an important factor influencing Muslim consumers' behavior in purchasing halal food products.

The finding contributes to the development of Islamic consumer behavior theories and models and managerial implications in developing the halal product industry and halal food. This study provides a preliminary examination of the factors determining Muslim consumers' buying of halal food products. Likewise, business actors need to pay attention to the halal element in every halal food business process, from production to marketing, to realize the halal food value chain. The policy implication of the study is that the government needs to encourage and provide convenient services for the halal industry and SMEs in halal certification to create a halal ecosystem and strengthen the global Islamic economy. Because Indonesian halal food is ranked second in the world, integrating halal safety food and halal certification policies is essential for developing the Indonesian halal food industry.

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Intentions to Consume Sustainable Fashion Products in Indonesia: Does Religiosity Affect?

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Abstract
Religiosity is expected to be a positive driving factor of consumption demand for environmentally friendly fashion products. However, few studies have been found that focus on consumer behavior in purchasing sustainable fashion, and none use religiosity as an explanatory variable. This study, therefore, is the first to analyze the effect of religiosity on the intention to consume sustainable fashion products. This study used a quantitative approach with the Structural Equation Modelling (SEM) analysis method and involved 522 respondents in Indonesia. By adopting the theory of planned behavior model, the study results show that religiosity significantly positively affects purchase intentions of sustainable fashion products through the variables' attitude towards behavior and perceived behavioral control. At the same time, the green thinking variable also has a positive impact, but altruism is irrelevant to sustainable fashion consumption. These results indicate that if the consumer is religious, this can lead to a better environmentally friendly attitude and result in a tendency to consume sustainable fashion products.

Keywords:
consumer behavior; environment; religiosity; sustainable fashion; theory of planned behavior

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INTRODUCTION

A novel coronavirus was eventually identified in Wuhan, Hubei Province in China, in late December 2019. The International Committee on Taxonomy of Viruses (ICTV) termed the virus the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), while the World Health Organization (WHO) named the disease as the coronavirus disease 2019 (COVID-19) (Cui, 2019; Lai et al., 2020a; WHO, 2020). COVID-19 is a highly contagious disease caused by a strain of coronavirus known to cause respiratory infections in humans, which can transfer through communities more swiftly than the methodical pace of science can produce vital answers (Harrington et al., 2021). COVID-19 is thought to spread mainly through person-to-person close contact when a person touches their eyes, nose, or mouth after touching a surface or object that the coronavirus has contaminated. Thus, this pandemic has been declared a global health emergency and has caused an unprecedented human and health crisis.

The problem of negative externalities overshadows the development of the fashion industry, which is proliferating in the 21st century. The UN Partnership on Sustainable Fashion and The SDGs conference report stated that behind the contribution of up to $ 2.4 trillion to global manufacturing and employing around 300 million people worldwide, the fashion industry also produces nearly 20% of wastewater (UNECE, 2018). Globally, the fashion industry also emits around 10% of carbon emissions (this exceeds the combined emissions of all international flights and sea shipping). It produces greenhouse gas emissions of around 2.1 billion metric tons in 2018, or the equivalent of 4% of total greenhouse gases globally (Global Fashion Agenda and McKinsey & Company, 2020). In addition, the fashion industry has recently been identified as a major contributor to plastic waste entering the sea.

Facts about the rapid increase in the fashion industry and its environmental side effects also occur in Indonesia. According to the Oxford Business Group (2014), Indonesia produced 439 billion tons of viscose fiber, and is predicted to increase to 464 billion tons in 2017. This condition was reinforced by the Indonesia Ministry of Industry, which states that in 2030, the export value of Indonesian textiles and textile products is projected to increase by 100% to US$ 26 billion from 2018, which was valued at US$ 13 billion (Ministry of Industrial, 2018). According to Sax (2018) and Qoriyanti (2019), Indonesia is one of the countries contributing to environmental pollution due to the rapid growth of the fashion industry. With export volumes approaching $8 billion in 2020 and a workforce of nearly 2 million people, the Indonesian garment and textile industry has become one of the top 10 garment exporters in the world (Fashion United, 2022).

As a country with the most significant number of Muslims worldwide and whose citizens must have religion, the above situation is essential for further analysis, especially on the consumer side. This is because religious values significantly influence consumer behavior (Ahmad et al., 2015; Madni et al., 2016). Religion is expected to be a positive driving factor for consumption demand for environmentally friendly fashion products, not the other way around. This condition means that the fashion industry's impact on the environment should be positive when consumer demand, which is driven by religious

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factors, really wants it. Most Gen Z and Indonesian Millennials, who make up more than half of the total population, think that religious values are a guideline for their lives and become boundaries that govern behavior and perspectives. They are also willing to pay more for environmentally friendly products (IDN Research Institute, 2022a, 2022b).

In Islam, Muslims must consume halal goods and food and be oriented towards maslahah or mutual benefit (Hasan & Lahar, 2011; Khan, 1995, 2013). One form of implementation of this concept is to meet the need for environmentally friendly or sustainable (sustainable fashion) clothing. Not only in Islam, Christianity, Buddhism, and Hinduism also have pro-environmental teaching values (Wang et al., 2020). James (2004) states that Buddhists and Hindus have a pantheistic view that God is in and through everything, including nature, so destroying an element of nature is the same as destroying a part of God (Hunt & Penwell, 2008; Sarre, 1995). Therefore, Buddhism and Hinduism have a teaching value to participate more in environmentally friendly efforts. According to Calvin B. DeWitt in Hodson & Hodson (2017), Christianity has principles of environmental management following the Bible, which include maintaining the environment, sabbath, and fertility (Hodson & Hodson, 2017). These three principles constitute an ethic that promotes sustainable management of nature while enabling a balance between humans and the environment.

The concept of sustainable fashion, first developed in 1972 at the UN Conference, is considered a solution to address environmental problems caused by the fashion industry (Shen et al., 2013). The vision of sustainable fashion is that it aligns with the principles of the circular economy: restorative and regenerative by design and benefits the economy, society, and the environment (Ellen Mac Arthur Foundation, 2017). Therefore, according to Fischer et al. (2017) and Razzaq (2018), consumption of sustainable fashion is needed to obtain, use, and dispose of clothing that does not endanger the ecological and socio-economic conditions for the present and the future.

The concept of sustainable products, especially in fashion, a form of implementation of the SDGs concept, is a movement and process of encouraging changes in fashion products and production systems towards integrity with the environment and greater social justice (Fischer, 2008). This condition, in practice, is focused on textiles or fashion products and on the entire production output carried out by the industry. Henninger et al. (2016) explained that there are five basic principles that companies must meet in producing sustainable fashion, namely ethical or sustainable design, promoting trade and fair wages, continuously checking whether harmful substances exist, meeting good environmental standards, and enforcing worker rights. If all of these things are met, then the goals of sustainable fashion can be achieved, namely increasing the value of local production and products, extending the material life cycle, increasing the value of timeless clothing, reducing the amount of waste, and reducing environmental damage due to production and consumption (Brown, 2010).

So far, only a few studies have been found that focus on consumer behavior in purchasing sustainable fashion, including those conducted by Brandao & Costa (2021) and Bianchi & Gonzalez (2021). Brandao and Costa (2021) conducted their research in

Europe, Asia, and North America using the theory of planned behavior as the basic model and as a mediator for other variables of purchase intention. They found that product attributes and variety and environmental apparel knowledge were the variables that had the most significant positive effect on the components of the theory of planned behavior that build purchase intentions for sustainable fashion. Bianchi and Gonzalez (2021) conducted a similar study using a qualitative approach in the form of in-depth interviews in Chile. Four factors were found to be driving reasons for consuming sustainable fashion: concern for the fashion industry's negative impact, feeling good about contributing to a better life in the world, the authenticity of sustainable fashion, and supporting local businesses and workers.

Meanwhile, several studies regarding sustainable products or environmentally friendly products in general, not specifically for fashion products, have been conducted by, for example, Teng et al. (2013). They researched the role of altruism and the Theory of Planned Behavior (TPB) on people's intention to use green hotels in China. The study found that altruism and indicators of the TPB had a significant positive effect on the behavior intention to use green hotels. The same research was also conducted by Chaudhary & Bisai (2018) in India by adding variables and purchase behavior as an extension of purchase intention in TPB, which was not used by Teng et al. This study found that purchase intention and perceived behavioral control significantly positively affected purchase behavior. In Indonesia, Sutikno et al. (2020) conducted similar research by using TPB for the purchase intention of environmentally friendly products. It was found that attitude towards behavior and subjective norms significantly positively affected purchase intention.

In contrast to previous studies where most of them used the standard TPB model, research conducted by Ali et al. (2020) found that intrinsic motivation, such as green thinking and (green) altruism, is the variable that has the most significant positive effect on green product purchasing intention. This result aligns with the findings of Hughner et al. (2007), who found that positive thinking about environmentally friendly labels creates a positive assessment of these environmentally friendly products. Consumers tend to look rationally at the perceived benefits of environmentally friendly products in accordance with their motives when deciding to buy them (Hahnel et al., 2014). In addition, altruistic consumers are more likely to act to choose ecological benefits rather than just for their benefit (Gueguen & Stefan, 2014).

Regarding religiosity, so far, no research has been found using this variable to see its effect on sustainable fashion consumption. However, Suki and Suki (2015) found that the consumption of green food in Malaysia is influenced by aspects of religiosity, especially for Muslim consumers, while non-Muslim consumers see the importance of green products because of the importance of environmental values from a personal perspective. The use of religiosity variables was also carried out by Wang et al. (2020) to see their impact on environmentally friendly products. They used the TPB model and added the religiosity variable in their research to see a person's purchasing intention in using green hotels in China. The study found that religiosity significantly positively

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affects all SDG indicators and green purchasing intention. The importance of the role of religion in influencing consumer behavior, as stated earlier, is in line with research findings that religion plays a very significant role in influencing consumer behavior (Ahmad et al., 2015; Madni et al., 2016) because consumers show their (religious) beliefs through their consumption choices (Lari et al., 2019).

From the brief description above, research on consumer behavior toward the consumption or purchase of eco-friendly fashion is minimal. Existing research has yet to include the religious variable as an indicator that is important in influencing consumer behavior. Because of this, this research is the first to examine the impact of religious influences on purchase intentions for sustainable fashion products. By considering the characteristics of Indonesian people with environmental concerns, this research will also include motivational variables in the form of green thinking and altruism in the analysis.

METHODS

This research was conducted using the basic model of TPB. TPB, the theory of planned behavior, is an extension of TRA or the theory of reasoned action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). The TPB was created because of the limitations of the TRA model in dealing with behaviors where people have incomplete volitional control. As in TRA, the main factor that determines specific behavior is the presence of individual intentions. Intentions are assumed to know the motivational factors that influence behavior; it includes how hard a person is willing to try and how much effort they plan to put into carrying out the behavior.

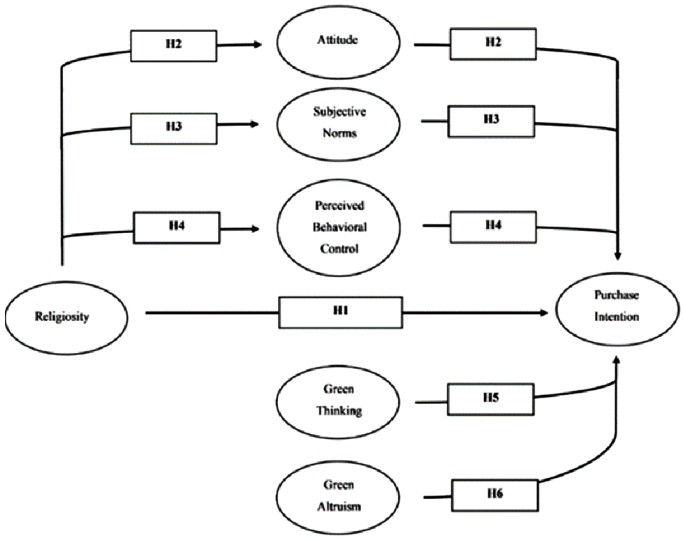
In TPB, three indicators determine a person's intention (Ajzen, 1991). First, attitude towards behavior refers to the extent to which a person has beliefs about specific behaviors and their consequences. Second, social factors are referred to as subjective norms. These are normative expectations from others who are considered essential to do or not to do a behavior. Third, perceived behavioral control refers to the ease or difficulty a person feels in carrying out a behavior and is assumed to reflect experience and anticipated obstacles. The TPB model used in this study does not extend to buying behavior but to the intention to use sustainable fashion.

The sampling method used here is purposive sampling, which is a sampling technique with specific considerations that aim to make the data obtained based on specific criteria so that it can support the achievement of research objectives (Malhotra & Dash, 2016). The sample criteria used in this study are: 1. Indonesian citizens and domiciled in Indonesia; 2. Have heard or know about the terms sustainable fashion or eco-fashion; 3. Have never bought sustainable fashion or eco-fashion products.

This study combines research conducted by Wang et al. (2020) which includes religiosity variables, and Ali (2020), which uses green thinking and altruism variables in the TPB model. As described in the previous section, religiosity values serve as guidelines for an individual in behaving and acting in the surrounding environment and how they utilize existing resources (Shiddiqi, 2000; Ahmad et al., 2015; Madni et al.,

2016; Wang et al., 2020; IDN Research Institute, 2022a). Therefore, apart from directly influencing consumer intentions, it is suspected that there is also a relationship where religiosity is mediated by attitude variables, subjective norms, and perceived behavioral control in the intention to purchase sustainable fashion products. Meanwhile, consumer cognitive abilities such as green thinking and altruism directly create positive evaluations of environmentally friendly products, so it can be said to have a positive relationship with sustainable fashion purchase intentions. Therefore, this research model can be seen in Figure 1.

Figure 1. Research Model



Sources: Ali (2020) and Wang et al. (2020); Modified by the Author

The initial stages of this research were carried out by pre-testing the questionnaire, which helps check whether the questionnaire is suitable for research through wording, validity, and reliability tests. Questionnaires were distributed online using the Google Form survey application. Online surveys have several advantages, namely being able to reach a broader area in a short time, being more cost-effective, and being able to see the quality of responses by respondents, the quality of data that can be seen from validity tests, and so on (Malhotra & Birks, 2007). Respondents will fill out a questionnaire regarding the theory of planned behavior, green thinking, green altruism, religiosity, and intention to buy sustainable fashion items. This questionnaire was prepared using a Likert scale of 1-6 with a value of (1) for "Strongly Disagree" to (6) "Strongly Agree".

After that, the research continued to the primary test using analytical techniques or Structural Equation Modeling (SEM) methods. SEM is an analytical technique that describes the path of the relationship between several latent variables and examines the dependency relationship between these variables (Hair et al., 2010). Latent variables themselves reflect variables that are abstract or cannot be assessed directly but are measured using observable variables.

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There are two models in the SEM method, namely the measurement model and the structural model. The measurement model represents how much the indicator/ questionnaire question/observed variable represents the latent variable (Wijanto, 2008). This model helps prove that the observed variable reflects the latent variable. The form of testing in the analysis of this model consists of at least a reliability test and a validity test. Meanwhile, the structural model examines the relationship between research latent variables and the estimated coefficients' significance (Wijanto, 2008). Testing this structural model is vital to see the causal relationship analysis tests.

RESULT AND DISCUSSION

The total sample obtained in this study was 522 respondents. This sample size meets the minimum size required, where, according to Loehlin (1998), the minimum sample size required to reduce bias in all types of SEM estimation is 200 respondents. Based on the data obtained, the background variations of respondents covered all recognized religions in Indonesia. Most respondents were Muslim, with 446 respondents or 87%, followed by Christian respondents with 28 respondents or 6%, and the rest were Catholic, Hindu, Buddhist, and others. The proportion of respondents' distribution is sufficient to represent the religious population in Indonesia, where the majority of the population in Indonesia adhere to Islam, followed by Christianity and other religions.

Table 1. Validity and Reliability Pre-Test

Latent Variable	KMO	*Cronbach's Alpha*	Interpretation
Green Thinking	0,621	0,602	Valid & Reliable
Green Altruism	0,699	0,602	Valid & Reliable
Religiosity	0,779	0,906	Valid & Reliable
Attitude Towards Behavior	0,744	0,803	Valid & Reliable
Subjective Norms	0,501	0,607	Valid & Reliable
Perceived Behavioral Control	0,527	0,727	Valid & Reliable
Purchase Intention	0,695	0,880	Valid & Reliable

Source: Data processed (2023)

The results of the validity and reliability test can be seen in Table 1 below. According to Malhotra & Dash (2016) and Hair et al. (2019), an indicator is declared valid and feasible if it has a Kaiser-Meyer-Olkin (KMO) value and a factor loading value on the component both of ≥ 0.5. Based on the following table, all latent variables in this study are valid on the Kaiser-Meyer-Olkin (KMO) validity criteria because all variables fulfill a value of ≥ 0.5. Meanwhile, according to Malhotra & Dash (2016), indicators in the research questionnaire are considered reliable and consistent if they have a Cronbach's Alpha value of ≥ 0.6. It can be seen that all latent variables in this study are reliable because Cronbach's alpha value of all variables fulfills a value of ≥ 0.6.

The results obtained were that all variables, except for the subjective norm, received very high responses, namely an average >5. Purchase intention is a variable that contains the highest average answer value with a value of 5.31, which indicates that respondents will try, intend, plan, and are willing to own or consume sustainable fashion items in the future. While the lowest answer is in the subjective norm variable with an average respondent value of 4.68. This indicates that respondents do not really feel the influence of those closest to them in consuming sustainable fashion goods. While the religiosity variable gets an average value of 5.16, thus indicating the importance of considering the role of religion in building respondents' intentions to consume sustainable fashion.

Table 2. Descriptive Statistics of Latent Variables

Variable	Indicator	N	Min	Max	Mean	
					Indicator	Variable
Green Thinking	GT1	522	2	6	5.04	5.21
	GT2	522	2	6	5,28	
	GT3	522	2	6	5.31	
Green Altruism	GA1	522	1	6	5.07	5.17
	GA2	522	1	6	5.15	
	GA3	522	1	6	5.10	
	GA4	522	1	6	5.35	
Religiosity	RE1	522	1	6	4.87	5.16
	RE2	522	1	6	5.01	
	RE3	522	1	6	5.38	
	RE4	522	1	6	5.22	
	RE5	522	1	6	5.28	
	RE6	522	1	6	5.21	
Attitude Towards Behavior	AT1	522	1	6	5.41	5.22
	AT2	522	1	6	5.35	
	AT3	522	1	6	5.11	
	AT4	522	1	6	5.47	
	AT5	522	1	6	5.04	
	AT6	522	1	6	5.01	
	AT7	522	1	6	5.13	
Subjective Norms	SN1	522	1	6	4.42	4.68
	SN2	522	1	6	5.15	
	SN3	522	1	6	4.46	
Perceived Behavioral Control	PBC1	522	1	6	5.36	5.08
	PBC2	522	1	6	5.03	
	PBC3	522	1	6	4.84	
Purchase Intention	PI1	522	1	6	5.20	5.31
	PI2	522	1	6	5.32	
	PI3	522	1	6	5.33	
	PI4	522	1	6	5.39	

Source: Data processed (2023)

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After passing the pre-test questionnaires, the research can proceed to the primary test of the SEM analysis technique. Based on a series of tests from the SEM measurement model, it can be seen that all indicators of latent variables have passed the validity test, and all tested variables fulfill the reliability aspects, as presented in Table 3. All indicators are declared valid because the t-value is ≥ 1.645 and the SLF value of ≥ 0.5 (Wijanto, 2008), while the reliability aspect of the variable is fulfilled because the parameters Construct Reliability (CR) ≥ 0.6 and Variance Extracted (VE) ≥ 0.5 (Wijanto, 2008).

Table 3. Validity and Reliability Variabels of Measurement Model

Variable	Indicator	SLF	t-value	CR	VE	Interpretation
Green Thinking	GT1	0.68	20.07	0.82	0.51	Valid & Reliable
	GT2	0.63	20.40			
	GT3	0.59	19.37			
Green Altruism	GA1	0.76	21.93	0.90	0.69	Valid & Reliable
	GA2	0.84	25.93			
	GA3	0.90	25.83			
	GA4	0.67	18.97			
Religiosity	RE1	0.89	19.63	0.93	0.72	Valid & Reliable
	RE2	0.80	20.24			
	RE3	0.87	25.09			
	RE4	0.95	27.80			
	RE5	0.89	24.57			
	RE6	0.83	21.99			
Attitude Towards Behavior	AT1	0.69	21.51	0.93	0.63	Valid & Reliable
	AT2	0.80	23.93			
	AT3	0.82	22.99			
	AT4	0.72	21.67			
	AT5	0.85	23.11			
	AT6	0.79	19.68			
	AT7	0.73	19.78			
Subjective Norms	SN1	1.11	22.83	0.84	0.58	Valid & Reliable
	SN2	0.50	12.63			
	SN3	1.09	23.98			
Perceived Behavioral Control	PBC1	0.52	15.86	0.81	0.55	Valid & Reliable
	PBC2	0.85	22.52			
	PBC3	0.86	19.98			
Purchase Intention	PI1	0.73	23.36	0.91	0.69	Valid & Reliable
	PI2	0.73	25.03			
	PI3	0.62	21.97			
	PI4	0.62	22.56			

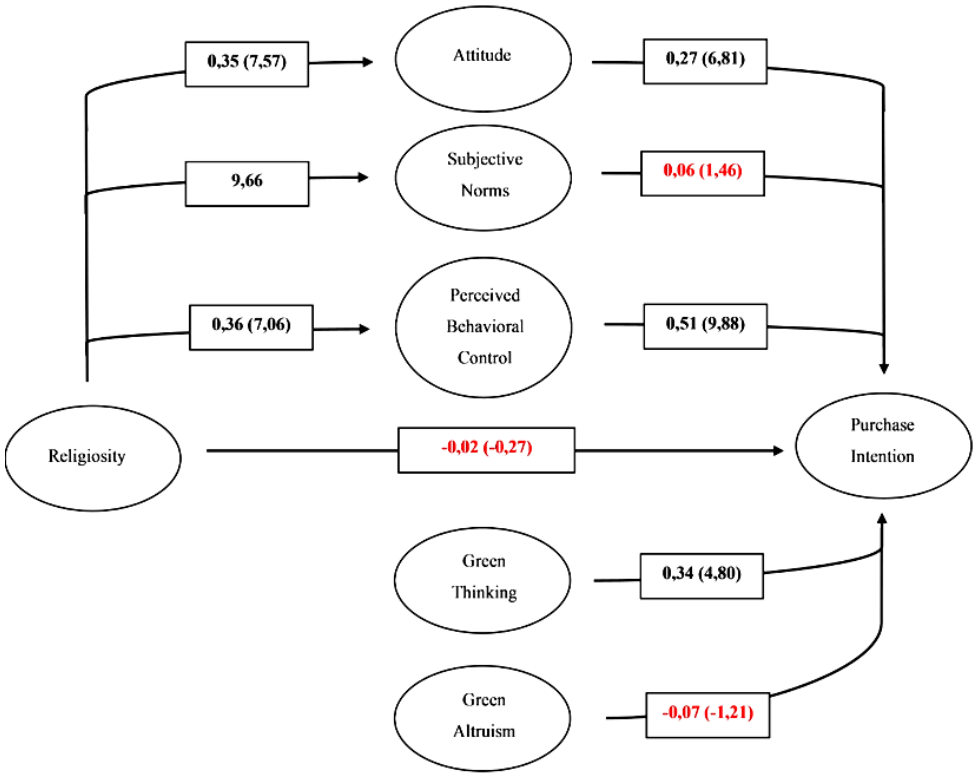
Source: Data processed (2023)

The structural model, which aims to see the significance of the direct relationship between latent variables, can be seen in Figure 2 on the results of Standardized Loading

Factors (SLF) values and t-values (in brackets). A latent variable can be said to be significant if the t-value is ≥ 1.645 or ≤ 1.645, while the estimated coefficient value of SLF indicates the magnitude of the effect. SLF is also helpful for showing the direction of positive or negative relationships of latent variables to other variables. Based on the test results, it can be seen that the t-value of the relationship between religiosity and purchase intention is below the minimum limit, as well as subjective norms and green altruism, so it can be concluded that the relationship between these variables is not significant.

However, it was found that the religiosity variable positively affected the attitude towards behavior variable, subjective norms, and perceived behavioral control. In addition, there was also a positive effect on purchase intention from the variable's attitude towards behavior, perceived behavioral control, green thinking, and green altruism, while subjective norms were not significant. This condition indicates that the mediating variable from religiosity to purchase intention through attitude towards behavior and perceived behavioral control has a significant effect, while subjective norms are not proven. Meanwhile, the relationship path of the religiosity variable to purchase intention is insignificant. Thus, according to Hair et al. (2019), this is categorized as complete mediation. The entire mediation category is fulfilled if the direct effect (religiosity variable on the purchase intention variable) proves insignificant and the indirect effect (religiosity variable on the two variables above) proves significant.

Figure 2. SLF and t-values of Structural Model



Source: Data processed (2023)

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Based on a series of processing and analysis using the SEM method as well as the mediation analysis that has been carried out, the results show that there is an influence of religiosity on the purchase intention of sustainable fashion products through attitude towards behavior, as evidenced by the presence of full mediation between the three variables. The findings of the variable path are in line with research that has been conducted by Wang et al. (2020), Sutikno et al. (2020), and Chaudhary & Bisai (2018). Sutikno et al. (2020) also found that the attitude towards behavior variable has the most substantial influence compared to other variables on the purchase intention of "green" goods.

Attitude towards behavior refers to the extent to which a person has a favorable or unfavorable assessment of the behavior. So when someone believes that values in religion are something good, this will have good consequences in all activities, including consuming sustainable or environmentally friendly fashion. This condition is confirmed by table 2, which shows the high average of respondents' answers on the religiosity variable, which is equal to 5.16, and the attitude towards behavior variable is equal to 5.22, so the majority of respondents recognize themselves as religious figures, and this is believed to provide kindness. Therefore, it can be concluded that if the respondent is a religious person, this can lead to a better environmentally friendly attitude and result in a tendency to intend to consume sustainable fashion products.

Furthermore, it is also proven that there is a significant positive relationship between the religiosity variable and purchase intention through the perceived behavioral control variable. Perceived behavioral control is the perceived ease of behavior based on past experiences and obstacles that can be anticipated. This means that the existence of religion will facilitate someone's interest in buying sustainable fashion products. Wang et al. (2020) and Chaudhary & Bisai (2018) had the same results that most religious respondents tended to consume or buy green products easily. A high average score of respondents' answers, which is equal to 5.08, indicates that the majority of respondents strongly agree that they find it easy to consume or buy sustainable fashion products.

The PBC1 indicator was found to have an average value of the respondents' answers of 5.36, followed by the PBC2 indicator of 5.03. These two indicators indicate that most respondents agree that they believe they can own or consume sustainable fashion products. These findings align with the results of the Indonesia Gen Z Report 2022 and Indonesia Millennial Report 2022, which say that Gen Z and Indonesian Millennials want to unleash their ability to consume environmentally friendly products. Then, it can also be seen that there is a relationship that has a significant positive effect from the green thinking variable to the purchase intention variable, which is in line with previous research by Ali et al. (2020) and Liu et al. (2017) in the context of China and the United States. Ali et al. (2020) argue that this is driven by the growing awareness among consumers in China regarding environmental issues, thus showing a tendency and concern about how to overcome environmental damage with their "green" initiatives and behaviors. In the Indonesian context, these findings are in line with the results of the Indonesia Gen Z Report 2022 and Indonesia Millennial Report 2022, which say

that the majority of Gen Z and Millennials in Indonesia have good knowledge related to environmental friendliness or climate change (IDN Research Institute, 2022a; IDN Research Institute, 2022b).

CONCLUSION

Although not directly affected, the study results show that religiosity significantly positively affects purchase intention in consuming sustainable fashion products through the variables' attitude towards behavior and perceived behavioral control. One's religiousness does not directly lead to a desire to consume sustainable fashion products. However, the existence of these religious values can lead to a better environmentally friendly attitude. It will ultimately result in a tendency to intend to consume these products. Green thinking also has a significant positive effect on purchase intention in consuming sustainable fashion products. In contrast, the altruism variable does not significantly affect purchase intention in consuming sustainable fashion products. The findings indicate that if respondents know about caring for the environment, they tend to buy sustainable fashion products.

The results of this research provide fundamental theoretical and practical implications. The results of this research can be a foundation for using the religiosity variable in studying consumer behavior in purchasing environmentally oriented products. Exploring religious factors in research is very important, especially in religious countries, considering that it is still rarely used in the theory of planned behavior. Meanwhile, the practical impact is that fashion companies can run pro-environmental product campaigns, potentially creating a segment of society with a favorable view of environmentally friendly products, especially religious communities. Another effort that companies can make is to increase green consumerism by promoting or providing environmental education programs and green certification related to ecological symbols and concepts.

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Appendix

Operational Definition of Variables and Indicators in the Research Questionnaire

Variable	Operational Definition	Indicator	Source
Green Thinking	Green thinking is an awareness of our connectedness to the world and reflects the unintended harm we cause to nature in our daily lives (The Environmental Action Alliance, 2004).	GT 1. I am a person who is very concerned about the environment GT 2. Environmental conditions make me think about the quality of my life GT 3. I am willing to find ways to protect the environment	Ali et al (2020)
Green Altruism	Green altruism is a strong cognitive ability and tends to be more careful in making decisions and actions after the emergence of environmental problems that have developed recently (Wu et al., 2016; Jones, 2019; Ali et al., 2020).	GA 1. By purchasing environmentally friendly products, I feel I have fulfilled some of my obligations to society GA 2. By buying eco-friendly products, I feel I have done something to help other people's lives GA 3. By buying eco-friendly products, I feel I have done something to protect the lives of others GA 4. If everyone (who can afford to buy eco-friendly products) chose to buy those products, I believe the world would be a better place	Ali et al (2020)
Religiosity	Religiosity is a belief in God that is accompanied by a commitment to follow the principles believed to be established by God (McDaniel & Burnett, 1990)	RE 1. I often read reading material related to the religion I follow RE 2. I take the time to try to increase my faith/ understanding of the religion that I profess RE 3. Religion is very important to me because its presence can answer many questions about the meaning of life RE 4. The whole approach I take in my life is based on the belief in the religion I follow RE 5. My belief in religion can affect all matters in my life RE 6. Taking time to think and reflect on my own religiosity is important to me	Wang et al (2020)
Attitude Towards Behavior	Attitude towards behavior is a person's positive or negative feelings about carrying out a behavior are determined by a person's main belief (behavioral beliefs) that the behavior leads to certain results (Ajzen, 1991)	For me, consuming the sustainable fashion product is: AT 1. Bad thing – good thing AT 2. Stupid choice – wise choice AT 3. The unpleasant – The pleasant AT 4. The negative – the positive AT 5. Does not give me satisfaction – can give me satisfaction AT 6. Unfavorable choice – profitable choice AT 7. Things I don't want – Things I do want	Jain et al. (2017)
Subjective Norms	Subjective norms is a person's behavior that can be influenced by social pressure from the closest people (significant others), such as family members, friends, and co-workers (Ajzen, 1991).	SN 1. People who are important to me (family, close friends, and so on) think that I should consume the sustainable fashion product SN 2. People who are important to me (family, close friends, etc.) will allow me to consume the sustainable fashion product SN 3. Most people who are important to me (family, close friends, and so on) will consume the sustainable fashion product	Jain et al. (2017)

Variable	Operational Definition	Indicator	Source
Perceived Behavioral Control	Perceived behavioral control is the level of difficulty that a person feels when carrying out certain behaviors based on control over himself (Ajzen, 1991).	PBC 1. If I have the full right to choose, I can confidently consume the sustainable fashion product PBC 2. I believe I have the ability to consume the sustainable fashion product PBC 3. I have the resources, time, and opportunity to consume the sustainable fashion product	Jain et al. (2017)
Purchase Intention	Purchase intention is a person's desire to make a purchase of a product (Jain et al., 2017)	PI 1. I intend to consume the sustainable fashion product PI 2. I have a plan to consume the sustainable fashion product in the future PI 3. I am willing to consume the sustainable fashion product PI 4. I will try to consume the sustainable fashion product in the future	Brandao & Costa (2021)

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Millennial's Decision on the Use of Online Halal Marketplace in Indonesia

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Abstract
This study aims to analyze the Millennials' behavior influence on their decision to use an online halal marketplace in Indonesia, which is mediated by their perception as an intervening variable. A probability sampling technique with convenience sampling was used to calculate 100 from 125 collected primary data sets. The SEM-PLS statistical technique was used to analyze the relationships among variables. The findings showed that only technology adoption, opinions, broader activities, and Millennials' perception influenced their decisions to use the online Halal marketplace, while success & status, personal health, and brand value & reward did not. Millennials' perception is not an intervening variable for all indirect effects. It implies that Millennials consider online Halal marketplace has not been addressed to reserve the Muslim concerns, and their decision to use it did not necessarily derive from religious reasons. Online Halal marketplaces must combine more suitable marketing strategies to increase customer engagement with the Islamic brand by consistently delivering reliable Halal products and services to meet Millennials' needs while penetrating this segment.

Keywords:
marketing; online halal marketplace; consumer decision; consumer perception; millennial behavior

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INTRODUCTION

Indonesia's Islamic economic growth in the third quarter of 2022 grew by 5.5%, higher than the previous year at 1.69%. The two main sectors supporting the growth are the agricultural sector and halal tourism. Bank of Indonesia (BI) is optimistic that in the next year, Islamic economic growth will continue to grow positively, supporting national economic growth and recovery amid the COVID-19 pandemic, driven by halal value chain performance from agriculture, halal food and beverages, Muslim fashion, and halal tourism sectors, with the support of Islamic financing which also continues to increase. Based on the Financial Services Authority (OJK), as of December 2022, the total assets of Indonesia's Islamic finance, excluding Islamic stocks, reached IDR 2,375 trillion (USD 151,03 billion) with a market share of 10.69%, with 5% growth from the previous year. The market share of the Islamic capital market is 18.27%, while the Islamic non-bank financial institution is 4.73%. The Islamic banking market share is also increasing to 7.09%. Indonesia is also home to 31 Fintech companies. Moreover, Alami, a Shariah-compliant of P2P SME lending platform, has participated in multiple equity and debt funding rounds over the year, hoping to become a digital bank (Dinar Standard & Salam Gateway, 2022).

Table 1. Halal Products' Export-Import of Indonesia and OIC Countries

Products	Export to OIC countries (IDR)	Import from OIC countries (IDR)
Halal Food	119 trillion	1,630 trillion
Modest Fashion	6 trillion	268 trillion.
Pharmacy	1,3 trillion	390 trillion
Halal Cosmetics	7 trillion	123 trillion

Source: The State of Global Islamic Economy Indicator (2022)

As a phenomenon gap, Indonesia has the highest Muslim population in the world; however, its Halal food sector is still second after Malaysia; its Modest fashion sector is third after UAE and Turkey; its Halal cosmetics sector is fourth after Singapore, Malaysia, and Turkey; its Islamic finance sector is sixth after Malaysia, Saudi Arabia, Bahrain, Kuwait, and UEA. Overall, Indonesia's Global Islamic Economic Indicator (GIEI) score retains fourth place after Malaysia, Saudi Arabia, and UEA in 2022 (Dinar Standard & Salam Gateway, 2022). The upstream is still low in the halal value chain supply and production. The growth of halal businesses and industry has not been able to support domestic and export needs. Based on the Indonesia Halal Markets Report 2021/2022, as a supplier, Indonesia is still in tenth place, with 3% of halal products exported to OIC countries after China, India, USA, Brazil, Russia, France, Turkey, Germany, and Argentina (DinarStandard, 2021). Moreover, according to the State of Global Islamic Economy Report 2022, there is a data gap between the exports and imports of Indonesia and the OIC countries (see Table 1). In April 2022, the export of Indonesian halal

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food products to OIC countries was only 7.3% compared to the import value from OIC countries to Indonesia. For fashion products, only 2.2%, pharmaceuticals 0.3%, and cosmetics 5.7%.

Since October 2019, the regulation of halal certification in Indonesia has changed from voluntary to mandatory due to the implication of the Halal Product Assurance Law (JPH) No.33/ 2014. The halal product certifications increased from 2020 to 2021. However, in 2022, it decreased for small and medium enterprises (Table 2). Thus, the halal certification process is not fully optimized. Moreover, public literacy is still low. A national survey by the Financial Services Authority (OJK) showed that the Islamic financial literacy index is only 9.14%, while the Islamic financial inclusion index is 12.12%. Another challenge is that the use of technology and digitalization of halal businesses and industry has not been optimum.

Table 2. Halal Certificate Based on Business Scale and Year of Issue

Enterprises	2020	2021	2022
Big	299	2.147	2.578
Medium	400	1.618	575
Small	1.199	2.034	1.122
Micro	3.761	11.720	103.354

Source: Bpjph.halal.go.id (2023)

The government encourages Indonesian consumers to use and take pride in locally-made halal products. To support halal business and industry in Indonesia, Lazada, a leading e-commerce platform in Southeast Asia, launched Lazada Amanah, coinciding with Ramadan 1442 H in April 2022. In Ramadan, people's purchasing power is quite high. Lazada Amanah offers a variety of collections for Muslims' needs, like halal food and beverage, Muslim fashions and accessories, halal cosmetics, health care products, and payment service for donations. Lazada Amanah guarantees that all its products are halal-certified by the Indonesian Ulema Council (MUI). It provides an MUI halal certification checking feature integrated with the MUI website for products on the channel (Winosa, 2021). Lazada Amanah channel joins several other halal marketplaces in Indonesia. Tokopedia launched Tokopedia Salam in November 2019, Indonesia Halal Life Center released Etokohalal in March 2020, Blibli launched Blibli Hasanah in April 2020 (Winosa, 2021), and Shopee launched Shopee Barokah in November 2019 (Mishbakhudin & Aisyah, 2021).

According to Lazada Indonesia's Executive Vice President of Fashion and FMCG Category Director, Jacopo Mor, Lazada Amanah is expected to support the MSME business in Indonesia. During 2020, Lazada recorded a growth exceeding 100 percent in the number of buyers of Muslim products. The growth has continued, given the increase in online shopping due to the COVID-19 pandemic. The owner of the Mybamus brand of clothing sold on the Lazada Amanah recorded a surge in orders of more than 300%

compared to normal trading during the 11.11 season sales festival (Winosa, 2021). However, based on a previous study (Mishbakhudin & Aisyah, 2021), the most frequently searched keyword of "halal marketplace" through Google is Shopee Barokah, followed by Halal Plaza, Halalpedia, Tokopedia Salam, while in the last position is Lazada Amanah. Moreover, based on the map of Indonesian e-commerce in the marketplace category (Ipriceinsights, 2022), although Lazada is still in the top 4 brands visited monthly, after Tokopedia, Shopee, and Bukalapak from 2020 to 2022, it constantly decreased (Aisyah, 2023). Thus, this study will continue to analyze what factors influence consumers, especially Millennials, to choose the online halal marketplace of Lazada Amanah based on their behavior patterns. The findings will highlight recommendations for Lazada Amanah and other online Halal marketplaces to penetrate the Millennial segment.

Based on demographic grouping by Cohort, there were four generations after World War 2: the baby boomers (in that era, baby birth was very high), Generation X, Millennials, and Generation Z (Ali & Purwandi, 2016). According to Alexis Abramson, an expert in generation grouping, the baby boomers were born between 1946 to 1964. Generation X was born between 1965 to 1980, and Generation Z was born from 1997 to 2012. Millennials, or Generation Y, were born between 1981-1996 or around 27 to 42 years old. There are also pre-boomers born before 1945 and post-Gen Z born from 2013 until now. In 2015, Millennials dominated the Indonesian population by 41% of the total population, while 61% were in the productive age (DBS, 2018). Based on the latest data on Indonesia's population by generation in 2020, Millennials are 25.8% of the total population and become lesser than Generation Z (27.94%) but still greater than Generation X (21.88%), the baby boomers (11.56%), pre-boomers (1,87%), and post-Gen Z (10.88%). With this age structure, Indonesia has a relatively young population, which is expected to have a faster rate of development in the next years.

Millennials are chosen in this study because ccurrently, Millennials are at a productive age (27 to 42 years old), which shapes the economy and the world of work for years to come (Sumaedi et al., 2022). Millennials are familiar with technology and connect to the internet 4 to 6 hours a day, like cashless, multitasking, love to travel, have less interest in politics, have fewer goods belonging, and like to share with others. DBS Indonesia's (2018) research on Millennials' impact on industrial development found that 59% of Millennials like 24-hour cashless payments, making them want flexibility. 49.5% are internet users, making them strongly attached to the digital world. 65% of them frequently access social media, making them want ease and speed in various ways. They like sending and receiving money through smartphones, using digital payments and mobile banking, and online shopping, dominating online transaction activities. Thus, their preferences, values, and behavior impact the market and economic conditions (Bire & Nugraha, 2022; Grant et al., 2021).

According to the technology determinism theory by Marshall McLuhan (1962), technology determines a cultural change in human life. Along with technological development today, consumer behavior patterns have changed. Conventional methods are becoming obsolete. There have been transformations toward digitalization in all sectors.

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To be able to survive and compete, marketers must be able to adapt these technologies and utilize them to attract new and retain old customers. To maximize technological advantages, marketers must define the right market segment (Adıgüzel, 2020; El Junusi, 2020; Grewal et al., 2020; Makrides et al., 2020; Nguyen et al., 2007; Rust, 2020; Yusuf, 2009).

The previous study summarized that Millennials, especially the urban middle class, have three unique characteristics. They are creative, confident, and connected. Millennials are creative, rich in ideas and thoughts, and like to think out of the box. They are a highly confident generation and dare to express their opinions without hesitation. Millennials are a connected generation, especially within the communities they follow. They are good at socializing and are active on social media. Millennials are captured as financially secure and active in online transactions, shopping, and transport usage. As a potential market segment, marketers must know Millennials' online behavior and consumption patterns (Ali & Purwandi, 2016, 2017).

Amid the COVID-19 pandemic, customers prefer to use practical and safe online services. Halal products and Islamic services must be able to provide online services that follow customer expectations and perceptions to be competitive in this digitalization era (Riza, 2021). This study will analyze whether the six variables of Millennials' behavior based on a study of Boston Consulting Group (BCG) and the University of Berkeley in 2011, which are technology adoption, opinions, broader activities, success & status, brand value & rewards, and personal health (Fromm et al., 2011, 2015; Fromm & Garton, 2013; Johnson & Ramirez, 2020), directly and indirectly influence their perceptions and decisions to shop at the online Halal marketplace of Lazada Amanah.

Many previous studies found that various external and internal factors, which include consumers' behaviors, influence Millennials' perceptions, intentions and decisions to purchase or use products or services directly and indirectly (Ajzen, 2018; Fishbein & Ajzen, 1975; Huang et al., 2022; Kholid, 2019; Kotler & Keller, 2016; Kumar & Yukita, 2021; Mahyarni, 2013; Pong et al., 2023; Schiffman & Kanuk, 2007; Shah et al., 2016; Sulistyowati et al., 2020; Tan & Leby Lau, 2016; Thusi & Maduku, 2020; Yussaivi et al., 2021; Zainol et al., 2009).

This study will analyze whether Millennials' behavior that consists of six factors (adoption of technology, opinions, broader activities, success & status, brand value & rewards, and personal health) will influence their perceptions and decisions to shop at an online halal marketplace (Lazada Amanah), which is also in line with many other previous studies related technology usages (Ali & Purwandi, 2016, 2017; Ali et al., 2023; Ana & Istudor, 2019; Ashraf et al., 2023; Bargoni et al., 2023; Fromm et al., 2011, 2015; Fromm & Garton, 2013; Goldring & Azab, 2021; Kelm & Ibrahim, 2023; Pate & Adams, 2013; Pop et al., 2022; Savitri et al., 2022; Sulistyowati et al., 2020; Wiridjati & Roesman, 2018).

However, there is a research gap with a previous study by Piarna et al. (2020), which found six factors shaping Millennials' behavior from their habits and social environment

(performance expectancy, effort expectancy, facilitating conditions, hedonic motivation, price value, and perceived risk) do not influence their intention to use online commerce technology. Compared to this study, Millennials' expectancy of the performance of online commerce technology, their expectancy of the efforts associated with online commerce usage, and their condition (knowledge, capabilities, and resources) that facilitate them to use online commerce align with Millennials' adoption of technology. Millennials' hedonic behavior that motivates them to use online commerce aligns with integrating Millennials' broader activities, success & status, and personal health. Millennials' perception of the price value in online commerce and the risk of online commerce usage aligns with brand value & rewards. In comparison, opinion that aligns with social influence in Piarna et al. (2020) influences Millennials' intention to use online commerce.

Although many researchers have conducted studies about Millennials, especially their perceptions, intentions, and decisions, the scientific understanding of Millennials' behavior is still developing. The novelty of this study lies in expanding the analysis of six new variables of Millennial behavior that influence their perceptions and decisions on the use of an online Halal marketplace, placing Millennials' perception as an intervening variable that mediates all indirect effects, and analyzing indicators within the variables which have not been conducted previously. Millennials are captured as a potential market segment as financially secure and active in online shopping and digital transactions. Thus, marketers must analyze their online behavior and consumption patterns.

This study used the eight indicators of Muslim perception of Halal products and Islamic services to measure Millennials' perceptions of online Halal marketplaces. The first two indicators are no harm upon parties and exclude non-halal, adapted from the study of Zainol et al. (2008) and Shah et al. (2016). The other six indicators are no riba, viable alternative, social & welfare, innovative, and service quality, derived from Islamic Banking Bulletin (2013) and Shah et al. (2016). Marketers can predict customers decisions or actual behaviors in the future based on their perception of a certain product or service (Aisyah & Silvia, 2023; Chan et al., 2023; Li et al., 2022; Mishbakhudin & Aisyah, 2021; Rizki et al., 2021; Shaheen, 2016; Suhartanto et al., 2022; Thusi & Maduku, 2020). This study used the five stages of the purchase decision process to measure consumers' decision to shop at Lazada Amanah's online Halal marketplace, which begins with identifying the problem, searching for necessary information, evaluating the available alternatives, deciding the best possible option, and ending with post-purchase evaluation (Cakici & Tekeli, 2022; Gulati, 2022, 2023; Kotler & Keller, 2016; Schiffman & Kanuk, 2007).

Thus, the research objective of this study is to analyze (1) whether the six Millennials' behavior influences their perceptions of the online halal marketplace; (2) whether the six Millennials' behavior influences their decisions to shop at online halal marketplace; (3) whether Millennials' perception as an intervening variable mediate all six indirect effects, and (4) whether the indicators within variables construct the model. The findings will formulate a suitable marketing strategy for online Halal marketplaces to penetrate Millennials.

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METHODS

A probability sampling technique with convenience sampling was used to calculate 100 primary data sets. Convenience sampling was used because the population of online Halal marketplace users was uncertain, and it allowed to freely or coincidentally choose anyone as long as they match the characteristics of the respondent who represents the population as the data source (Ghozali, 2016). This study collected the primary data using questionnaires in Google form as the instrument and delivered it to respondents through the WhatsApp application. To measure respondents' responses, five categories of the Likert scale will determine their approval or disapproval of each variable with a weight of 5 for strongly agree, 4 for agree, 3 for neutral, 2 for disagree, and 1 for strongly disagree (Ghozali, 2016). A probability sampling technique with convenience sampling is used with specific respondents' characteristics, which are Millennials aged 27 to 42 years old, living in Jakarta, Bogor, Depok, Tangerang, and Bekasi (Jabodetabek) region, who had already shopped at Lazada Amanah at least twice a year from 1 January to 31 December 2022 when the social distancing policy of the COVID-19 pandemic was officially ended by the government. From 125 questionnaires distributed, a 100-sample set was analyzed using the Roscoe method, which required 96.04 samples for 95% confidence level.

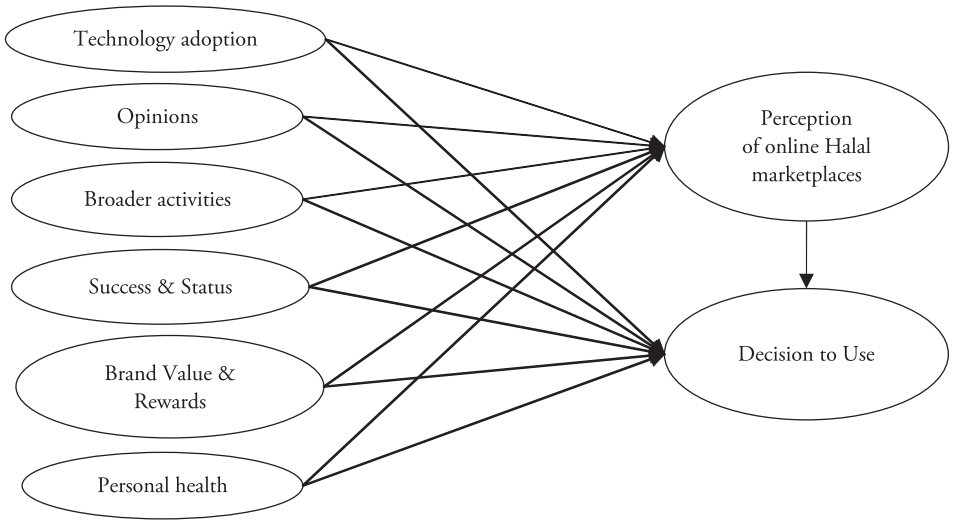
This study will analyze how the six variables of Millennials' behavior influence their perceptions and decisions to shop at the online Halal marketplace of Lazada Amanah based on a study by Boston Consulting Group (BCG) and the University of Berkeley in 2011 (Fromm et al., 2011, 2015; Fromm & Garton, 2013; Johnson & Ramirez, 2020). The six variables of Millennials' behavior are: (1) technology adoption: like to adopt new technology with their devices and use them to access entertainment on the internet, watch less television, consume and contribute more web content, have more friends on social media, value social networking, expect brands to participate in social media, and interact with brands on social networks; (2) opinions: influence by peers, shop collaboratively and differently; (3) broader activities: seek a broader range of activities; (4) success & status: success and status are matter and worth the price; (5) brand value & rewards: loyal to a brand only to seek value and rewards (6) personal health: concern about their health (Fromm et al., 2011, 2015; Fromm & Garton, 2013; Johnson & Ramirez, 2020).

This study uses the eight indicators of Muslim perception of Halal products and Islamic services from Shah et al. (2016), Zainol et al. (2008), and a review of existing literature and reports published by Islamic Banking Bulletin (2013) to measure Millennials' perceptions of online Halal marketplaces. The first two indicators are related to the confirmation of Islamic law, adapted from the study of Zainol et al. (2008) and Shah et al. (2016): (1) no harm is inflicted upon any parties; 2) excluding non-halal or prohibited products in Islam like pork, alcohol, pornography, gambling, weapons, cigarettes, or everything prohibited in Islam. The remaining six indicators are derived from Islamic Banking Bulletin (2013) and Shah et al. (2016), which are related to Shariah compliance within the halal business and industry, namely: 3) guarantee of the absence of *riba* (usury) and other prohibited practices in Islam; 4) as viable alternatives to conventional products and services; 5) have social and welfare values; 6) address to reserve the concern of Muslims; 7) innovative products

and services; and 8) good quality products and services. Consumers' good perceptions of halal products or Islamic services will arouse their intentions and decisions to use them. Knowing consumer perception of certain products and services, marketers can predict their decisions or actual behaviors in the future (Aisyah & Silvia, 2023; Chan et al., 2023; Li et al., 2022; Mishbakhudin & Aisyah, 2021; Rizki et al., 2021; Shaheen, 2016; Suhartanto et al., 2022; Thusi & Maduku, 2020).

Consumers' decision in this study represents their action to purchase or use certain products or services to fulfill their needs and interests from marketers or suppliers in the digital market platforms. A decision comes after a consumer is certain to choose an option out of several options based on available information (Ajzen, 1991, 2018; Fishbein & Ajzen, 1975; Kotler & Keller, 2016; Lai, 2017; Simamora, 2022). This study uses the five stages of the purchase decision process on the using of Lazada Amanah's online Halal marketplace, which begins with identifying the problem, searching for necessary information, evaluating the available alternatives, deciding the best possible option, and ending with post-purchase evaluation (Cakici & Tekeli, 2022; Gulati, 2022, 2023; Kotler & Keller, 2016; Schiffman & Kanuk, 2007). The proposed model is described in Figure 1.

Figure 1. SEM-PLS (Proposed) Model



Based on the proposed model, the hypotheses in this study are: (1) The six Millennials' behavior directly affects their perceptions of the online halal marketplace, (2) The six Millennials' behavior directly affects their decisions to use an online halal marketplace, 3) Millennials' perception as an intervening variable mediates all six indirect effects. The SEM-PLS analysis was used to analyze the hypotheses. It can explain the relationships among variables and constructs to emphasize their values, be able to analyze multiple variables in a complex model with reflective or formative constructs and manage multicollinearity problems. The results will remain robust despite a small sample size, missing data, and un-normal data distribution (Hair et al., 2017, 2018; Hussain et al., 2018; Yamin & Kuniawan, 2011).

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There are outer and inner model evaluations in SEM-PLS analysis. The first step is to evaluate the outer model with Convergent validity tests (require the loading factor, Cronbach alpha, composite reliability greater than 0.7, and AVE greater than 0.5) and Discriminant validity tests (need to compare the cross-loading factors on the construct that must be greater than the other constructs). The next step is to evaluate the inner model by measuring the R-square to measure the goodness of model and Q-square values to indicate whether the exogenous variables are suitable as predictors of the endogenous variable. The Q-square for predictive must be greater than zero. After calculating the R square mean and the commonalities mean, for the goodness of fit model, the GoF required greater than 0.36 (Abdillah & Hartono, 2015; Hair et al., 2017, 2018).

RESULT AND DISCUSSIONS

Table 3 shows that most respondents are female, aged 27 to 35 years, and like to spend time accessing social media for an average of 2 to 5 hours daily, especially Facebook, Instagram and YouTube, where they also mostly saw Lazada Amanah advertising. Most use smartphone applications for online shopping, especially to purchase fashion and accessories. Most use Tokopedia and Shopee. Only 8% choose Lazada as the most used marketplace. Most employees have an average monthly income and expenditure of IDR 2.6 – 5.2 million (middle economic class).

Table 3. Respondent Profile

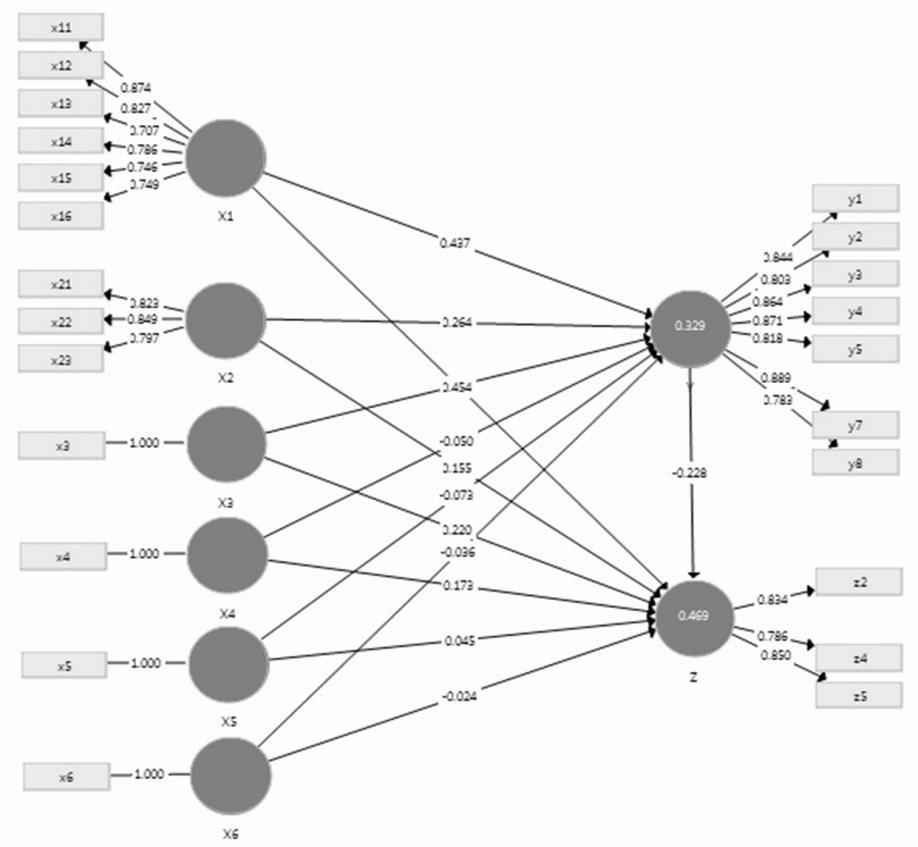
Criteria	Freq.	Criteria	Freq.
1. Gender		2. Age	
Male	11	27 - <35	78
Female	89	35 - 42	22
3. Job		4. Mostly saw Lazada Amanah Ads	
Private employee	29	YouTube	27
Government employee	25	Instagram	38
Entrepreneur	9	Facebook	41
Housewife	18	TikTok	6
Others	19		
5. Income/ month		6. Expenditure/ month	
< IDR 2,6 million	14	< IDR 2,6 million	21
> IDR 2,6 – 5,2 million	49	> IDR 2,6 – 5,2 million	47
> IDR 5,2 – 7,8 million	32	> IDR 5,2 – 7,8 million	29
> IDR 7,8 – 13 million	5	> IDR 7,8 – 13 million	3
7. Most use social media.		8. Social media spending time/ day	
YouTube	21	< 1 hour	0
Instagram	32	1 - <2 hours	31
Facebook	38	2 - 5 hours	59
TikTok	9	>5 hours	10
9. Most use online shopping platforms.		10. Average shopping at Lazada	
Application on smartphone	87	Amanah	0
Website	4	Once a year	92
Social media	9	Twice a year	8
Others	0	3 – 6 times a year	0
		>6 times a year	

Criteria	Freq.
11. Most use marketplace	
Tokopedia	46
Shopee	43
Lazada	8
Others	3
13.Use Lazada Amanah to purchase	
Modest fashion and accessories	58
Halal cosmetics	20
Halal healthcare products	8
Halal food and beverages	11
Islamic donations services	3

Criteria	Freq.
12. Reason use Lazada Amanah	
Religious manner (halal/ no pork/ no riba)	3
Sales & Promotions	85
Lower price (normal season)	5
Good quality products	4
Good quality services	3
14. Religion	
Islam	88
Christian	3
Hindu	2
Budha	2
Konghucu	2
Atheist	1
Others	2

Several tests have to be done to evaluate the measurement model. The first step is to evaluate the outer model with Convergent validity tests (require the loading factor, Cronbach alpha, composite reliability greater than 0.7, and AVE greater than 0.5) and Discriminant validity tests (need to compare the cross-loading factors on the construct that must be greater than the other constructs) (Abdillah & Hartono, 2015; Hair et al., 2017, 2018). Some indicators showed invalid results. Thus, modifications were made to fit the SEM-PLS model by removing the invalid indicators (Figure 2).

Figure 2. Partial Least Square (Modification) Model



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After modification, Figure 2 shows that there are remaining 6 from 8 indicators of X1 (technology adoption), excluding x1.7 (brand participation) and x1.8 (brand interaction). There is also 1 indicator of y6 (preserve the Muslims) excluded from 8 indicators of Y (perception), and 2 indicators of z1 (problem identification) and z3 (alternative evaluation) excluded from 5 indicators of Z (decision).

Table 4 shows that the convergent validity test results are valid for all loading factors, Cronbach's alpha, composite reliability (greater than 0.7), and all AVE (greater than 0.5). For the discriminant validity test, Tables 5 and 6 show valid results. Each construct for the entire cross-loading is greater than the other constructs (Table 5), and the latent variable correlations (Table 6) also show greater values than one another.

Table 4. Convergent Validity

Constructs	Indicators	Loading Factor	Cronbach's alpha	Composite Reliability	AVE
(X1) Technology Adoption	(x1.1) Technology adoption	0.867	0.856	0.893	0.583
	(x1.2) Using devices for entertainment access	0.781			
	(x1.3) Watching less tv	0.705			
	(x1.4) Web contribution & consumption	0.775			
	(x1.5) More online friends	0.715			
	(x1.6) Valuing social network	0.727			
(X2) Opinions	(x2.1) Peers' influence	0.711	0.740	0.853	0.661
	(x2.2) Shop collaboratively	0.880			
	(x2.3) Shop differently	0.839			
(X3) Broader activities		1.000	1.000	1.000	1.000
(X4) Success & status		1.000	1.000	1.000	1.000
(X5) Brand value & rewards		1.000	1.000	1.000	1.000
(X6) Personal health		1.000	1.000	1.000	1.000
Perception of the online halal marketplace (Y)	(y1) No harm upon parties	0.843	0.930	0.943	0.704
	(y2) Exclude non halal	0.805			
	(y3) No riba	0.866			
	(y4) Viable alternative	0.872			
	(y5) Social & welfare	0.810			
	(y7) Innovative	0.892			
	(y8) Service quality	0.779			
Decision to use the online halal marketplace Z)	(z2) Searching for information	0.798	0.765	0.865	0.681
	(z4) Deciding to shop	0.823			
	(z5) Post-purchase evaluation	0.854			

Table 5. Discriminant Validity – Cross Loadings

	Cross Loadings							
	X1	**X2**	**X3**	**X4**	**X5**	**X6**	**Y**	**Z**
X11	0.867	0.738	0.460	0.320	0.366	0.394	0.421	0.700
X12	0.781	0.625	0.489	0.189	0.472	0.379	0.251	0.617
X13	0.705	0.650	0.466	0.237	0.312	0.234	0.438	0.614
X14	0.775	0.610	0.398	0.237	0.266	0.086	0.284	0.559
X15	0.715	0.619	0.299	0.267	0.188	0.200	0.292	0.545
X16	0.727	0.532	1.299	0.267	0.284	0.138	0.313	0.544
X21	0.658	0.711	0.289	0.463	0.225	0.211	0.211	0.610
X22	0.717	0.880	0.370	0.320	0.221	0.343	0.343	0.721
X23	0.652	0.839	0.359	0.398	0.293	0.339	0.339	0.684
X3	0.533	0.420	1.000	0.222	0.219	0.209	0.325	0.483
X4	0.333	0.476	0.222	1.000	0.163	0.297	0.249	0.368
X5	0.416	0.302	0.219	0.163	1.000	0.124	0.199	0.298
X6	0.323	0.346	0.209	0.297	0.124	1.000	0.259	0.271
y1	0.394	0.315	0.191	0.246	0.206	0.223	0.843	0.135
y2	0.438	0.323	0.315	0.185	0.202	0.146	0.805	0.201
y3	0.407	0.372	0.301	0.215	0.192	0.235	0.866	0.212
y4	0.345	0.298	0.282	0.176	0.137	0.277	0.872	0.123
y5	0.256	0.234	0.233	0.189	0.087	0.242	0.810	0.094
y7	0.413	0.364	0.332	0.259	0.123	0.240	0.892	0.211
y8	0.304	0.229	0.228	0.181	0.212	0.169	0.779	0.128
z2	0.631	0.667	0.475	0.312	0.358	0.213	0.170	0.798
z4	0.606	0.671	0.404	0.215	0.109	0.176	0.090	0.823
z5	0.709	0.711	0.320	0.382	0.271	0.280	0.220	0.854

The next step is to evaluate the inner model by measuring the R-square and Q-square values. The R-square value of Perception (Y) is 23%, explained by X1 to X6, while variables outside the model explain another 77%. The R-square value of Decision (Z) is 76%, explained by X1 to X6 and Y, while variables outside the model explain another 24%. The Q-square for predictive relevance is 0.816, which is greater than zero, indicating that the exogenous variables are suitable as predictors of the endogenous variable. After calculating the R square mean (0.4955) and the commonalities mean (0.8286), the Gof (goodness of fit) model is 0.641, which is a big Gof (>0.36).

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Table 6. Discriminant Validity – Latent Variable Correlation

√AVE		Latent Variable Correlation							
		X1	X2	X3	X4	X5	X6	Y	Z
0.764	X1	1.000							
0.813	X2	0.803	1.000						
1.000	X3	0.533	0.420	1.000					
1.000	X4	0.333	0.476	0.222	1.000				
1.000	X5	0.416	0.302	0.219	0.163	1.000			
1.000	X6	0.323	0.346	0.209	0.297	0.124	1.000		
0.839	Y	0.444	0.371	0.325	0.249	0.199	0.259	1.000	
0.825	Z	0.787	0.823	0.483	0.368	0.298	0.271	0.195	1.000

Source: Data processed (2023)

To test the hypotheses, it is significant if the t statistics are greater than the t-value (1.64) with alpha 5%. The direct effect of the path coefficient result (Table 7) shows that only technology adoption (X1) influences Millennials' Perceptions (Y), while Decisions (Z) are only influenced by technology adoption (X1), opinions (X2), broader activities (X3), and perception (Y). Table 8 shows that Millennials' perception is not an intervening variable for all indirect effects.

Table 7. Direct Effect

	Original Sample	Sample Mean	Standard Deviation	T statistics	P value
X1 → Y	0.373	0.390	0.179	2.091*	0.037*
X2 → Y	-0.075	-0.085	0.175	0.429	0.668
X3 → Y	0.110	0.112	0.134	0.823	0.411
X4 → Y	0.101	0.093	0.127	0.801	0.424
X5 → Y	0.012	0.009	0.098	0.123	0.902
X6 → Y	0.110	0.121	0.114	0.964	0.336
X1 → Z	0.338	0.336	0.116	2.927*	0.004*
X2 → Z	0.568	0.569	0.095	5.956*	0.000*
X3 → Z	0.133	0.133	0.065	2.054*	0.040*
X4 → Z	0.011	0.017	0.065	0.178	0.859
X5 → Z	-0.002	-0.002	0.064	0.035	0.972
X6 → Z	-0.011	-0.015	0.063	0.182	0.855
Y → Z	-0.209	-0.205	0.068	3.063*	0.002*

Source: Data processed (2023)
Note: *significant at 5%

Consumers' decisions are influenced, adopted and developed by their perceptions, experiences, preference, culture, lifestyles, habits, environment, personalities and behaviors (Axsen et al., 2013; Chen & Wei, 2022; Decrop, 1999; Jisana, 2014; Khare, 2023; Klein & Sharma, 2022; Li et al., 2023; Pina & Dias, 2021; Prasad & Jha, 2014; Ren et al., 2023; Sharma et al., 2023; Wu & Liu, 2023). The higher their perceptions of a certain product or service, the higher their decision to use it. Knowing consumer perception of certain products and services can predict their decisions or actual behaviors in the future. Consumers' good perceptions of halal products or Islamic services will arouse their intention and decision to use them. It is in line with previous studies by Mishbakhudin & Aisyah (2021) on halal online marketplace usage of Tokopedia Salam, Shah et al. (2016) on Islamic banking perception in Pakistan, Aisyah & Silvia (2023) on Sharia-based e-wallet usage, Thusi & Maduku (2020) on retail mobile banking apps perspective and usage in South African, Suhartanto et al. (2022) on artificial intelligence-enabled mobile banking of Islamic bank loyalty, Rizki et al. (2021) on ride-sourcing perception and usage, Li et al. (2022) on Daigou's online transactions (surrogate shopping) from China, Chan et al. (2023) and Raza et al. (2023) on online food delivery apps usage.

Table 8. Indirect Effects

	Original Sample	Sample Mean	Standard Deviation	T statistics	P value
X1 → Y → Z	-0.078	-0.079	0.044	1.770	0.077
X2 → Y → Z	0.016	0.017	0.037	0.425	0.671
X3 → Y → Z	-0.023	-0.025	0.031	0.742	0.458
X4 → Y → Z	-0.021	-0.020	0.029	0.719	0.473
X5 → Y → Z	-0.003	-0.002	0.021	0.121	0.904
X6 → Y → Z	-0.023	-0.023	0.024	0.958	0.338

Source: Data processed (2023)
Note: *significant at 5%

Along with digitalization, people not only use smartphones to communicate through voice but also through audio-visual. The rapid development of the internet prevents Millennials from being separated from smartphones. They access the internet almost all the time and use it in various activities. The activities include accessing social media, posting photos or videos, and other daily activities such as conducting financial transactions and online shopping. Millennials like to express or upload their daily experiences and activities on social media, complete with reviews often referred to by their fellow Millennials, including before purchasing goods and services. It is easy for consumers to write and talk about a product or brand on various social media. Consumers in the form of bloggers, citizens, vloggers, and others are popping up everywhere. Since they carry their smartphone almost every time, the information circulating on social media is easy for them to access. Social media not only influence Millennials' intention and decision to shop online. It has also prominently influenced their mindsets, values, and behavior

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(Ali & Purwandi, 2016, 2017; Ali et al., 2023; Ana & Istudor, 2019; Ashraf et al., 2023; Bargoni et al., 2023; Goldring & Azab, 2021; Kelm & Ibrahim, 2023; Pate & Adams, 2013; Pop et al., 2022; Savitri et al., 2022; Sulistyowati et al., 2020; Wiridjati & Roesman, 2018).

The findings show that Millennials' perception is only influenced by technology adoption, while other behaviors do not. Technology adoption also influences Millennials' decisions to use Lazada Amanah's online Halal marketplace. There are eight indicators in the technology adoption variable: new technology adoption, entertainment devices, watching less tv, more web contribution and consumption, more online friends, social networking values, expected brand participation and interaction with the brand in social media. *First*, Millennials are more likely to adopt new technology with their devices. A phone is no longer just a phone. If it connects to the internet, it becomes an entertainment device. The functionality of any given device overlaps with other devices. Millennials do not tie to their life stages by being early technology adopters. They do not worry about what features will be available in the next six months because another powerful device will be available next year if they can afford to buy or upgrade it. *Second*, Millennials are likelier to use their devices to access online entertainment. When it comes to using the web, Millennials are always on. They access multiple web-enabled devices whenever they go, making them powerful internet users. They go online for many things. They like being updated about news, navigation directions, or weather conditions. Millennials stand out when producing and uploading online content, like photos, videos, product or service reviews, wiki entries, blog posts, and microblog posts. They spend about 11 to 12 hours per week online, not including email handling. From the number of entertainment-based devices they own, Millennials spend much of their time seeking entertainment online by playing games, watching streaming videos, listening to music, reading web magazines, or accessing social media. They tend to subscribe to the web, news feeds, and social media like Facebook, Instagram, Youtube, Twitter, and LinkedIn (Ali & Purwandi, 2016, 2017; Ali et al., 2023; Ana & Istudor, 2019; Ashraf et al., 2023; Bargoni et al., 2023; Fromm et al., 2011, 2015; Fromm & Garton, 2013; Goldring & Azab, 2021; Kelm & Ibrahim, 2023; Pate & Adams, 2013; Pop et al., 2022; Savitri et al., 2022; Sulistyowati et al., 2020; Wiridjati & Roesman, 2018).

Third, Millennials watch less television. They still watch it but much less often than other generations before them. They consider watching only their favorite programs. If they miss the show, they will watch it online, streaming to their smartphone. *Fourth,* Millennials contribute and consume more web content. They often rate products and services online, upload new content, and subscribe to web data or news feeds. They also have social media accounts, websites, web pages, and blogs. *Fifth,* Millennials have more friends on social media, significantly larger than generations before. *Sixth,* Millennials value social networking. Social media connection enriches their lives daily. They even feel missing something if they are not on the social network. They monitor news feeds and notifications all day long. If offline for a while, they usually scroll down until they get caught up. Social media is not something they do now and then. It is an integral

part of their lives and how to communicate with friends. They feel like missing out on something if they are offline for too long. *Seventh,* Millennials expect brands to participate in social media. They seek out and value brands' presence and expect brands to participate in social media. If the brand does a poor job communicating with them, they will unlike it as quickly as they liked it. *Eight,* Millennials frequently interact with brands on social networks. When they have a real-world interaction with a brand, they will go to their social media account to like its content and talk about it, regardless of whether the experience was positive or negative (Ali & Purwandi, 2016, 2017; Ali et al., 2023; Ana & Istudor, 2019; Ashraf et al., 2023; Bargoni et al., 2023; Fromm et al., 2011, 2015; Fromm & Garton, 2013; Goldring & Azab, 2021; Kelm & Ibrahim, 2023; Pate & Adams, 2013; Pop et al., 2022; Savitri et al., 2022; Sulistyowati et al., 2020; Wiridjati & Roesman, 2018).

Thus, the higher the technology adoption, the higher the perception and decision to use Lazada Amanah's online Halal marketplace. However, the model excluded 2 indicators of brand participation (x1.7) and brand interaction (x1.8) in social media as the constructs of technology adoption variable, implying Millennials did not have any expectation for Lazada Amanah brand to participate in their social media and did not have any active interaction with Lazada Amanah brand before in their social media. It is in line with the findings in Table 3, which show that most Millennials prefer to use Tokopedia (46%) and Shopee (43%) as the most used marketplace brand for online shopping, only 8% chose Lazada (conventional) and other marketplaces (3%). It implicates that its marketing strategies, especially its brand promotional program, such as social media advertising, have a low impact on Millennials' activities on social media. Advertising endorsers' exposure rate can change consumer preferences and attitudes to promote purchase intention and decisions (Anand et al., 1988; Laroche et al., 1996; Pandjaitan, 2018). Thus, Lazada Amanah needs to increase its promotional mix strategies, especially to increase its brand trust and loyalty on social media, accessed by Millennials very often for 2 to 5 hours daily.

The finding shows that opinion influences Millennials' decisions to use Lazada Amanah's online Halal marketplaces. There are three indicators in the opinions variable: heavily influenced by peers, shop collaboratively and differently. Millennials seek peers' input and affirmation before purchasing, including consulting in person, through phone, texting or social media. Once they have done their research, they will have confidence in purchasing. Millennials like to shop collaboratively by relying more on social media input before deciding. Their tendency to gather information is not limited to asking people they know for advice. They also seek advice or reviews from public figures, professionals or companies to help them make decisions. Millennials have come of age in crowdsourcing, where large groups are entrusted to provide solutions more effectively than others, so it feels natural to gather as much information as possible before making a decision. On the flip side, they tend to feel overwhelmed by too much information, so they must strive to strike a balance. Thus, they will decide after someone else shows their opinions (Chi et al., 2021; Fromm et al., 2011, 2015; Fromm & Garton, 2013;

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Johnson & Ramirez, 2020; Kim et al., 2019; Müller et al., 2023; Nguyen et al., 2022; O'Connor, 2016; Smith, 2011).

Millennials shop differently from older generations. It is not whether they conduct research or what resources they utilize. It is how they conduct the research. It is not necessarily done while sitting at a desk. They use their smartphones to help them make final decisions while standing inside a store comparing prices or determining the origin of a particular product from social media or other online resources. Millennials' attitudes, channel preferences, and shopping behaviors differ from those of older generations. Most agree that having a smartphone on the go is convenient. They use it to research products or services while shopping (Chi et al., 2021; Fromm et al., 2011, 2015; Fromm & Garton, 2013; Johnson & Ramirez, 2020; Kim et al., 2019; Müller et al., 2023; Nguyen et al., 2022; O'Connor, 2016; Smith, 2011). The higher the peers' influence, social media reviews, and activities to research Lazada Amanah from their smartphones, the higher Millennials' decisions to shop at its online Halal marketplace.

The finding shows that Millennials' broader activities influence their decisions (Z) to use Lazada Amanah's online Halal marketplaces. Millennials seek a broader range of activities. Due to their life stage, they desire to have many experiences and travel as much as possible within or outside their country. They have a global view of travel and enjoy everything from eating various ethnic cuisines watching films, and rock climbing. Millennials' broader activities are not limited to their actual experiences but can also derive from other people's memorable experiences. Common trends shape Millennials' perceptions of a new product or service, which can be based on their interpretation of other people's experiences in their circles or social networks. As a result, the expectations and experiences of other people also shape how Millennials like to experience the same thing and how much they engage during those activities. Thus, contributing to their ability to retrieve benefits from other people's experiences will give rise to Millenials' broader activities to their future interests and decision to do the same. As experience-driven consumers, Millennials are motivated to engage and co-create their own experiences with broader activities based on other people's experiences (Bunmajarinon & Kaewnuch, 2022; Fromm et al., 2011, 2015; Fromm & Garton, 2013; Johnson & Ramirez, 2020; Kim et al., 2019). The higher the broader activities with Lazada Amanah based on Millennials' and other people's experiences, the higher their decisions to shop at its online Halal marketplace.

The finding shows that Millennials' perspective on their achievement of success & status recognition does not influence their perception and decisions to use Lazada Amanah's online Halal marketplaces. Success is a matter of hard work for Millennials, while status is worth the price. They are driven to work hard to be successful in their careers. It is the most important thing in their lives. Millennials place success and status higher than older generations, who feel their success achievement and status recognition are in their own hands. As they age, people redefine their personal success and status expectations. Millennials tend to consume luxury products to showcase their success and higher social status, which helps them feel that they have achieved their goals in life.

Millennials' perception of the value of a successful life and high social status influence their perception, intention, or decision to purchase particular products to enhance their social status (Fromm et al., 2011, 2015; Fromm & Garton, 2013; Hatane et al., 2020; Jansom & Pongsakornrungsilp, 2021; Johnson & Ramirez, 2020; Kang et al., 2022; Kim et al., 2020; Moreno et al., 2017). This study reveals that Millennials do not consider using Lazada Amanah's online Halal marketplace to represent their success or higher status recognition in their community.

The finding shows that Millennials' concerns about their personal health do not influence their perception and decisions to use Lazada Amanah's online Halal marketplaces. Millennials are strongly concerned about their personal health. Although their intentions are strong, they do not always follow through. Most Millennials intend to work out regularly, but only a few consider themselves health fanatics. Due to vanity and their desire to impress others, most of their exercises are to enhance their physical appearance. Millennials also enjoy relaxation and rejuvenation. Some of them regularly treat themselves to spa services. Despite their commitment to staying healthy, Millennials tend to stray from their exercises and diets on weekends. There is a noticeable difference between Millennials' intention to work out regularly and the number of actual exercises they truly accomplished (Fromm et al., 2011, 2015; Fromm & Garton, 2013; Johnson & Ramirez, 2020). This study also reveals that Millennials do not consider using Lazada Amanah's online Halal marketplace to benefit their concerns about personal health.

All generations are highly influenced by price, quality, and product reviews when making purchase decisions. Consumers' perceptions, intentions or purchase decisions on a certain product or service are also influenced by brand image (Ali et al., 2022; Enjelina, 2022; Helmi et al., 2022; Hendrawan & Agustini, 2021; Shin & Choi, 2021). However, different from older generations, most Millennials are only loyal to specific brands to seek value and rewards in return. Only half of Millennials intend to continue purchasing the brands they grew up with, and most are willing to switch brands in exchange for a discount. They are even willing to purchase a non-favorite brand to take advantage of a sale or promotion (Fromm et al., 2011, 2015; Fromm & Garton, 2013; Johnson & Ramirez, 2020; Logsdon, 2016; Modreanu & Andrisan, 2022).

Millennials are prone to price sensitivity as utilitarian consumers. However, they like to spend on high-tech products and other hedonistic consumption. They also like environmentally and socially responsible products. Previous studies show that they are less sensitive to the price of products with ethical attributes and prefer over-price consumption when the product engages in corporate social responsibility (López-Fernández, 2020). They are willing to purchase an over-price product or service to support a cause they believe in, even if it means paying more. Thus, Millennials will switch brands to save money but are willing to pay extra for charity support (Fromm et al., 2011, 2015; Fromm & Garton, 2013; Johnson & Ramirez, 2020).

The finding shows that Millennials' brand value and rewards-seeking do not influence their perceptions and decisions to use Lazada Amanah's online Halal marketplaces. Moreover, Millennials' perception does not mediate or is not an intervening variable for all indirect

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effects. Overall, they have a good perception of Lazada Amanah as an online halal marketplace that provides no inflicted harm upon any parties, all products and services are halal, no riba or other un-permissible matter according to the Islam law provides innovative and good quality products and services. However, the model excluded 1 indicator of y6 (address to reserve the concern of Muslims) from the Perception variable construct, implicating that Millennials did not consider Lazada Amanah as an online Halal marketplace that addresses reservations for Muslims' concerns. Thus, Lazada Amanah must increase its corporate social responsibility programs with more promotional programs like sponsorship events for Muslims and the entire community, especially for the needy.

At the same time, success & status, brand value & rewards, and personal health concerns do not influence Millennials' decisions to shop at Lazada Amanah. It is only influenced by technology adoption, opinions, broader activities, and Millennials' perception of a Halal marketplace. The model excluded 2 indicators of z1 (problem identification) and z3 (alternative evaluation) from the Decision variable construct, implying Millennials did not enter the problem identification process (z1). They only shopped at Lazada Amanah because impulse buying derived from sales and promotional offers. Most use Lazada Amanah to buy modest fashion and accessories (58%), 20% halal cosmetics, 11% halal food and beverages, 8% halal health care, and 3% to pay Islamic donations. Most did not enter the alternative evaluation process (z3) when buying such products because they had already decided which products they wanted to buy after searching for the only necessary information. It is in line with the findings in Table 3, which show that although all Millennials already shopped at Lazada Amanah twice and more last year, most (85%) chose it only to get sales or promotions, and surprisingly, 12% of them were non-muslims. Only 5% chose Lazada Amanah because of its lower prices than other marketplaces, 4% because of its good product quality, and 3% because of its good service quality.

Lazada Amanah's goals are to support halal business and industry in Indonesia, as well as to support the Muslim community, the highest population in Indonesia (87.7%), to practice their religious teaching by offering a variety of products and services for Muslims' needs, guarantees its halalness by having the halal certification of Indonesian Ulema Council (MUI). It also provides an MUI halal certification checking feature integrated with the MUI website for products on the channel and joins several other halal marketplace channels in Indonesia (Winosa, 2021). However, when respondents (88% are Muslim Millennials) bought fashion and accessories (58%), cosmetics (20%), food and beverages (11%), and healthcare products (8%) at Lazada Amanah, they rated Lazada Amanah as no different from other online marketplaces. In reality, only 3% chose it because of religious concerns to ensure that the products and services are halal or permissible according to Islamic law, implicating Millennials' decision to use it did not necessarily derive from religious reasons.

Indonesia has the largest Muslim population in the world. As many as 87.7% or more than 207 million people are Muslims. The pattern of Muslims in Indonesia is also very diverse in terms of religious school of thought, rituals, the spread of Islamic mass organizations, and the relationship between religions and the state (Ali et al.,

2015). As part of Millennials, until 2030, are expected to make up 70 % of the total productive age population, Muslim Millennials are the most potential segment for online Halal marketplaces to penetrate. They need to create interesting social media posts that are not only about their products or services but also about Millennials' experiences, creative reviews, and testimonies, which will increase their positive interactive information. An advertising endorser's popularity, expertise, and attractiveness can quickly appeal to consumers' eyesight and increase better perception and purchase decisions (Chi et al., 2009; Pandjaitan, 2018). They must choose the right endorsers for Millennials because they have distinctive characteristics. They can collaborate with religious youtubers like Ria Ricis and Atta Halilintar, who already have 15.6 million and 9.3 million followers, especially for younger Millennials, or Dedy Corbuzier, an artist who converted to Islam, which also has 5.3 million followers, especially for older Millennials.

There are also hijrah artists like Arie Untung, Teuku Wisnu, etcetera. Who has millions of followers. They have successfully created a hijrah community. An event that is booming among Muslim Millennials in Indonesia is the Hijrah Fest. Hijrah Fest has become a surge of enthusiasm for Millennials enjoying the path of hijrah. From it first held in 2018 until now, each event successfully filled with thousands of visitors, most Millennials. It is proof that Indonesian Millennials are currently very concerned with Islam. The Hijrah Fest was held periodically in the month of Ramadhan. While fasting, participants were treated with religious activities such as studies, entertainment, and tenants' bazaars (Kumparan.com, 2019). Such events are the right place to get involved and work with ustadz (i.e., ustadz Abdul Somad and Adi Hidayat, who also have millions of followers) and hijrah artists' community to promote and advance the online Halal marketplace in Indonesia, especially among Millennials.

Most hijrah artists are also entrepreneurs. Due to the increasing religious implementations amid the COVID-19 pandemic, most hijrah artists resigned or were limiting their acting jobs in television series, movies, or cinemas. Online Halal marketplaces are the best platforms for them to sell their products. Due to symbiosis mutualisms, the hijrah artist can benefit from the online marketplace as endorsers or brand ambassadors. Millennials are hungry for information. The online halal marketplace provider must be proactive and aggressive, voicing their views and ideas to get a true picture of marketplaces that are Shariah compliance but profitable for all users.

CONCLUSION

This study concluded that only technology adoption influences Millenilas' good perception of online halal marketplaces. Only technology adoption, opinions, broader activities, and Millennials' perception influenced their decisions to use an online Halal marketplace, while success & status, brand value & reward, and personal health concerns did not. Millennials' perceptions did not mediate or act as an intervening variable for all indirect effects. It implies that the higher their adoption while using Lazada Amanah apps, the more peer-influenced, collaborative shopping and information-seeking from

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smartphones while shopping, and with broader activities and higher perception of the good of Halal marketplaces, the higher the Millennials' decision to shop at Lazada Amanah.

Millennials will be part of the Indonesian demographic bonus in 2030. With their creativity, confidence, connectivity, and increasing numbers of productive age populations, Millennials will be a potential market segment for business. Thus, the chance for online halal marketplaces to penetrate this segment is still high. However, it needs a special strategy to win them. Muslim Millennials in Indonesia still prefer conventional online marketplaces due to their more prominent advantages than online halal platforms. In reality, they use it only to get promotional offers.

The online Halal marketplace is still in its early phase. Nonetheless, its potential disruptions to the conventional online marketplace should not be underestimated. The National Committee for Islamic Economy and Finance (KNEKS) focuses on developing the halal ecosystem. As the policy implication, KNEKS and the government must provide relevant regulations and infrastructure related to national development policy and strategic programs to support the development of MSMEs (micro, small, and medium enterprises) in Indonesia's Sharia Economy and Finance Ecosystem. It includes the online Halal marketplaces as one of the vehicles that need to be in place to synergize with various initiatives and coordinate with various efforts to digitally empower MSMEs in Indonesia. Digital technology utilization in online marketplace services challenges how e-commerce adapts to innovation. It is no exception for the online halal marketplace. Targeting Millennials who spend most of their time online must be innovative.

Millennials will abandon companies with products and services absent from digital innovation. They are captured as financially secure and active in online transactions and shopping. Marketers must know their online behavior and consumption patterns as a potential market segment. The finding implicates that Millennials consider online Halal marketplace has not been addressed to reserve the Muslim concerns, and their decision to use it did not necessarily derive from religious reasons. Thus, online Halal marketplaces must combine more suitable marketing strategies. With more advanced technology, higher algorithm engagement on social media, more digital advertising and social campaigns, and many other digital communication strategies that suit Millennials' activities, online Halal marketplace like Lazada Amanah could encourage Millennials to use it more often, increasing customer engagement with the Islamic brand by consistently delivering reliable Halal products and sharia-based services to meet Millennials' needs while penetrating this segment.

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Gender Inequality and Foreign Direct Investment: Empirical Evidence from Asian Countries

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Abstract

In Asian countries, the relationship between gender inequality and foreign direct investment (FDI) is a sensitive topic. Due to labor market limits and the advantageous effect of women's empowerment, gender inequality is thought to have a detrimental impact on economic development and FDI. This study aims to look into the influence of gender disparity on FDI inflows to Asian countries. Our data includes 43 Asian nations and spans the years 1990 to 2018. We discover that reduced tertiary-level education and health gaps play a decisive role in FDI inflow into Asian countries using the Generalized Method of Moments (GMM). The findings are crucial to devising policies to minimize the gap in gender equality and promote FDI.

Keywords:

gender inequality; foreign direct investment; education gap; health gap; generalized method of moment

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INTRODUCTION

Trade liberalization policies were expected to lessen the pay gap in developing countries while negatively affecting the wage structure in wealthier nations (Aguayo-Tellez, 2012). However, after three decades of empirical data, a sizable body of work on the impact of trade liberalization policies (TLP) and foreign direct investment (FDI) on wage disparity and employment has found something different. The wage gap has grown in developed and developing economies due to TLP and FDI.

Bui et al. (2018) also explore the link between gender inequality and FDI in developing economies. Due to labor market constraints and the beneficial outcome of women's empowerment, gender inequality damages economic progress. The relationship between women's rights and a nation's ability to compete in the global economy offers an intriguing conundrum. Women's education is associated with higher economic development and progress within a nation (Klasen, 2002; Berik et al., 2009; Klasen & Lamanna, 2009; Berik, 2011; Farooq et al., 2019). Respect for women's rights implies a more skilled workforce and a secure business environment, which may appeal to foreign investors more (Coleman, 2010; Busse & Nunnenkamp, 2009).

However, preserving economic disparities between the sexes, primarily through pay inequality, may help nations compete more successfully in the global economy (Seguino, 2000, 2010; Busse & Spielmann, 2006; Bezuidenhout et al., 2019). In semi-industrialized nations and export-competitive sectors, the benefits of this "low road to growth" are obvious (Seguino et al., 2009). These disparate results point to a nuanced and complicated relationship between women's rights and a state's economic objectives, as women's empowerment may have different impacts on a nation's capacity to grow and fight on the global stage.

Chaudhuri & Mukhopadhyay (2014) stated that in most countries, particularly developing ones, gender inequalities in labor markets indicate a compensation gap between men and women. Jamielaa (2018) show that gender wage gap is narrower in low quantile wage distributions than in high quantile distributions. Few studies have examined FDI's influence on gender-based wage discrepancies, with mixed findings. FDI may have two adverse effects on gender pay differentials: on the one hand, the difference may widen due to women's weaker negotiating leverage in MNCs, and on the other hand, MNCs may reward the higher education levels of female workers, narrowing the gender wage gap. Foreign capital may drive economic progress, but an equal, welfare-maximizing state is only achieved if gender wage discrepancy reduces with economic growth and well-being. FDI in countries with female-intensive export sectors may enhance gender pay disparity but not economic welfare. These findings show a trade-off between wage inequality and economic health (Chen et al., 2013).

Stolzenburg et al. (2021) studied globalization, notably FDI and gender disparity, using matched employer-employee data from South Africa. They analyze whether foreign-owned companies have a different gender pay gap (GWG) than domestic firms. Foreign-owned companies had a lower unconditional GWG than native ones. The

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proportion of women in international companies is lower than in domestic firms, which contradicts comparative studies and may reflect unfair opportunities for women in a developing country. Girmay (2018) claimed that foreign direct investment (FDI) inflows might raise gender gaps in gender-unequal developing nations and that transnational companies (TNCs) must augment their routine FDI operations with different policies and investments to guarantee that women are not rendered worse off.

This study builds a philosophical foundation in global gender justice and then explores empirical data showing ethically problematic regions of FDI and gender equality. It then discusses why gender vulnerability to FDI must be addressed based on the global gender justice philosophy. The study utilizes cosmopolitan business ethics to establish TNCs as accountable for ensuring FDI inflows do not harm women, and it suggests policies and actions enforce this obligation. McLaren & Yoo (2017) state that measuring the effect of FDI on household welfare is more difficult rather than measuring the effect of trade policy.

Blanton & Blanton (2015) said there is disagreement about how women's rights affect a country's competitiveness in the global economy. Many good things happen when women have access to education and political power, but the effects of economic rights are complicated. Most research on what causes FDI does not look at gender. Moreover, some papers that look into this FDI Gender parity nexus do not consider a broad measure of the latter. Therefore, to fill this gap, we look at the role of women's rights in attracting FDI to help us understand these issues better. Foreign capital is a crucial part of many countries' plans for growth and development, and many of the growth areas for FDI depend heavily on women's work. The novelty of this research is that it analyses an empirical model of FDI determinants that considers a variety of variables for gender inequality and focuses on many areas of gender inequality, including disparities in education (primary, secondary, and tertiary education) and health.

We analyze panel data of 43 Asian nations from 1990 to 2018 using a two-step System Generalized Method of Moments to estimate our model because of its dynamic nature and to address the endogeneity concern. Our data support the theory that gender parity promotes FDI inflows. The empirical model and estimation methods are discussed in the next section. Section 3 explains our empirical findings. Finally, we provide some closing observations in the last part.

METHODS

In this analysis, we use Cheng and Kwan's (2000) technique, which accounts for agglomeration's economic impacts. Technology spillovers, industry-specific localization, and economic geography are three elements that are considered crucial in the spatial clustering of investment capital in agglomeration economies. To capture the influence of these three elements, Kinoshita & Campos (2003) employ the 1-year lagged value of FDI. Furthermore, using lagged FDI mitigates the effects of the missing variable (Brzozowski, 2013).

$$FDI_{it}=\beta_1 FDI_{it-1}+\beta_2 Gender\ gap_{it-1}+\sum_{j=1}^{k}\gamma_j X_{it-1,j}+\upsilon_i+\nu_t+e_{it} \quad (1)$$

On the right-hand side of the equation, we adopt the form of a dynamic panel data process with a lagged dependent variable. We employ a system generalized method of moments (GMM) estimate approach introduced by Blundell & Bond (1998) to account for the correlation between the lagged dependent variable and the country time-invariant e_{it}, as well as the problem of the endogenous explanatory variable. The error term in the GMM approach is first order auto-correlated by design. There should be no second-order auto-correlation, though. As a result, we use the Arellano-Bond test to evaluate the fundamental hypothesis of no second order autocorrelation. The fact that this null hypothesis was rejected implies that GMM estimations are inconclusive. The quantity of instruments is another issue with the GMM approach. The number of instruments must not exceed the number of countries, according to the rule of thumb.

Several ideas have been proposed to explain the factors that influence FDI. On the other hand, empirical evidence reveals that distinct theoretical models do not replace one another. As a result, Faeth (2009) suggested that some theories, including agglomeration economics, market size, production cost, country risks, policies, and institutional quality, should be used to investigate the determinants of FDI. The factors of market size and trade openness are found to have excellent explanatory power when it comes to FDI determinants (Busse & Nunnenkamp, 2009; Chakrabarti, 2001). According to the market size theory, market-seeking FDI is attracted to nations with high market demand and rapid growth rates. We utilize the logarithm of GDP as a proxy for market size, as in earlier research (Brzozowski, 2013; Resmini & Casi, 2010). Given the large amount of FDI flowing into tradable industries, the greater the degree of openness a country has, the more appealing it is to foreign investors (Demirhan & Masca, 2008).

We include the inflation rate in the empirical model to account for macroeconomic policy and stability. Given the importance of macroeconomic and political risks in shaping investment decisions, a background of stable pricing levels demonstrates the government's commitment to promoting a favorable investment climate. According to Kinoshita & Campos (2003), many developing and transitional countries have developed stabilization measures to reduce inflation. As a result, low inflation indicates a solid program that aids in achieving higher short-term growth. As a result, keeping prices low and consistent is an excellent approach to attracting additional FDI.

Labor costs are the most contentious aspect of FDI because their impact varies depending on the type of FDI. However, to account for efficiency-seeking FDI, this variable must be controlled in the model. Because pay data is scarce, we utilize the unemployment rate as a proxy for labor costs, as suggested by Blanton & Blanton (2015). Furthermore, transportation and communication costs should be mentioned as a reliable predictor of FDI. Poor infrastructure investment is frequently cited as a barrier to attracting FDI, particularly when foreign investors can help create infrastructure for the host country (Demirhan & Masca, 2008). As suggested by

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the literature, we use the number of mobile phones per 100 people as a proxy for infrastructural development.

We examine four dimensions of gender inequality in our study's primary explanatory variables, which are markers of gender disparity: inequality in education, inequality in health, and inequality in wealth. We use two indices to measure the extent of educational disparity, or the education gap, as Brzozowski (2013) suggested. We would like to know whether Asian countries' FDI inflows are more brawny or brainier. The ratio of female to male enrollment rates in primary schools is the first indication. For secondary schooling, the second indicator is constructed in the same way. For tertiary education, the third indicator is constructed in the same way. The tertiary education gap favors high-skilled labor because university education is coupled with some vocational training in some nations. As mentioned previously, we also test for the inequality in the health hypothesis. The ratio of female to male life expectancy at birth is used to calculate the health gap indicator (Brzozowski, 2013). All variables were taken from the World Bank's World Development Indicators database. Our research spans the years 1991 to 2018. There are 43 Asian nations for which we have data. Appendices 1 show the descriptive statistics for each variable.

RESULTS AND DISCUSSION

The impact of gender disparity characteristics in the education and health sectors on attracting FDI in Asian nations, as well as the significance of other control variables, is investigated. We used the GMM approach to estimate our empirical model since a lagged dependent variable on the right side of the equation causes OLS estimators to be inconclusive. We estimate a baseline model with only the control variables in column (1) of Table 1. We introduce our four proxies of gender inequality discussed in the preceding section, namely the primary education gap, secondary education gap, tertiary education gap, and gender health gap, in order from columns (2) to (5). The control variables have the predicted indications in general, but only a few are significant. As expected, the lagged value of FDI is a good predictor of present FDI. Furthermore, the coefficient's value is positive and smaller than 1, ensuring the stability of our models. The GDP coefficients are positive and highly significant in all models. This finding shows that foreign investors in these nations seek a vast, rapidly increasing market, verifying the market-seeking or horizontal FDI hypothesis.

This result is supported by Demirhan & Masca (2008), Busse & Nunnenkamp (2009), and Brzozowski (2009). The proxy of GCF is another control variable with consistent importance across models. FDI is influenced by capital formation in a positive and significant way. Foreign investors want to invest in countries with a robust capital market, as Jordaan (2004) highlighted because a strong capital market means better production potential across models. FDI is influenced by capital formation in a positive and significant way. Foreign investors want to invest in countries with a robust capital market because a strong capital market means better production potential (Jordaan, 2004). A healthy capital market could show the government's commitment to creating a favorable

investment climate. Moreover, a strong capital market can help firms reduce production costs, such as transportation and communication costs (Akalpler & Adil, 2017).

In Table 1, columns (2), (3), and (4), we present three proxies for measuring gender inequality in education: the female to male enrolment rate in primary, secondary, and postsecondary education. In terms of the findings, both the primary and secondary educational gap variables have a negative sign, which is consistent with Blanton & Blanton (2015), but with lesser explanatory power than Busse & Nunnenkamp (2009). A negative indication suggests that foreign investors are less inclined to invest in countries where male and female education levels are significantly different. Xu et al. (2021) conclude that there is a negative relationship between FDI and income inequality.

Table 1. GMM Estimation Results

	(1)	(2)	(3)	(4)	(5)
L.FDI	.348***	0.343***	0.336***	0.337***	0.344***
	(8.39)	(8.29)	(8.03)	(8.12)	(8.35)
GDP	.61***	0.605***	0.621***	0.657***	0.573***
	(7.52)	(7.42)	(7.66)	(7.75)	(6.9)
GCF	.036***	0.037***	0.037***	0.036***	0.037***
	(4.53)	(4.55)	(4.57)	(4.56)	(4.61)
EXPORT	.023***	0.024***	0.023***	0.023***	0.023***
	(4.25)	(4.28)	(4.2)	(4.13)	(4.21)
IMPORT	-.005	-0.005	-0.005	-0.004	-0.006
	(-0.98)	(-0.96)	(-0.9)	(-0.72)	(-1.17)
INFLATION	0*	0*	0*	-0.001**	-0.001**
	(-1.93)	(-1.9)	(-1.94)	(-2.03)	(-2.08)
Unemployment	.61	0.004	0.004	0.004	-0.004
	(0.16)	(0.18)	(0.17)	(0.17)	(-0.2)
Primary Gap		-0.008			
		(-0.73)			
Secondary gap			-0.015		
			(-1.43)		
Tertiary gap				0.011*	
				(1.65)	
Health gap					-0.266**
					(-2.25)
Observations	776	776	776	776	776
Mean dependent var	20.933	20.933	20.933	20.933	20.933
SD dependent var	2.271	2.271	2.271	2.271	2.271
Chi-square	627.948	627.643	632.211	633.511	633.692

t-statistics in parentheses ***,**and* denote significance at 1, 5 and 10% respectively

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Table 2 Panel 2SLS (IV) Estimation Results

	(1)	(2)	(3)	(4)	(5)
GDP	0.958***	0.954***	0.971***	0.992***	0.917***
	(35.58)	(35.62)	(36.11)	(35.49)	(34.97)
GCF	0.021***	0.016***	0.018***	0.019***	0.023***
	(3.64)	(2.83)	(3.23)	(3.36)	(4.25)
Export	0.014***	0.012***	0.012***	0.011***	0.018***
	(4.52)	(3.72)	(3.61)	(3.28)	(5.97)
Import	0.008**	0.01***	0.011***	0.012***	0.002
	(2.23)	(2.72)	(2.85)	(3.12)	(0.62)
Inflation	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(-2.91)	(-3.09)	(-2.9)	(-2.76)	(-3.77)
Unemployment	0.099***	0.095***	0.101***	0.099***	0.08***
	(7.85)	(7.55)	(8.06)	(7.93)	(6.55)
Primary gap		-0.024***			
		(-3.54)			
Secondarygap			-0.03***		
			(-3.99)		
Tertiarygap				-0.019***	
				(-4.06)	
Healthgap					-0.18***
					(-8.87)
Observations	874	874	874	874	874
Mean dependent var	20.824	20.824	20.824	20.824	20.824
SD dependent var	2.390	2.390	2.390	2.390	2.390
R-squared	0.656	0.661	0.662	0.662	0.684
F-test	275.212	240.831	242.219	242.449	268.259
Prob> F	0.000	0.000	0.000	0.000	0.000

T statistics in parentheses***,**and*denote significance at 1,5and 10% respectively

The coefficients for the primary and secondary educational gaps, on the other hand, are insignificant, while the coefficient for the tertiary educational gap has a positive sign. Ben Saâd & Assoumou-Ella (2019) state that public spending on education will reduce gender inequalities at all levels of education. The composition of FDI inflows is to blame for the poor explanatory power. Both vertical and horizontal inflows characterize FDI inflows in the Asian area. Foreign investors also invest in a number of industries, ranging from low-skilled manufacturing to high-skilled factoring, as well as extractive and service industries. There are industries that desire brawny labor, while others prefer brainy labor. Vahter & Masso (2019) highlights that foreign owned firms substantially larger gender wage gap than domestic owned firms.

Blanton & Blanton (2015) show that the educational gap is minor in the extractive and highly skilled manufacturing sectors but large in the services sector.

Choi & Greaney (2022) find that MNEs bring their home countries' gender norms in employment with them. Anyanwu (2016) state that FDI inflows positively associated with gender equality in youth employment. Pantelopoulos (2022) conclude that female participation in the workforce will attract FDI. On contrary, Baliamoune-Lutz (2007) conclude that globalization and growth does not have an impact on gender equality in non-SSA developing countries. Besides that, Bogliaccini & Egan (2017) state that FDI in services is more likely to be associated with inequality than FDI in other sectors.

We look into the impact of health disparities on FDI inflows and publish our findings in Column 5. Large health disparities between men and women make the host country less appealing to foreign investors, resulting in lower FDI inflows. There could be a number of reasons for this: Efficiency-seeking foreign investors would be unable to benefit from a sick labor force. Previous research has demonstrated that greater disparities in health and a wider health gradient can reduce aggregate labor output (Grimm, 2011). The result of Grimm (2011) is unaffected by the direct effect of unequal mortality on labor force composition. With this research, it is clear that foreign investors would benefit from a healthy labor force in terms of productivity. Employee health would improve, reducing absenteeism and thereby increasing productivity. Another reason why foreign corporations may ask their staff to perform brawn-intensive work. Taken as a whole, it can be argued that foreign investors favor a labor force with an equal quality of health between male and female employees.

CONCLUSION

FDI plays such a vital role in fostering economic activity, most governments place a high priority on obtaining it. We used a traditional approach to develop an empirical model and use ratio of female to male enrolment rates in primary, secondary, and tertiary education, as well as the ratio of female to male life expectancy at birth, as proxies of gender inequality. We find that educational and health difference has explanatory power in attracting FDI. Foreign investors are attracted to host nations that have narrowed the gender health gap. FDI takes advantage of parities in economic and political rights between men and women and uses them as a weapon to boost their productivity.

These findings have significant important for policy formulation. A higher level of education will affect the economy of a country. The authorities in Asian region should focus on formulating policies to reduce the education and health gap to attract more foreign investment and thereby foster economic development. The government needs to build education and health facilities in all regions, including rural areas

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Appendix 1. Summarized statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Year	1247	2004	8.37	1990	2018
LnFDI	1126	20.305	2.69	2.303	26.396
LnGDP	1169	24.423	2.105	19.187	30.242
GCF	1076	26.883	9.257	-.693	69.527
EXP	1120	44.006	32.951	.005	228.994
IMP	1120	45.88	29.028	.016	208.333
INF	1039	14.809	124.318	-18.109	3373.759
UNEM	1198	6.002	4.343	.11	30.229
PRIGAP	1247	2.768	8.626	-17.137	82.021
SECGAP	1247	.728	6.883	-19.496	39.893
TERGAP	1247	-1.827	9.665	-47.854	40.208
HEALTHGAP	1247	-4.711	2.521	-12.779	.568

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Fiscal Transfer Policies and Road Infrastructure Reduce Income Inequality in Rural-Urban Areas

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Abstract
Fiscal transfer policies and road infrastructure are essential in reducing inequality in Indonesia. However, previous research examining the effect of fiscal transfer policies and road infrastructure still came up with inconclusive findings, thus making it necessary to conduct further research on rural, urban, and sub-national areas in Indonesia. This study examines the impact of fiscal transfer policies and road infrastructure on reducing income inequality in rural, urban, and sub-national areas. The authors utilized time-series data from 2012 to 2021 and 34 provinces. The fixed effect GLS model showed that Kuznets' hypothesis existed at rural, urban, and sub-national levels. The results also showed that the special allocations fund significantly reduced income inequality in rural, urban, and sub-national areas. However, road infrastructure was significant only in urban areas. The findings suggest that the special allocation fund policy can be expanded in scope and increased in number to accelerate the reduction in income inequality.

Keywords:
inequality; road infrastructure; rural; special allocation funds; urban

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INTRODUCTION

The extensive economic inequality, to some extent, is hard to avoid and always becomes an issue and a topic of debate among researchers and policymakers. The government must impose community regulations to minimize income inequality (Chancel et al., 2022). Considering the critical issue of the impact of income inequality on individuals, politics, social, and the economy (McGregor et al., 2019), it is deemed critical that policymakers take preventive measures to avoid a far more severe impact (Shukla & Mishra, 2019). Notably, there has been a huge income inequality gap between urban and rural areas. As stated by Imai & Malaeb (2018), income inequality occurs between urban and rural areas and in several ASEAN countries such as Thailand and Vietnam.

In Indonesia, the UNDP report predicts that the population in the top 10% of income oscillates around 40-50%. Income inequality has increased slightly since 1980, but in the late 1990s and early 2000s, there had been short-run fluctuations (Chancel et al., 2022). Urban inequality in Indonesia contributes significantly to national income inequality. In March 2020, the level of income inequality, as measured by the Gini Ratio, was 0.393, and in rural areas, it was 0.317 (Badan Pusat Statistik, 2021). This condition illustrates that inequality in urban areas is higher than in rural areas. Compared to the previous period, income inequality in urban areas in September 2019 was 0.391 or 0.001 points lower than in urban areas in March 2019, 0.092. Meanwhile, in rural areas in March 2019, it was 0.317 and decreased by 0.002 points compared to September 2019, i.e., 0.315 (Badan Pusat Statistik, 2020).

Many previous studies using the Gini Coefficient or Theil Index have measured inequality, particularly by analyzing income and consumption expenditure metrics using single-dimensional indices (Lazaridis, 2000; Lin, 2007). A pioneer in the study of inequality, Sen (1997) stated that there is nothing mathematically wrong with measuring inequality coming from income. Thus far, the evidence gathered shows that wealth inequality has increased in many countries over the last few decades, albeit at different speeds, highlighting the crucial roles of domestic institutions. These findings have been a concern among academicians, policymakers, and the public and have contributed to renewing the interest in wealth distribution theory (Benhabib & Bisin, 2018).

There are many factors determining the acceleration or deceleration of income inequality from a variety of previous studies, including fiscal decentralization (Chen et al., 2020; Deyin et al., 2017; Goerl & Seiferling, 2014; Makreshanska-Mladenovska & Petrevski, 2019; Sepulveda & Martinez-Vazquez, 2011; Stossberg & Blöchliger, 2017), social and physical infrastructure in the form of roads, and the economic infrastructure such as education, healthcare, communication technology, energy, sanitation, and water (Irianti & Prasetyoputra, 2021; Kocsis & Xiong, 2022; Makmuri, 2017; Zhang & Zhang, 2021; Zolfaghari et al., 2020), equal distribution of education (Bloome et al., 2018; Naveed et al., 2018; Organization of Economic Co-operation and Development, 2015; Shukla & Mishra, 2020), financial cash transfers (Enami et al., 2019; Yusuf, 2018), and poverty (Bourguignon, 2004; Kalwij & Verschoor, 2007; Ogbeide & Agu, 2015; Stevans & Sessions, 2005). Some of these researchers have examined the determinants

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of inequality at the country, inter-countries, and regional levels. Meanwhile, this study examines the determinants of income inequality in urban and rural areas and income inequality in general as conducted by (Imai & Malaeb, 2018; Lu et al., 2022), but retesting for the cases in Indonesia still needs to be done. In the same vein, Zhang & Zhang (2021) also have not included the fiscal transfers and research at the rural and urban levels concerning income inequality.

The roles of government in reducing inequality through fiscal decentralization policy are deemed critical. The essence of the policy is to divert the development budget from the central to the regional government. Fiscal policy directly affects inequality through tax progressivity, well-organized transfer, and the quality of public spending, indirectly affecting other factors determining income and wealth inequality (Odusola, 2019). The same result clearly showed that fiscal decentralization has significantly reduced income inequality (Feld et al., 2021; Goerl & Seiferling, 2014; Makreshanska-Mladenovska & Petrevski, 2019; Su et al., 2019), including rural and urban inequality (Chen et al., 2020; Deyin et al., 2017)

On the other hand, some studies did not support the findings of previous studies, which have found that decentralization increased inequality (Clifton et al., 2017; Saputra, 2012; Sepulveda & Martinez-Vazquez, 2011; Siddique et al., 2008). Liu et al. (2017) also found that fiscal decentralization tends to increase inequality due to variability in levels of economic development, equal regional distributive policies, natural resources, and infrastructure imbalances. The same result revealed by Fan et al. (2020) highlighted that high central-to-regional transfers have not been able to reduce inter-regional inequality in per capita GDP and per capita income; in fact, the equalization effect was only found in urban income. Recent studies have also found that fiscal decentralization or policy increased income inequality (Cevik & Correa-Caro, 2020; Kyriacou et al., 2017; Liu & Long, 2021; Ong et al., 2023) and even tend to be weak (Canare et al., 2020).

Meanwhile, the provision of public capital, such as infrastructure, is deemed critical for the activities of households and companies (Zolfaghari et al., 2020) as well as production and consumption (Zou et al., 2008). Public capital becomes an engine of growth and a determinant of the distribution of wealth, income, and welfare (Chatterjee & Turnovsky, 2012). Infrastructure is a type of capital goods, institutions, and services that serve the activities of many industries in the market (Jain, 2012). It can be divided into two - economic and social infrastructure. The economic infrastructure refers to public utilities such as electricity, telecommunications, water supply, sanitation, and drainage; public engineering constructions such as dams and irrigation systems; and transportation facilities such as railways, ports, and airports.

In contrast, social infrastructure refers to education, health care, and health services (Zou et al., 2008). In addition, infrastructure can support economic growth by increasing labor and capital productivity, thereby reducing production costs and increasing profitability, production, income, and employment (Nallathiga, 2015). This study focuses on road infrastructure as the primary variable, while water supply, sanitation, and drainage become the control variables.

Road infrastructure has been proven to be capable of reducing income inequality. A recent study by Lu et al. (2022) found that road infrastructure is more important for rural residents to increase their income. Even a study has found that public investment in road construction has prompted economic growth and reduced poverty (Churchill et al., 2021; Zou et al., 2008). Other studies have confirmed previous findings that government spending for public capital can increase wealth inequality over time (Chatterjee & Turnovsky, 2012; Zolfaghari et al., 2020). Similarly, previous studies found that road transportation infrastructure can reduce income inequality (Huang et al., 2020; Mishra & Agarwal, 2019; Nugraha et al., 2020; Zhang & Zhang, 2021). On the other hand, some researchers have found less impact of infrastructure development on reducing income inequality (Fullerton Jr. et al., 2014). Other researchers have also shown that transportation infrastructure does not reduce income inequality (Fageda & Olivieri, 2019; Makmuri, 2017).

The differences in the research findings might be related to the differences in the research sites, variable measurement, and the level of economic development as another determining factor (Rodríguez-Pose & Tselios, 2010; Tselios, 2014), government size (Goerl & Seiferling, 2014; Sepulveda & Martinez-Vazquez, 2011), educational expansion (Shukla & Mishra, 2020; Tselios, 2014), poverty (Afandi et al., 2017) and other economic sectors (Zolfaghari et al., 2020). Even though this is not the first study to investigate the impacts of fiscal transfers and road infrastructure on income inequality, it is deemed crucial given the domestic perspective of Indonesia's context, which certainly requires another examination. Evaluating the consistency of the Kuznets curve with rural, urban, and rural-urban analysis units in Indonesia has been carried out previously with individual data (Tadjoeddin, 2013), international (Aktas & Iyidogan, 2022; Sidek, 2021), national (Yusuf et al., 2014), and sectorial district (Yusuf et al., 2021).

Several previous studies that have tested the relationship between fiscal transfers to regions and road infrastructure with income inequality still came up with inconsistent findings. In general, the interrelationships of these variables are analyzed separately, and few combine them in one analysis. In addition, in one study, a few previous researchers have yet to test the determinants of income inequality in rural, urban, and rural-urban areas. Thus, this study aims to examine the effect of fiscal transfer policies, road infrastructure, and control variables on rural, urban, and rural-urban income inequality to complement the existing literature on this issue, especially in the Indonesian context. The researchers used the Generalized Least Square (GLS) panel data regression model to find reliable evidence. This study adds to previous works, especially on the aspect of fiscal transfers in the form of general allocation funds and expansion of the use of special allocation funds (physical and non-physical) by the provincial government and road infrastructure in reducing various aspects of income inequality by taking into account rural-urban income inequality. Our empirical results corroborate that fiscal transfers and road infrastructure reduce income inequality. Therefore, this study provides results that policymakers can use to formulate policies that focus on strengthening fiscal transfers and building road infrastructure and how plans and interventions can be used as effective instruments to achieve income distribution in urban, rural, and national areas.

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METHODS

This study used a quantitative method with a correlational design to examine the effects of fiscal transfer policy, road infrastructure, and control variables on income inequality using static and dynamic panel data regression. The secondary data refers to data obtained from the processing of a second party or data obtained from BPS (Central Bureau of Statistics) publications, academic literature, or journals, and those relevant to this research. The research used secondary data from a time series between 2012 and 2021 and cross-sectional data for 34 provinces (individuals) in Indonesia.

This research used the Gini Inequality Index (GI) dependent variable to measure income inequality. The data were used to estimate the Gini coefficient of household income inequality at the provincial level. The Gini coefficient is a commonly used measure of inequality (Allison, 1978; Badan Pusat Statistik, 2021). Gini inequality index variables consist of the rural (GIR), urban (GIU), and rural-urban (GI) inequality index as the dependent variable. The Gini coefficient value is 0 – 1 (perfect equality to perfect inequality). Since this research had to use household income data, the Gini coefficient captured the distribution of household income in all household populations rather than the distribution of personal income among individuals. This research also used the inequality approach to income between rural-urban areas over time (Fuguitt et al., 1988; Imai & Malaeb, 2018; Jamal, 2019; Johnson & Lichter, 2020).

This study utilized the general allocation fund, special allocation funds (Mardiasmo, 2006), road infrastructure (Chatterjee & Turnovsky, 2012; Lu et al., 2022; Makmuri, 2017), and GDRP per capita (Chan et al., 2014; Khan & Padda, 2021; Muinelo-Gallo & Roca-Sagalés, 2013; Naguib, 2017) as the leading independent variables. Meanwhile, the control variables in this study included the mean years of schooling (Badan Pusat Statistik, 2022), poverty (Afandi et al., 2017; Khusaini et al., 2020), health infrastructure (Zolfaghari et al., 2020), and economic openness (Agusalim & Pohan, 2018; K. Huang et al., 2022; Khan & Padda, 2021; Sukoco et al., 2020). In addition, the authors also utilized the control variables, namely water supply and sanitation (Irianti & Prasetyoputra, 2021), unemployment (Badan Pusat Statistik, 2022; Taresh et al., 2021) and gender empowerment index (Badan Pusat Statistik, 2022).

This study used the panel data regression model to predict the effects of fiscal transfer policy and road infrastructure on income inequality in rural, urban, and rural-urban areas. This model comprises ordinary least squares (OLS), fixed, and random effects models. This study used the Hausman Test to choose between the fixed and random effects models (Baltagi, 2005), which maintains that the fixed effects model remains applicable. Before applying the fixed effect panel regression method, this study tested the classical assumptions as an OLS linear regression to choose the right method to use in the data. In general, the panel data model can be written as follows:

$$y_{it} = \alpha_{it} + \beta' X_{it} + e_{it} \quad (1)$$

Based on equation (1), the specifications of the general econometric model of this study are:

$$g_{it} = \gamma_{it} + \gamma_1 \ln (gdrpcap)_{it} + \gamma_2 lngaf_{it} + \gamma_3 lnsaf_{it} + \gamma_4 lnroad_{it} + \beta_i Z_{it} + e_{it}$$

where g = Gini inequality index (rural, urban, and rural-urban), *ln(gdrpcap)* = log natural of per capita income, *lngaf* = log natural of general allocation funds, *lnsaf* = log natural of special allocation funds, *lnroad* = log natural of road length province with an asphalt surface, i = provinces 1, 2, …, 34 and t = 2012 to 2021, Z = control variable consisting of mean years of schooling/*mys*, poverty/*pov*, unemployment/*unemp*, economic openness/*openness*, health infrastructure/*inhealth*, proper sanitation/*sanit*, clean water sources/*water*, and index gender empowerment/*gei*. γ = estimated parameter and e = error term.

Therefore, the use of random effects and generalized leans square (*GLS*) models is able to cope with the heteroscedasticity dan autocorrelation problem (Greene, 2003) because the *OLS* assumption is not fulfilled. The use of *OLS* may result in parameter estimation that is no longer efficient. The use of the *REM* equation model in a simple form can be written as follows:

$$y = \beta X + \varepsilon + \omega \quad (2)$$

Then equation (2) can be written as an error ($\mathcal{E}$) equation:

$$\varepsilon = y - X\beta - \omega \quad (3)$$

To obtain an estimate of β with Generalized Least Squares is to minimize the squared error function ($\mathcal{E}$).

$$\sum_{i=1}^{n} \varepsilon_i^2 = \varepsilon'\varepsilon = (y - X\beta - \omega)'(y - X\beta - \omega) \quad (4)$$

In order for the value of $\mathcal{E}'\mathcal{E}$ to be a minimum, a first-degree derivation of β is needed and equated to zero, as follows:

$$\frac{\partial(\varepsilon'\varepsilon)}{\partial\beta} = 0$$

$$-2X'y + 2X'X\hat{\beta} + 2X'X\omega = 0$$

$$X'X\hat{\beta} = X'y - X'\omega$$

so,

$$\hat{\beta} = (X'X)^{-1}(X'y - X'\omega) \quad (5)$$

since β is equal with β_{GLS}, then

$$\hat{\beta}_{GLS} = (X'\varphi X)^{-1}(X'\varphi y - X'\omega)$$

where ϕ is the weight

RESULT AND DISCUSSION

A descriptive analysis of the condition and development of income inequality at the regional, provincial, and national levels is presented before elaborating on the fiscal transfer policies and infrastructure's effects on income inequality. In 2013 and 2015,

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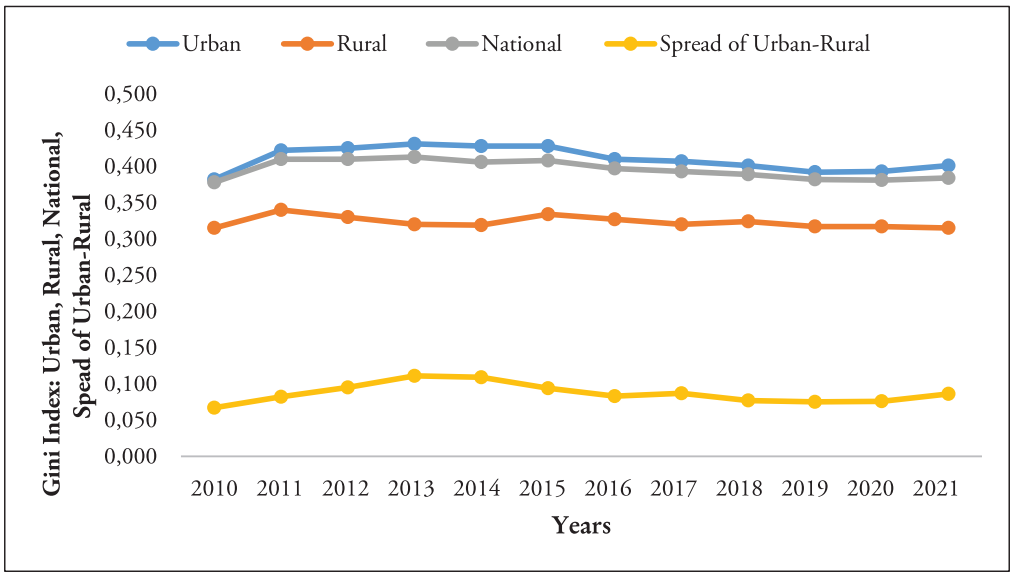
the Gini inequality index increased, indicating that the distribution of the population's expenditure in that period was getting worse. Meanwhile, since 2016, the expenditure disparity has continued to decline, showing the improvement in the distribution of population expenditure, as shown in Figure 1.

Figure 1. The Development of Indonesia Gini Index, Urban, Rural and the Difference of Urban and Rural, 2010 – 2021



Source: Badan Pusat Statistik (2021, 2022)

Figure 1 above also explains that the income or expenditure inequality measured by the Gini index between urban and rural areas had the same trend during 2010-2021. Still by region, in 2011-2013, the Gini Ratio in urban areas increased and started to decline from 2014 to 2020 (Badan Pusat Statistik, 2021, 2022), but it increased in 2021. On the other hand, a different pattern occurred in rural areas. In 2011-2013, the rural Gini Ratio declined but increased in 2015 and 2018 before the expenditure inequality decreased in 2019-2021. The development pattern of income inequality among residents of urban areas follows the pattern of national development.

The development of the Gini index between 2012 and 2021 is presented to identify the decline rate in expenditure inequality with the Gini index during the research period. The calculation results showed that the highest decline in expenditure inequality was found in Papua, with 11.18%, followed by Kalimantan, with 10.88%. However, in 2012 and 2021, the expenditure disparity in the Nusa Tenggara region experienced the opposite condition compared to other regions, which increased by 5.34%. The changes in expenditure inequality among urban, rural, and urban-rural by region are presented in Table 1.

Table 1. The Development of Index in Accordance to Urban-Rural Area, 2012 and 2021

Area	Year	Urban	Δ Urban	Rural	Δ Rural	Urban- Rural	Δ Urban- Rural
Sumatera	2012	0.379		0.311		0.359	
	2021	0.342	-9.64%	0.268	-13.98%	0.314	-12.47%
Java and Bali	2012	0.406		0.321		0.398	
	2021	0.396	-2.46%	0.312	-2.80%	0.385	-3.10%
Kalimantan	2012	0.374		0.301		0.357	
	2021	0.333	-11.00%	0.271	-10.03%	0.315	-11.61%
Sulawesi	2012	0.412		0.359		0.398	
	2021	0.393	-4.57%	0.338	-5.72%	0.371	-7.53%
Nusa Tenggara	2012	0.387		0.299		0.358	
	2021	0.371	-4.01%	0.319	6.70%	0.362	-6.62%
Maluku	2012	0.335		0.290		0.344	
	2021	0.299	-10.76%	0.253	-12.61%	0.297	-13.66%
Papua	2012	0.367		0.365		0.427	
	2021	0.310	-15.42%	0.409	12.21%	0.378	-11.49%

Table 1 shows that the changes in urban expenditure inequality in 2012 and 2021 occurred in all regions. In urban areas, the fastest rate of decline was found in Papua, with 15.42%, while the slowest was found in Java and Bali, with only 2.46%. However, two regions in rural areas experienced a rise: Nusa Tenggara and Papua. Conversely, other regions experienced a decrease in income inequality. This condition indicated that the income inequality in rural areas during this period was worse than in urban areas.

Furthermore, by comparing the average acceleration of decrease or increase in the disparity in expenditure/income among residents at the provincial level, such as in Eastern Indonesia and Western Indonesia, this study revealed that the decline in the average expenditure inequality in Eastern Indonesia was lower than that of Western Indonesia so that by the end of 2021 the Gini index level in Eastern Indonesia had been higher, with an average of 0.358 (see Table 2).

Table 2. The development of the Gini Index based upon the West-East Indonesia area, in 2012 and 2021

Area	Year	Urban	Δ Urban	Rural	Δ Rural	Urban-Rural	Δ Urban-Rural
West Indonesia	2012	0.386		0.311		0.371	
	2021	0.357	-7.57%	0.284	-8.86%	0.338	-8.85%
East Indonesia	2012	0.375		0.328		0.381	
	2021	0.343	-8.46%	0.330	0.57%	0.352	-7.76%
Average		0.358	-8.01%	0.314	-4.14%	0.357	-8.30%

Table 2 shows that the decline rate in expenditure inequality in urban areas from 2012 to 2021 in Eastern Indonesia was more rapid than in Western Indonesia's urban

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areas, with an average decline of 8.01%. In contrast, income inequality was getting worse in rural areas in Eastern Indonesia (up 0.57%), and the overall Gini index in rural areas decreased by 4.14%. The provincial development target, as recorded in the National Medium-Term Development Plan (Indonesian, RPJMN) 2020-2024, states that "inequality between provinces was reduced by encouraging the transformation and accelerating development in the Eastern Region of Indonesia, including Kalimantan, Nusa Tenggara, Sulawesi, Maluku, and Papua and by maintaining the momentum of growth in Java, Bali and Sumatera Regions" (Appendix I of the Presidential Regulation, 2020). However, this effort would be hard to realize because differences in resources and characteristics in each region are the primary factors of the increasing expenditure and development inequality (Heinrich Mora et al., 2021; Kamaruddin & Alam, 2019), especially in rural areas. Therefore, policymakers at the provincial level should pay more concern to the economic sectors that absorb more labor to make a real contribution to increase economic growth and empower people with lower incomes (Raharti et al., 2021).

A summary of the research data statistics should also be presented to control the research data before testing the relationship between variables. Statistical summary includes the average values, maximum values, and minimum values. The average Gini index value during the study period (2012-2021) in urban areas was higher than in the sub-national and rural areas. Table 3 presents the aforementioned statistical summary.

Table 3. Statistical Summary

Variables, n = 340	Mean	Std. Dev
giu	0.372	0.043
gir	0.312	0.042
gr	0.360	0.039
lngdrpcap	10.402	0.560
lngaf	7.124	0.787
lnsaf	5.842	1.768
lnroad	6.998	0.573
pov	11.205	5.912
mys	8.222	0.996
unemp	5.325	1.955
openness	5.722	7.614
lnhealth	2.444	0.317
sanit	68.296	15.851
water	76.372	13.976
gei	67.706	6.660

Table 3 shows that the average provincial per capita income in 2010 showed constant values at the national level, with IDR 39,712,220 per population per year. The average value of general allocation funds (Indonesian, DAU) and special allocations (Indonesian, DAK) was IDR 1,241.41 billion and IDR 695.22 billion, respectively. The average value

of the length of paved roads under the province's authority was 995.41 kilometers. The average poverty score for the province was 11.16%, and the mean years of schooling was 8.22 years. The average unemployment rate per province per year was 5.29%.

Meanwhile, the average ratio of imports to exports was 5.72% per year, and health facilities in hospitals, health centers, and auxiliary health centers were 277.97 units. The average percentage of the population accessing proper sanitation and clean water was 28.96% and 36.37%, respectively. The average women's empowerment index was 76.71%.

Table 4. The Results of the Regression of Fixed Fffect of GLS Rural and Urban

Variables	Rural[a]			Urban		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 2
lngdrpcap	0.760*** (0.222)	-0.077*** (0.016)	0.912*** (0.311)	0.206 (0.237)	-0.064** (0.024)	0.635** (0.265)
lngdrpcap^2	-0.039*** (0.011)	-	-0.047*** (0.015)	-0.015 (0.012)	-	-0.031** (0.013)
lngaf	-	0.001 (0.002)	0.002 (0.002)	-	0.004 (0.003)	0.002 (0.002)
lnsaf	-	-0.003*** (0.001)	-0.003*** (0.0001)	-	-0.003** (0.001)	-0.004** (0.001)
lnroad	-	0.027*** (0.006)	0.031*** (0.007)	-	-0.021** (0.009)	0.0003 (0.008)
pov	-	-0.0002 (0.001)	0.0002 (0.001)	-	0.002 (0.002)	0.001 (0.001)
mys	-	-0.001 (0.008)	-0.002 (0.007)	-	-0.142 (0.009)	-0.010 (0.009)
unemp	-	-0.002 (0.001)	-0.002 (0.001)	-	-0.002* (0.001)	-0.001 (0.001)
opennes	-	0.0001 (0.0001)	0.0001 (0.0001)	-	0.0001 (0.0003)	-0.0001 (0.0002)
lnhealth	-	0.0002 (0.056)	0.034 (0.055)	-	-0.112 (0.071)	-0.165*** (0.056)
sanit	-	-0.0002 (0.0002)	-0.0001 (0.0002)	-	0.0002 (0.0002)	-0.0001 (0.0002)
water	-	0.0006*** (0.0001)	0.0004** (0.0002)	-	0.0003 (0.0003)	0.0002 (0.0003)
gei	-	0.0007** (0.0003)	0.0005* (0.0003)	-	-0.011*** (0.003)	-0.001** (0.0003)
Constant	-3.278***	0.872***	-4.358***	-0.150	2.524***	-2.381*
R^2	0.8442	0.8623	0.8640	0.8238	0.8588	0.8407
Adjusted R^2	0.8263	0.8411	0.8425	0.8036	0.8307	0.8157
F-stat	47.022	40.573	40.096	40.623	30.556	33.625
Prob.(*F*-statistic)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Obs.	330	330	330	340	340	340

Note: *sig. = 10%, **sig. = 5%, ***sig. = 1%; a = not including DKI Jakarta Province

First, the researchers conducted the Chow test to select the Common Effect (CE) or Fixed Effect (FE) model. The test results showed that all cross-section Chi-square

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values were 336.324 - 582.525, and the probability value was 0.000 < 0.005; thus, the FE model was selected. Furthermore, the researchers chose between the Fixed Effect and the Random Effect (RE) models utilized with the Hausman test (Hausman, 1978). Both models were potentially valid in estimating the panel model with the unobserved provincial heterogeneity. Hence, the FE or RE model could be a valid model based on the results of the Hausman specification test. A formal test of the Hausman specification was estimated to generate the right decision between the two models: FE and model and RE model. The test results for all models showed that the Chi-square statistic of the cross-sectional random was 12.249 – 66.054 while the Probability value was 0.000 – 0.002 < 0.05. Thus, the effects model remained consistently applicable for the analysis.

The results of the residual normality of all analytical models with Jarque-Berra resulted in a Probability value of 0.3507 - 0.9368 > 0.05, indicating the normal distribution of the data. The correlation value between independent variables could be used for multicollinearity. The correlation calculation result showed that r = -0.3151 – 0.6059 < 0.80, indicating that the model is free from multicollinearity. Also, since the panel data have cross-sectional and time series dimensions, data analysis commonly faces heteroscedasticity and serial correlation (Beck, 2001; Hsiao, 2007). Some of the causes of this problem have been extensively discussed by Beck (2001), who revealed the following results. First, provincial governments can have their variants of error related to their unique regional characteristics; second, there might be a spillover of the errors (surprise) in one provincial government to other regions within the same region. This condition may lead to serial autocorrelation if a shock from one provincial government is correlated to the shocks from other provincial governments in the same year; third, within the same provincial government, shocks or errors in the current years might be correlated with errors in the previous period or periods.

Based upon the problems related to the nature of the data in the panel model, the researchers tested the results of the autocorrelation test using the Durbin-Watson (DW) value criterion, i.e., the DW value between 1 and 3 (Field, 2009). Thus, conservatively, there would be no autocorrelation problem (though the value around two also becomes a concern). In this model, the value of DW was 1.517 – 1.885; hence, the model is free from the autocorrelation problem. Finally, the heteroscedasticity test was carried out using the White-Heteroscedasticity test, namely the Obs*R-squared of 9.675 – 161.493 and the probability value for all models of 0.000 – 0.022 < 0.05. On this basis, it was found that there was a heteroscedasticity problem in the regression model.

Further, the relationship between fiscal transfer policy road infrastructure and income inequality was examined. Here, several income inequality models used a panel estimation analysis of Generalized Least Squares (GLS). This estimator produced not optimally biased results for considering heteroscedasticity and serial correlation in panel data (Hansen, 2007; Musau et al., 2015). Table 4 below presents the results of the GLS panel containing coefficients, standard error, probability values, R2, and F-stat.

Table 5. The results of the Regression of Fixed Effect of *GLS* all (Rural-Urban)

Variables	Rural-Urban		
	Model 1	**Model 2**	**Model 3**
lngdrpcap	0.3337** (0.155)	-0.036*** (0.016)	0.526*** (0.182)
lngdrpcap^2	-0.021*** (0.007)	-	-0.026*** (0.008)
lngaf	-	0.0005 (0.001)	0.001 (0.001)
lnsaf	-	-0.003*** (0.001)	-0.003*** (0.0008)
lnroad	-	0.006 (0.005)	0.008 (0.005)
pov	-	0.002** (0.0009)	0.002** (0.0009)
mys	-	-0.019*** (0.005)	-0.017*** (0.006)
unemp	-	-0.001 (0.001)	-0.001 (0.0008)
opennes	-	0.0001 (0.0001)	0.00003 (0.00009)
lnhealth	-	-0.036 (0.039)	-0.072** (0.039)
sanit	-	0.00003 (0.0001)	0.0001 (0.0001)
water	-	0.0004** (0.0002)	0.0002 (0.0002)
gei	-	0.00001 (0.0002)	-0.00004 (0.0002)
constant	-0.867	0.950***	-1.961**
R^2	0.8883	0.9128	0.9229
Adjusted R^2	0.8754	0.8895	0.9108
F-stat	69.060	68.441	76.218
Prob.(*F*-statistic)	0.0000	0.0000	0.0000
Obs.	340	340	340

Note: *sig.=10%, **sig.=5%, ***sig.=1%

Tables 4 and 5 show that Kuznets' hypothesis showing the relationship between per capita income and income inequality has existed in rural, urban, and rural-urban areas for all provinces in Indonesia (with control and uncontrol variables), except in urban areas (Urban Model 1) that was without control variables. Hence, it is clear that the increase in people's income at the beginning was proven to increase income inequality significantly, but when reaching the threshold of certain income per capita, increasing income per capita was able to reduce income inequality in rural, urban, and rural-urban areas (with control variables). On the other hand, the coefficient value of fiscal transfer

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as measured by the general allocation fund was 0.001 – 0.004, which was statistically insignificant in the rural, urban, and rural-urban models (see Tables 4 and 5). This result means that the general allocation fund increased the average income inequality in rural, urban, and rural-urban, although it was insignificant.

The coefficient value of the special allocation fund was -0.003 to -0.004 (rural, urban, and all models 2 and 3). This result indicates that special allocation funds could reduce the average income inequality in Indonesia's rural, urban, and rural-urban areas. The road infrastructure coefficient value was -0.021 – 0.031. It was statistically significant by 1% and 5% in the rural and urban models, but insignificant in the urban model 3 and the rural-urban model (see Table 4 and Table 5). This pinpoints that road infrastructure could reduce the average income inequality in urban areas but not in rural and rural-urban. Income per capita as a control variable consistently reduces income inequality in rural, urban, and rural-urban areas.

Furthermore, the control variable that significantly reduced income inequality in urban areas and throughout the province was health infrastructure—the mean years of schooling variable only had a significant effect at the whole province level. The variables of women's empowerment and economic openness only had a significant effect in urban areas.

The results of evaluating the Kuznets' curve model of income inequality in Indonesia by provincial level and rural existed without control variables. Also, they existed with control variables for rural, urban, and rural-urban models. The income threshold could be achieved at IDR 27.80 million in rural, IDR 38.62 million in urban, and IDR 37.72 million in the sub-national average level in achieving welfare when income inequality started to decrease. It highlights that the level of income distribution started to improve when the average level of per capita income in each region reached the threshold level during the study period. This condition also illustrates opportunities to improve community welfare through regional economic activities.

The results of Kuznets' hypothesis testing showed a number of differences between rural, urban, and provincial averages. The differences in the evaluation results between rural and urban areas were caused by higher income inequality in urban areas compared to rural areas in 2012 – 2021. In addition, the Kuznets curve inequality model estimation in rural areas did not include the inequality data for Jakarta Province since it did not have rural areas. Another reason, as stated by Kuznet (1955), was the alteration from low-productivity agriculture to more productive sectors such as manufacturing and services during the growth process. Consequently, inequality widened in urban areas and decreased in rural areas. The findings of this study were in line with the research by (Aktas & Iyidogan, 2022; Sidek, 2021; Tadjoeddin, 2013).

We showed that fiscal transfers significantly reduce income inequality in rural, urban, and rural-urban areas. The instruments for fiscal transfers to the regions were in the form of general allocation funds and special allocation funds, where special allocation funds to the province are strongly related to the declining income inequality at the regional

level, while general allocation funds do not, although there was a positive relationship between them. This condition illustrates that the general allocation funds transferred to the province cannot redistribute income directly to the community, given the fact. Bearing in mind that the general allocation funds implemented by the government are for equal distribution of provincial financial capabilities, thereby reducing gaps in provincial funding sources and fiscal gaps between provinces in the context of meeting regional needs in decentralization. It means that general allocation funds could not increase people's income in rural, urban, and rural-urban areas. This result differs from previous studies, which found that fiscal transfer policies can reduce income inequality among residents in rural, urban, and rural-urban areas (Kyriacou et al., 2017; Ong et al., 2023). Another study that did not confirm these results was conducted in South America by Clifton et al. (2017), which showed that fiscal policy has been proven to reduce income inequality in the region. However, these results confirmed previous research findings that the relationship between fiscal decentralization policies and inequality was weak (Canare et al., 2020).

The special allocation fund significantly reduced income inequality in rural, urban, and rural-urban areas. In other words, there was an increase in special allocation funds, thereby reducing income inequality. This study has proven that one of the keys to reducing income inequality was increasing government budget allocations through the mechanism of special allocation funds. The results of this study are consistent with the study of Enami et al. (2019), which found that the fiscal transfer system was both directly and indirectly effective in reducing the Gini income inequality index in Iran. Also, the findings of this study confirmed previous findings revealing that the decentralization of fiscal revenues is negatively correlated with income inequality in urban, rural, and rural-urban areas (Chen et al., 2020; Deyin et al., 2017). Qomariyah et al. (2019) specifically emphasized that special allocation funds may reduce income inequality. In addition, Su et al. (2019) concluded that fiscal decentralization impacted increasing population income and fiscal spending, encouraging income growth for urban and rural residents. However, the growth rate slowed over time. Meanwhile, other researchers have also emphasized that fiscal decentralization is an important determinant that significantly reduces inequality (Makreshanska-Mladenovska & Petrevski, 2019).

However, the empirical results of this study did not confirm any research findings highlighting that decentralization increases inequality (Saputra, 2012; Sepulveda & Martinez-Vazquez, 2011). A similar research finding also articulated that fiscal decentralization did not impact income inequality (Cevik & Correa-Caro, 2020; Fan et al., 2020). Likewise, Mudayen & Maridjo (2017) also found an inverse relationship between special allocation funds and income inequality between provinces in Indonesia. The special allocation fund for assignment supports accelerating the development of basic service infrastructure focused on priority locations (sub-districts) in the district/city. The provincial government has a vital role in managing transfer funds from the central government through special allocation funds to accelerate area-based development, namely

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rural and urban areas. Following its designation, special allocation funds aim to accelerate infrastructure development for education, health, road transportation, drinking water, sanitation, housing, and settlements to reduce income inequality in rural, urban, and rural-urban areas. After this, it directly impacts improving the economy and community welfare.

Transportation development is expected to increase public access to ensure the smooth operation of economic activities to increase people's income. Road infrastructure has become the center of attention at the urban, rural, and national levels because of its very influential role in ensuring the mobility of goods and services in the regions. However, the results of this study show different results regarding the effect of road infrastructure on income inequality by region. The research findings have shown that road infrastructure significantly reduced income inequality in urban areas. In other words, improving road infrastructure could reduce income inequality in urban areas. Hence, road connectivity in urban areas was better than in rural areas. The empirical test has confirmed previous findings that transportation infrastructure significantly affected income inequality (Z. Huang et al., 2020; Mishra & Agarwal, 2019).

On the other hand, the results of empirical testing showed that road infrastructure did not significantly reduce income inequality in rural and rural-urban areas. This result means that the improvement of road infrastructure increases income inequality in rural and rural-urban areas. This finding corroborates previous research, which found that road infrastructure improvement does not impact income distribution (Fullerton Jr. et al., 2014). The wealth generated by rural people working in cities is poorly distributed to themselves, exacerbating income inequality within cities (Zhang & Zhang, 2021). Likewise, (Fageda & Olivieri, 2019) showed that massive transportation infrastructure investment reduces the income gap between regions. The results of previous studies in Indonesia with provincial-level data show that an increase in the number of roads widens the income gap in Indonesia (Makmuri, 2017).

Road infrastructure for rural communities is critical to increase their income (Lu et al., 2022). The income received by people in rural areas is starting to approach that in urban areas, so rural residents are also starting to benefit from the provision of transportation infrastructure. On the one hand, the income of the rural population can increase when the excess rural workforce has the option of working in the secondary and tertiary sectors in urban areas (Liu & He, 2019). Hence, it is necessary to improve the quality and quantity of road infrastructure development because it has proven to impact increasing income distribution in urban areas. Road infrastructure development is not merely intended for luxury but serves the basic needs of the community that must be met. Therefore, income inequality between residents shall be reduced through the improvement and addition of proper roads in urban areas because it can increase the income and welfare of people in urban areas. Increasing income may reduce overall income inequality (Chatterjee & Turnovsky, 2012; Liu & He, 2019; Zhang & Zhang, 2021; Zolfaghari et al., 2020). Since Indonesia is an archipelagic country, there needs to be better connectivity between regions in rural areas, thus hindering community access

to economic activities that ultimately lead to longer time for distribution and expensive transportation costs.

As a consequence, this condition has exacerbated income distribution in rural areas. In contrast, urban areas have better connectivity with better, flexible, and accessible road infrastructure to increase income distribution. In addition, the positive impact of urban roads on the Gini coefficient lies in the development of the road network and the urban economy, leading to large numbers of rural people migrating to cities for work. In this case, those living in rural areas become increasingly marginalized, increasing income inequality.

Although research findings have proven that fiscal transfer policy and transportation development reduce inequality in rural, urban, and rural-urban areas, they also added to the consistency of previous findings, indicating some weaknesses. The drawback of this research mainly lies in the measurement of fiscal transfer, which needs to include the tax and non-tax revenue sharing, which is included in the transfer fund. Although the revenue-sharing funds are not as significant as the general allocation funds and special allocation funds, the use of these funds by the regions can be directed at increasing income distribution. In addition, this study also did not include roads under the authority of the central and district/city governments as well as railways. However, the total number of roads in all regions, either both national, provincial, and city districts, as well as railways, has proven to be significant in reducing income inequality (Zhang & Zhang, 2021) since it can increase the economic activities without disturbing people's connectivity in the form of roads. Therefore, it is unsurprising that this research has shown that road infrastructure only contributes to reducing income inequality in urban areas. Another weakness of this study is related to the limited length of the series. Thus, as a consequence, it was not easy to do modeling for data analysis to produce relevant analysis.

CONCLUSION

This study uses the GLS fixed effect panel based on time series data from 2012 to 2021 in 34 provinces to examine the relationship between fiscal transfer policy and road infrastructure and income inequality in Indonesia. The researchers concluded that this research contributes to the development of the existing body of knowledge and inputs of policies to reduce income inequality. The study results have shown that the Kuznets' hypothesis existed in rural and rural-urban areas (without control variables) and all models (with control variables). The main results show that the special allocation fund significantly reduces income inequality in rural, urban, and rural-urban areas. However, the general allocation fund does not significantly reduce income inequality. The government plays an essential role in determining policies to decrease income inequality. In addition, it was also revealed that road infrastructure is a determinant factor in reducing income inequality in urban areas but only in rural areas and rural-urban for some provinces. Developing and improving road transport

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infrastructure does not automatically lead to decreasing income inequality. Hence, the government is suggested to improve the ability of low-income groups in urban areas to utilize transportation infrastructure to increase their income, such as e-commerce and logistics transportation-based economic activities. The government can also minimize the increasing flow of urbanization from rural areas and move the orientation of rural economic infrastructure development to increase people's incomes in rural areas to create an even distribution of economic development.

Referring to the study's limitations in which infrastructure was not significantly correlated with income inequality in rural areas and on a national average, it is necessary to retest by adding different data and analytical models (e.g., System Dynamic Panel). Also, road transportation has ignored rail transportation, which all levels of society have widely used. In addition, the following studies must include land transportation variables in the form of trains in an analytical model to generate more comprehensive analytical results. The regional fiscal transfer policy also needs to address the existence of tax and non-tax revenue-sharing funds to the regions not included in the model in predicting income inequality; thus, future researchers should add tax and non-tax revenue-sharing variables.

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Exchange Rate Pass-Through and Economic Openness Under Inflation Targeting Framework in Asian ITF Economies

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Abstract
This study investigates overall ERPT in four ITF-adopting Asian Economies, emphasizing the trilemma between ERPT, economic openness, and the inflation target. Based on quarterly data observations from 1999 to the fourth quarter of 2022 with an application of combined distributed lag and adaptive expectation models that allows a fair assessment concerning ERPT throughout the time dimension, we reveal evidence that exchange rate changes will be transmitted immediately to increasing domestic prices in the short run. Similarly, increased interest policy, GDP, and trade openness will push consumer prices up in the short term through adaptive expectation mechanisms. However, the pass-through effect tends to decrease in the long run due to a credible ITF implementation. Meanwhile, the pass-through effect concerning trade openness varies across countries in the short run, while openness tends to increase pressures on consumer prices in the long run. This condition allows further investigation to examine the pass-through effect and its transmission to various prices, including prices, imports, export prices, economic structure, and the effect of fear of floating in the ITF.

Keywords:
exchange rate pass-through; inflation targeting framework; trade openness; distributed lag; adaptive expectation

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INTRODUCTION

Asian economies encountered volatility in global capital flows due to the Asian financial crisis in 1997, prompting them to transition to a floating exchange rate system (Calvo and Reinhart, 2002). With the widespread adoption of the floating exchange rate regime, the inflation targeting framework (ITF) emerged as a prevalent topic for monetary policymakers (Prasertnukul et al., 2010). Although the monetary authority does not directly control the exchange rate of the domestic currency, exchange rate movements still have profound implications for the monetary policy framework through inflation.

Following the currency crisis in 1997, Korea became the pioneer in Asia to embrace inflation targeting. Regarding exchange rate policy, Korea eliminated the daily range of exchange rate fluctuations in 1997, transitioning to a complete currency floating regime. The Central Bank of Indonesia partially adopted the ITF in January 2000 after amending the Central Bank Act in 1999 but only officially completed the ITF in mid-2005. Beforehand, the currency crisis had intensified speculative attacks in both money and foreign exchange markets, compelling authorities to permit the Rupiah currency to undergo free floating arrangments in August 1997. The Bank of Thailand (BOT) switched its monetary policy framework from monetary targeting to inflation targeting in May 2000, two years after the shift from a fixed to a floating exchange rate. The last one that adopted the ITF was the Phillippines, which adopted ITF in January 2002 after two years of preparation.

The ITF aims to reduce the loss function attributed to the actual deviation of inflation from its target using instruments such as alteration in interest rates. However, since ITF's introduction until now, there have been several challenges the central bank has been confronting in carrying out the policy framework. Among these challenges are imperfect policy credibility, fiscal dominance, exchange rate volatility, and financial system stability's role in conjunction with monetary policy (Agénor & da Silva, 2019). The central bank encountered difficulties embracing a freely floating exchange rate mechanism parallel to ITF. This fear of floating causes a reluctance to execute complete floating, which in turn creates a challenge for the optimal functioning of ITF, including limited policy flexibility, increased vulnerability to external shocks, and reduced policy credibility (Calvo & Reinhart 2002; Ball & Reyes, 2008). Moreover, the increasingly intense degree of openness and integration of a country's economy into the global economy has augmented the ITF's challenges. The issue of openness and price stability within ITF occupies the center of attention in this study, specifically the extent to which the degree of openness affects the exchange rate pass-through against inflation.

The adoption of ITF is expected to reduce the pass-through of the exchange rate against inflation. In the ITF regime, markets that import goods from abroad tend to absorb most of the exchange rate shock through minor variations in selling prices, isolating its impact on inflation. The price response to exchange rate shocks in the target country has decreased with the ITF, while in non-ITF countries, it has increased (Coulibaly & Kempf, 2010). Nevertheless, there is a bunch of literature that reveals divergent results regarding the influence of exchange rate pass-through on inflation within the context of ITF (Jongrim et al., 2020; Cheikh & Rault, 2016; Phuc & Duc, 2021; Brun-

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Aguerre et al., 2017; Agénor & da Silva, 2019; Prasertnukul et al., 2010). Even in the three pioneer countries that implemented the first ITF, an investigation by Nasir & Vo (2020) found evidence of country-level heterogeneity in the exchange rate pass-through. They showed that a positive shock to the real effective exchange rate led to increased inflation in Canada, contrary to that in the UK. At the same time, New Zealand, the first adopting country of ITF, showed a lower exchange rate pass-through to inflation and trade balance than Canada and the UK. Nasir and Vo (2020) suggested that the divergence results in the three pioneer countries are due to country-level heterogeneity and time variations where if there is something in a certain period, it can happen the other way around. In alignment with Nasir & Vo (2020), Forbes et al. (2017) highlighted nation-specific variations, temporal fluctuations, distinct shock attributes, and structural factors as contributors to variations in ERPT. In addition, Flamini (2007) argued that if ITF reduces ERPT, the effect is endogenously imperfect depending on the level of insulation of the economy from foreign and monetary policy shocks.

Although the results in the empirical tests vary, the ITF is still perceived as an effective policy to target inflation, but with due regard to country-specifics in its policy implementation. Particularly for developing economies, where exchange rate fluctuations often cannot completely absorb the impact of external shocks, attention to exchange rate stability becomes crucial. Moreover, the degree of economic openness in developing countries is increasing, leading to greater integration with the global economy and heightened vulnerability to external shocks.

Traditional ITF believes that ITF reduces exchange rate pass-through to inflation, allowing the markets to absorb most of the exchange rate shocks, and hence, there is no need to adjust the selling price variations. The assertion assumes a complete pass-through, suggesting that increased economic openness contributes to greater pass-through comprehensiveness, reducing the ERPT (Gust et al., 2010). Nevertheless, amidst a substantial body of literature concurring with diminished pass-through in a low inflation context post the embrace of inflation targeting across numerous nations, empirical findings also indicate divergent pass-through extents contingent upon the size and the direction changes of the exchange rate (Tunc, 2017). Besides, the source of exchange rate changes emerges as a critical issue for the differential pass-through that requires observing the disaggregated price data. Brun-Aguerre et al. (2017) revealed an asymmetric pass-through for currency appreciations and depreciations into import prices. They found that depreciations are more strongly pass-through than appreciations in the long run. The asymmetric effect is stronger in more import-dependent than less-dependent economies. Therefore, global economic disruptions, including exchange rate pass-through, wherein alterations in exchange rate impact processes across the supply chain, emerge as the challenge to attaining the inflation target (Phuc & Duc, 2021).

When it comes to policy execution, particularly within developing economies, preserving a steady exchange rate is regarded as the pivotal element in upholding price stability. Table 1 shows the correlation between nominal exchange rate and consumer price changes. By designating the 2008 global financial crisis (GFC) as the cut-off point, the observed association between exchange rate fluctuations and inflation rate alterations

within four nations that embraced ITF appears to rise when examining the periods preceding and succeeding the GFC. The relationship between exchange rate fluctuations and inflation, previously characterized by a relatively modest connection before the 2008 GFC, underwent a substantial increase post-GFC. This indicates an increase in ERPT against inflation in those countries.

Table 1. Correlation Between Exchange Rate Changes and Consumer Price Changes

	1999 to 2007	2008 to 2022
Indonesia	-0.10901	0.278638
Korea	0.054897	0.205608
Thailand	0.109398	0.111604
The Philippine	-0.13119	0.262992

Another intriguing feature worthy of observation pertains to the alteration in the correlation direction between fluctuations in the exchange rates and inflation in Indonesia and The Philippines. 2008 GFC has altered the direction where domestic currency depreciation is associated with higher inflation post-2008 GFC. It is of particular interest to further investigate this asymmetrical impact, whether this heightened indication of ERPT is a result of shifts in the economic structure in response to the distinct shocks as elucidated by Phuc & Duc (2021), Forbes et al. (2017), Nasir et al. (2020) and Brun-Aguerre et al. (2017) or whether it can be attributed to the degree of economic openness and its sensitivity to external and monetary policy shocks as expounded by Flamini (2007) or the extent to which small open economies depend on their trading partners investigated by Chua (2018).

Unlike Flamini (2007), Gust et al. (2010) argued that an economy's degree of openness to the global market inversely correlates with the magnitude of Exchange Rate Pass-Through (ERPT). With increased trade integration, exporters have become more responsive to the prices of their competitors. Foreign exporters find it optimal to vary their markup in response to shocks that change the exchange rate, insulating import prices from exchange rate movements and lessening ERPT against inflation. The proposition Gust et al. (2010) put forward was congruent with the conclusion drawn by Coulibaly and Kempf (2010), who examined the responses of ERPT to pricing and determined that the implementation of ITF with higher openness leads to a reduction in pass trough effect affecting consumer, import and producer prices.

This paper investigates the nexus between the degree of openness and its impact on the ERPT within four ITF-adopting countries in Southeast Asia. Associating economic openness with ERPT remains an area that warrants further exploration, especially in developing economies. Furthermore, this paper will provide additional insights into how the level of openness impacts Exchange Rate Pass-Through (ERPT) within the four ITF-adopting economies in Asia. The mechanism through which alterations in exchange rates lead to price adjustments can be delineated into two distinct pathways. A direct pass-through involves changes in the cost of imported goods due to a shift in exchange

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rates. When the domestic currency depreciates, the cost of imported goods denominated in foreign currency increases, leading to higher prices for imported products in the domestic market. An indirect pass-through is a channel through which exchange rate fluctuations affect prices through changes in competitiveness and shift domestic demand. Domestic currency depreciation can make domestically produced goods relatively cheaper for foreign consumers, boosting export demand. It can prompt consumers to switch from imported goods to domestic substitute goods. This substitution can influence the prices of domestically produced items, extending its impact beyond goods associated with imports (Hüfner & Schröder, 2005).

In addition to the significance of this research by linking it to increasing economic openness, this research contributes to the ERPT literature in terms of its comprehensive observations with the time dimension since the ITF was implemented until the most recent time. This provides a fair assessment with respect to the empirical literature body, where the results vary due to the varying time dimensions of the observations.

METHODS

We modify a single equation of the ERPT model developed by Campa and Goldberg (2005) as follows:

$$\Delta CPI = \tau + \sum_{0}^{4} \beta_i \Delta ER_{t-i} + \rho \Delta GDP_t + \gamma \Delta IR_t + \delta \Delta TS_t + \varepsilon_t \quad (1)$$

where *CPI* is the consumer price index, *ER* is the nominal exchange rate, *GDP* is real GDP, and *TS* represents trade openness as a ratio of trade (export plus import) to the GDP.

Unlike Campa & Goldberg (2005), who used import prices as the dependent variable per the underlying standard ERPT theoretical framework, we use consumer price as the dependent variable. This considers the concerns of this research regarding ERPT in the context of ITF and economic openness. Consequently, we include the policy interest rate *(IR)* and trade share *(TS)* variables as the explanatory variables against consumer prices.

The empirical model takes the first-differenced form to address the non-stationarity issue. ERPT identification is carried out by looking at the coefficient β_i which also shows price elasticity in response to changes in the exchange rate over the horizon. The short-run ERPT is given by β_0, while the long-run ERPT is given by $\sum_0^4 \beta_i$. Equation *(1)* estimate uses quarterly data; hence, the parameter estimates would provide "ERPT five quarters later" as it captures the accumulated impact of shocks over five consecutive quarters. The approach is widely applied in the literature (Aron et al., 2014). The estimation of equation *(1)* accomplishes a structural analysis of the ERPT and the factors expected to explain the short-run and long-run ERPT in the context of ITF and economic openness.

This model can be said to be a combined model between distributed lag and adaptive expectation. The effects of exchange rate changes on price changes are distributed periodically over four quarters since the occurrence of exchange rate shocks, and these effects decay exponentially from the first quarter to the fourth quarter. Hence, the coefficients $\sum_0^4 \beta_i$ decreases exponentially following the pattern as expressed in the following equation:

$$\beta^i = \beta_0 \lambda^i \tag{2}$$

where λ^i is the rate of decay of the distributed lag and lies between 0 to 1. The long-run effect of ERPT is defined as $\sum_0^4 \beta_i$ following Koyck's (1954) rule where (Gujarati, 2003):

$$\sum_0^4 \beta_i = \frac{\beta_0}{1 - \lambda^i} \tag{3}$$

At the same time, the effect of changes in GDP rates, policy rates *(IR),* and trade share *(TR)* on changes in consumer prices *(CPI)* follows an adaptive expectation pattern where:

$$\Delta\omega'_t = \phi'(\omega'_t - \omega'_{t-1}) \tag{4}$$

with ω' is a vector of explanatory variables that include *GDP*, *IR,* and *TS,* respectively, and the parameter ϕ' denotes the coefficient of expectation, which lies between 0 and 1.

The subsequence method is carried out to portray the dynamic pattern of ERPT in each ITF-adopting economy. Following Forbes et al. (2018), García-Cicco & García-Schmidt (2020), and Yilmazkuday (2022), the dynamic pattern of ERPT is obtained from the Cholesky decomposition of μ as follows:

$$ERPT\ (n) = \frac{\sum_{i=1}^{n} \mu_{ER}^{cpi}}{\sum_{i=1}^{n} \mu_{ER}^{ER}} \tag{5}$$

Where $ERPT\ (n)$ represents the reaction of consumer prices in response to changes in the exchange rate for n periods ahead; $\sum_{i=1}^{n} \mu_{ER}^{cpi}$ is the cumulative impulse response of consumer price *(CPI)* to the exchange rate *(ER)* shock and $\sum_{i=1}^{n} \mu_{ER}^{ER}$ is the cumulative changes in the *ER* in response to the shock associated with the *ER*. The ERPT is then the ratio of the cumulative percentage change in *CPI* relative to that in ER, originated by the shock associated with *ER*. The Cholesky decomposition to generate ERPT is based on the simple quarterly model of bivariate *CPI-ER* vector autoregression (VAR) where μ denotes the innovation variable in the VAR system as follows:

$$x'_t = \alpha + \sum_{k=0}^{k} \beta_k x'_{t-k} + \rho\delta'_t + \mu'_t \tag{6}$$

where x' is a vector of variables that are assumed to be endogenous and x' consists of ER, CPI, GDP, and TS. δ' is a vector of control variables that are exogenous, and μ' is a vector of residuals. The dataset used for estimating equations one through three was sourced from international financial statistics (IFS).

Estimating a set of empirical models is based on quarterly data for each country, with a time dimension from the fourth quarter of 2005 to the first quarter of 2023 for Indonesia. Meanwhile, for Korea, the estimate is generated based on observations ranging from the 1999 third quarter to the 2023 first quarter. The estimate for Thailand is based on observations from the 2002 third quarter to the 2022 third quarter. Finally, the Philippines estimate was generated based on observations ranging from 2000 in the second quarter to 2022 in the fourth quarter. This time span marks the implementation of ITF from the beginning until the latest data available in each country.

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RESULTS AND DISCUSSION

Table 2 shows the estimation results of the ERPT model in equation (1) using a full sample of quarterly data from the beginning of ITF implementation until the most recent data available for each country. The coefficient estimates displayed in Table 2 portray a short-run behavior of consumer price changes against ERPT and other variables whose mechanism through which they influence consumer price changes is the adaptive expectation mechanism. The coefficient estimate for ΔER in all countries, representing how changes in consumer price react to changes in exchange rates, shows a positive direction. This suggests that consumer prices tend to increase in the short horizon when the domestic currency depreciates. However, the coefficients for Indonesia and the Philippines are not statistically significant.

Table 2. Estimates of the Distributed Lag-Adaptive Expectation Model

	Indonesia	Korea Republic	Thailand	Philippine
Constant	1.408235***	0.531408***	0.473726***	0.899823***
ΔER	0.000253	0.003042***	0.170458*	0.100219
ΔER (-1)	-5.81E-05	0.002597**	-0.139062	0.105250*
ΔER (-2)	-0.000177	0.000955	-0.091712	-0.042545
ΔER (-3)	-0.000239	0.000241	0.114982	-0.081218
ΔER (-4)	4.84E-05	8.36E-05*	0.075886	-0.046951
ΔGDP	7.02E-10	1.13E-08	5.43E-06**	1.71E-06
ΔIR	0.626418***	0.528988***	0.927131**	-0.000115
ΔTS	-0.097255	0.097756**	0.011254	-0.000567

***) denotes: significant at α = 1%; **) significant at α = 5%; *) significant at α = 10 %.

The adaptive expectation mechanism that requires the coefficients on the *GDP*, *IR*, and *TS* variables to be positive and lie between 0 and 1 is satisfied for Indonesian, Korean, and Thailand ERPT estimates (Table 2). Besides, at least one of three variables deliberating adaptation mechanisms is statistically significant. As for the estimation of the Philippines ERPT, the coefficient on the *IR* and *TS* variables is negative, which means that it does not meet the conditions of the adaptive expectation mechanism. In addition, none of the vector variables expected to capture the adaptive expectation mechanism in the Philippines is statistically significant. Therefore, the adaptive expectation mechanism of how GDP, policy rate, and trade share influence changes in consumer prices applies in Indonesia, Korea, and Thailand.

The ERPT, which essentially measures the extent to which changes in exchange rates are transmitted to consumer prices, appears on the magnitude of the coefficient (ΔER). In the short term, ERPT is indicated by β_0, while in the long run, ERPT is indicated by of $\sum_0^4 \beta_i$. Nevertheless, given that $\sum_0^4 \beta_i$ are not statistically significant for all countries, one can infer that the pass-through effect decays in the long run, suggesting that changes in consumer prices will respond to changes in exchange rates during the short period until a certain point. The estimation of equation (5) based on the structural VAR in equation (6) confirms this conclusion. As shown in figure 1, consumer prices respond to shocks in exchange rate changes relative to cumulative responses of shock

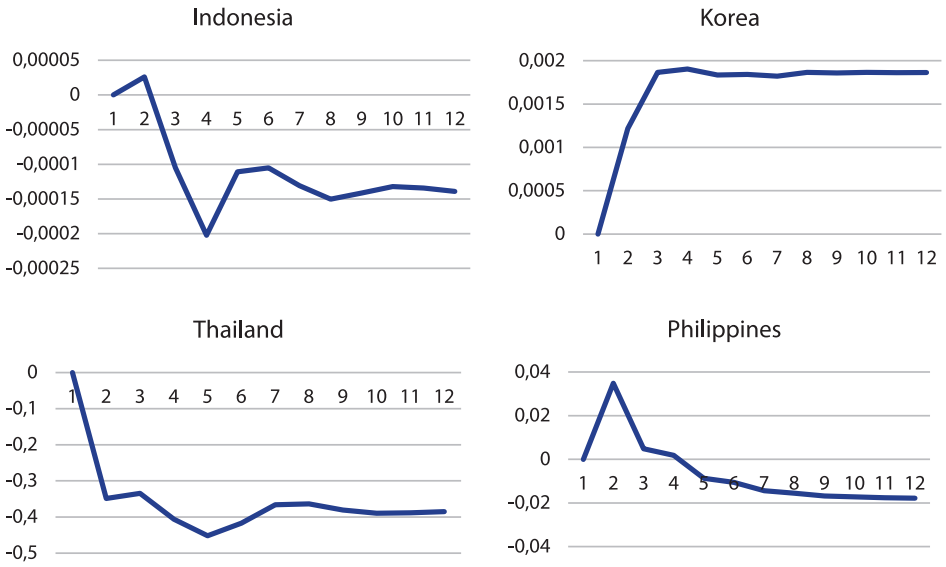
associated with the exchange rate several periods after the shock with a tendency to increase prices. That is, there is a point where the ERPT fully decays. At this point, consumer prices are in equilibrium at a new level, either higher (Korea) or lower than the initial level before the exchange rate shock (Indonesia, Thailand, and the Philippines).

We also estimate the linear model of how consumer price is explained against its explanatory variables representing the long-run equilibrium. The estimate of the long run-specification is also aimed at a robustness check shows in equation (7). The estimate for equation (7) is shown in table (3).

$$CPI = \varphi + + \sigma GDP_t + \eta IR_t + \kappa TS_t + \nu_t \quad (7)$$

With the *TS* variable for Indonesia as an exception, all variables in the long-run estimation have statistically significant impacts in explaining consumer price changes. It suggests that the model specifications developed in this paper are robust in terms of the underlying theoretical framework. In this case, the estimate of the long-run model specification shows the long-run equilibrium of the consumer prices against its explanatory variable, irrespective of the short-run model estimates, which indicate disequilibrium conditions (See Pesaran, 1997; Hendry & Richard, 1982).

Figure 1. Estimates of the ERPT based on the Distributed Lag-Adaptive Expectation Model



The analysis carried out in this study is the overall ERPT, in which case the ERPT is directly linked to consumer prices without looking in more detail at import, export, and producer prices. Because the analysis is aimed at the overall ERPT, it is essential to distinguish ERPT in the short run from ERPT in the long run. By differentiating short-run and long-run ERPT and associated with ITF policy and economic openness, this paper detects the final result of ERPT on consumer prices, which is accountable for ITF.

The estimation results presented in this paper confirm previous findings that ERPT behavior in ITF-adopting countries varied depending on country-specific heterogeneity, time variance, and types and sources of shocks in the economy. The estimate of the

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short-run ERPT model results in positive signs of ERPT, indicating that changes in the exchange rate will be transmitted to consumer prices, raising consumer prices in the short run (Table 2). Considering that the parameters are statistically significant for Korea and Thailand, the findings suggest that the impact of the exchange rate on consumer prices, in terms of the pass-through effect, was clear, but not in Indonesia and the Philippines.

Table 3. Estimates of the Long-Run Consumer Price Model

	Indonesia	Korea Republic	Thailand	Philippine
Constant	12.69761**	22.41288***	44.96244***	85.54418***
ER	0.001492***	0.008632***	-0.458698***	-0.217044*
GDP	4.51E-08***	1.09E-07***	2.44E-05***	2.08E-05***
IR	-0.861316***	-0.835616***	-0.719115*	-1.808929***
TS	0.027406	0.428298***	0.152190***	-0.502069***

***) significant at $\alpha = 1\%$; **) significant at $\alpha = 5\%$; *) significant at $\alpha = 10\%$.

These results must be read cautiously, considering that the ERPT model developed in this paper is the ERPT in the context of ITF and economic openness. Thus, these results may unnecessarily conclude that there is an indication of short-run price rigidity in Indonesia and the Philippines in response to changes in exchange rates. It could be that consumer prices react in response to exchange rate changes, but in the context of the ITF, the monetary authority, through its policies, mitigates the impact of exchange rate changes on consumer prices. The coefficient of *IR* in the long run estimate with a negative sign supports this intuition, meaning that a higher policy interest rate mitigates consumer price changes in the long run, as can be seen in the robustness check of Table 3. As explained by Ha et al. (2020), the ERPT tends to decrease in countries with a combination of a free-floating foreign exchanger regime and a credible ITF implementation, where central bank independence can greatly facilitate the task of stabilizing inflation by using the exchange rate as a buffer against external shocks and raising the policy rate simultaneously. Similarly, Prasertnukul et al. (2010) have conveyed that implementing ITF will help countries reduce the pass-through effect of the exchange rate changes on consumer prices.

However, in the short run, the effect of policy interest rates escalates consumer prices through an adaptive expectation mechanism, whereby economic agents will immediately react to interest rates upward alteration by the monetary authority by raising prices (Table 2). This becomes a significant contribution of this research to the literature on ERPT. Given the positive pass-through effect of the exchange rate on consumer prices, this not only underscores a crucial finding within this research but also presents a significant consideration for the central bank, wherein interest rates serve as the primary policy tool to target inflation. This observation suggests that when the central bank increases the policy rate to counter inflationary pressure, it is plausible that workers and producers could foresee the likelihood of further price increases. Consequently, they might modify their future actions, such as workers negotiating for higher wages and producers setting higher selling prices.

Similarly, when looking at trade shares. The impact of trade openness on consumer prices takes a different direction in the four economies, where Korea is the only nation

by which trade openness statistically significantly impacts consumer prices, while the others lack statistical significance (Table 2). This finding implies that consumer prices in Korea are sensitive to trade openness in the same direction. However, trade openness seems to have an impact on consumer prices in the long run, with the Philippines as an exception, as indicated in the robustness check of Table 3. The direction through which trade openness impacts consumer prices is that the more intense an economy gets involved in global trade, the higher the ratio of exports and imports to its GDP, and the more sensitive consumer prices to go up in the long run. This finding implies a critical insight into the empirical literature on ERPT. First, similar to Phuc and Duc (2021), we found various patterns concerning the effect of openness on inflation over the pass-through effect in the short run. It implies that even within an inflation-targeting framework, the effect of trade openness on consumer prices is unclear in the short term. Second, there exists a one-way connection between trade openness and consumer prices in the long term, in the sense that the more open an economy is, the more sensitive the prices of domestic goods are to shift upward. This highlights an incomplete pass-through effect, as has been recognized in earlier research works (See Flamini 2007; Phuc and Duc, 2021; Aron et al., 2014).

Further investigation needs to be carried out to see how this openness impacts consumer prices by looking at the impact on import, export, and producer prices distinctively, conditional on the economic structure. This is because changes in the exchange rate will be responded differently by economic agents. The depreciation of the domestic currency will directly affect consumer prices through the import price channel. Meanwhile, the same depreciation will also affect producer prices through rising production costs due to rising prices of imported intermediate goods. The depreciation of the domestic currency will also affect producer prices and how much a producer sets the margin level given the market structure.

Concerning the response of consumer prices to changes in GDP, the estimation results show that through an adaptive expectation mechanism, positive changes in GDP will push prices up in the short term. For all countries, the coefficient estimate is positive, although only the Thailand estimate produces a statistically significant estimated coefficient (Table 2). In this case, economic agents will react to the business cycle and anticipate the future where GDP is taken as the factor for workers to negotiate wages; firms take the increase in national income as information of rising future purchasing power and demand and, therefore, anticipate by increasing prices. The robustness test through the long-run equation confirms a positive relationship between changes in GDP and consumer prices. The estimation parameters for all countries are positive and statistically significant (Table 3).

CONCLUSION

This paper contributes to the empirical literature on ERPT by investigating an overall ERPT using combined distributed lag and adaptive expectation models. Using a quarterly database from the beginning of the implementation of ITF to the current period, we capture the effects of ERPT over a complete time horizon throughout ITF implementation. Several noteworthy findings emerge from the study; notably, the pass-through effect on consumer price changes exhibits distinct variation across individual economies, with an inclination wherein exchange rate alterations tend to escalate consumer

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prices in the short time horizon. However, the pass-through effect will decrease in the long run in line with an effective implementation of ITF. The short-term pass-through effect occurs through an adaptive expectation mechanism where economic agents will respond to domestic currency depreciation, increased GDP, trade share, and even increased policy rates by adjusting prices upward. However, in the long run, the effect of policy rates will reduce the pressure on consumer prices through the pass-through effect.

Another pivotal finding in this study pertains to the influence of economic openness, which appears to exert upward pressure on consumer prices. This finding contrasts the theoretical presumption that economic openness will lower consumer prices through production chain and competition channels. It suggests that the monetary trilemma is an issue that is still relevant in these countries. On the one hand, policy interest rates effectively control prices in the long term. On the other hand, openness with a floating exchange rate system increases consumer prices. It suggests that policymakers are supposed to strengthen the policy mix and shift the policy framework from flexible to integrated inflation targeting.

Further investigation is needed by analyzing the pass-through effect on prices in more detail, including import, export, producer, and consumer prices. An investigation also needs to be carried out regarding the possibility of fear of floating in small open economic countries within a perspective of the trilemma between free exchange rates, economic openness, and inflation targets.

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The Role of Export in Boosting Indonesia's GDP during Crisis: Macroeconomic Conditions

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Abstract

Research examining the determinants of export activities affecting economic growth during the pandemic is gaining global interest, particularly in Indonesia, which recently reduced its fuel subsidy as a unique case in this field. Hence, this study examines the role of export and macroeconomic conditions, including fuel price, exchange rate, and interest rate, in boosting Indonesia's GDP during the crisis. We examine this relationship by conducting a structural equation model and path analysis on secondary data from 1995-2022. The result shows that both partially and simultaneously, fuel prices, exchange rates, and interest rates significantly affect exports. On the other hand, an increase in export activity improves Indonesian GDP. Thus, simultaneous control of fuel prices, exchange rate, interest rate, and export value can improve Indonesian GDP growth even during the crisis. Based on this result, this article proposes suggestions to the government for a stable fuel price, exchange rate, interest rate, and government policy to promote future economic growth.

Keywords:

economic growth; fuel price; exchange rate; export; gross domestic product

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INTRODUCTION

For the last thirty years, Indonesia has been striving to improve development cooperation through various means available. This effort is implemented by improving the national status and identity through international events and global countries incorporated in the G20 (Dal & Dipama, 2019). Furthermore, encouraging non-fossil fuel export has affected the Gross Domestic Product (GDP) expansion through fuel price and currency exchange rate stabilization (Douvan, 2019) through fuel subsidy elimination, which leads to rising raw material cost, auxiliary material cost, and cost of capital (Chandrarin et al., 2022; Heriqbaldi et al., 2022). This condition encourages the Bank of Indonesia to exercise stringent control on foreign currency exchange rates and interest rates to maintain the stability of imported fuel prices (Mukhlis et al., 2020). The growth of non-oil and gas exports, affected by the current unstable fuel price, exchange rate, and interest rate, resulted in GDP growth of minus 3.46 percent during the 2020 crisis.

Table 1. Fuel Prices, Exchange Rates, and Export 2012-2022

Year	Fuel Price (IDR)	Growth (%)	Exch. Rate (IDR)	Growth (%)	Export (M)	Growth (%)	GDP (M)	Growth (%)
2012	4,500		9,400		153,043.10		8,319,127.94	
2013	6,500	44.44	11,977	27.41	149,918.80	(2.04)	9,192,837.78	10.50
2014	8,500	30.77	12,440	-	145,961.10	(2.64)	10,688,792.04	16.27
2015	7,600	(10.59)	13,795	10.89	131,791.80	(9.71)	11,673,530.08	9.21
2016	6,450	(15.13)	13,436	(2.60)	132,080.90	0.22	12,546,336.00	7.48
2017	6,450	-	13,548	0.83	153,084.00	15.90	12,700,306.00	1.23
2018	7,000	8.53	14,481	6.89	162,841.00	6.37	14,991,200.00	18.04
2019	7,650	9.29	13,900	(4.01)	155,893.80	(4.27)	15,992,460.00	6.68
2020	6,450	(15.69)	14,037	0.99	181,304.49	16.30	15,439,815.00	(3.46)
2021	7,800	20.93	14,269	1.65	219,362.10	20.99	16,996,538.91	10.08
2022	10,000	28.21	15,731	10.25	379,176.00	72.85	18,099,867.94	6.49

Source: Bank of Indonesia (2022)

The rise in fuel prices affects other sectors because fuel has become the driving force of economic activities and is a crucial input in production. Currently, fossil fuels (oil) become the primary inputs, particularly for generating electricity, fueling production machinery, and transporting products to the market. A rise in fuel price will increase the overall production cost, leading to a higher selling price of a product in the market (Balta-Ozkan & Watson, 2017). Other than fuel price increases, a country's currency exchange and interest rates also affected exports (Spahiu & Durguti, 2023).

Indonesian GDP has both positive and negative traits. Regarding positive traits, Indonesian GDP depends on the domestic economy, which is only slightly affected by international conditions. On a negative note, the Indonesian GDP tends to record a decrease in the contribution of the trade surplus. This condition leads to a trade balance

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deficit due to the massive number of imported products that are detrimental to local products today.

Global investors have found new confidence in Indonesia's economic condition; thus, foreign investment remains under government monitoring to measure the investment entering Indonesia (McLeod & Rosdaniah, 2018). However, fuel price contributes to the global inflation rate, leading to a higher production cost and production material price. Following this situation exported products from Indonesia will be less competitive in the international market, resulting in a decrease in exports (Baek, 2021). Indonesia needs help managing the rise of fuel prices due to its high dependency on imported oil fuel, which significantly burdens the national budget. Moreover, the country has to provide fuel subsidies to support its citizens' livelihood, thus resulting in a budget deficit (Badli et al., 2020).

On the other hand, the US dollar exchange rate on global currency directly affects the import value of raw materials, semi-finished goods, and capital, thus increasing production costs and reducing supply (Mandigma, 2019). Because of this, Indonesian products become less competitive, which leads to reduced export prices and value (Ajija et al., 2021). This chain of events contributed to Indonesia's decreased non-oil and gas export growth. It affects Indonesian economic growth, reflected in stagnant GDP growth that can hamper the overall economic expansion.

Additionally, the COVID-19 pandemic and the Russian-Ukraine war have had a significant effect, creating a food and energy crisis, further aggravating price rises, and hampering non-oil and gas exports (Cui & Maghyereh, 2023). Cui & Maghyereh (2023) argued that international trade activities in Indonesia were also affected by the COVID-19 pandemic (Jiying et al., 2020). Meanwhile, the Russian-Ukraine war that started in March 2022 has shifted global economic growth downward. According to the World Bank prediction, the global economic growth in 2021 was recorded at 5.7 percent and was corrected to 2.9 percent in 2022. This crisis leads to weak investment, a situation during the global pandemic faced by all business sectors (Mishra et al., 2020). An increase in the exchange rate will also increase production costs, making national export product prices less competitive than other countries' product prices (Burstein & Gopinath, 2014). The exchange rate also affects Indonesian export activities. A Low currency exchange rate will affect raw material, semi-finished goods, and capital goods import value, which are essential for the Indonesian economy (Gohar et al., 2023; Sarkodie & Owusu, 2021).

Interest rate has also been found to affect export performance indirectly. Spahiu and Durguti (2023) found a relationship between interest rate, export performance, and country GDP. The high-interest rate will also affect production and capital costs, affecting the business's ability to pursue export markets. International trade become a significant part of the global economy. This trade consists of cross-border trade activities, sales of goods to foreign countries (export), and purchase of goods from other countries (import), which are necessary for developing countries (Zheng & Walsh, 2019), including Indonesia. Indonesia has implemented global trade to boost non-oil and gas exports,

which has a huge opportunity to increase the national GDP, especially in the digital era (Gregory et al., 2019).

Export and import growth become an integral part of the activity that supports economic development through GDP growth (Hakim, 2012). Indonesian oil export shows a decrease, encouraging the government to focus on non-oil and gas exports. Restricting palm oil export (non-gas) will increase palm oil farmers and improve community welfare (Mancheri et al., 2019; Shahbaz et al., 2019). Export trade was supported by a sufficient supply chain and international goods shipping efficiency (Khan et al., 2019). The non-oil and gas export includes other mining commodities, processing industries, and agriculture products.

Raw material transportation uses oil-fueled freight, and fuel price increases will significantly affect Indonesian exports. Therefore, effective and efficient energy usage is necessary to develop global business (Osano, 2019). Development program to maintain fuel supply does not hinder export activities in Indonesia (Abdikeev et al., 2019) because of the implementation of effective and efficient means of transportation following the need for the shortest transportation route to save freight costs. This strategy will attract investors to increase their export trade (Paudel et al., 2020).

The oil fuel supply also significantly affects production and community consumption. The government determines oil fuel supply through the Ministry of Energy and Mineral Resources of Indonesia (ESDM) by considering State finances. The government set a policy to manage the fluctuating oil fuel price by reducing fuel subsidies and allocating the funds to other sectors, such as health and education. The national economic growth needs to be improved by increasing oil fuel scarcity and cost (Aucott & Hall, 2014). In the short term, oil price volatility can positively impact Indonesian economic development. The national GDP is highly dependent on the lagging value; thus, it is difficult to predict future economic growth (Hussain, 2020).

The applied exchange rate conversion and provision of the need for raw material import affect the currency exchange rate. The exchange rate refers to the conversion ratio of a currency to another currency from other countries based on the value of the currency. In rupiah, the amount of local currency needed to obtain one unit of foreign currency is enormous. As a developing country and a member of the ASEAN free trade area, Indonesia takes advantage of the available trading facilities to promote higher export levels in this region, which is free from trade restrictions (Iacoviello & Navarro, 2019). The exchange rate is the agreed price between two countries during international trade. The rupiah becomes the preferred means of payment for export and import trade transactions due to its high stability and is used by all countries in cross-country goods transactions. There is a need for a policy to set the rupiah exchange rate as a tool to drive economic growth and to isolate the national economy from global economic turmoil. The fluctuating exchange rate will affect all company transactions, either export-related or import-related.

Aside from the rupiah exchange rate, the need for GDP calculation can be done using three approaches. These approaches are Production-based, Income-based,

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and Consumption-based (Badan Pusat Statistik, 2010). GDP calculation based on consumption or expenditure is calculated from the total output value resulting from household consumption instead of profit-based expenditure, added to government investment and net export value (Iacoviello & Navarro, 2019). The effect of fuel prices on GDP growth can be the decision-making tool for parliament members (Abdelsalam, 2020). A similar case happened to the US economy because of the Katrina and Rita hurricanes in 2005, resulting in natural gas prices reaching the highest point. Natural gas is an important energy source for the US economy, and the price rise has created a significant economic slowdown, particularly in the manufacturing sector that consumes natural gas. This analysis stretched to the macroeconomic sector, where the real GDP growth substantially increased crude oil (Kliesen, 2006). GDP has become an essential indicator in measuring economic conditions and development in a country. GDP can be calculated by the constant or specific price of the added value produced by all business units or as the total value of economic units for goods and service production (Badan Pusat Statistik, 2022).

Previous research states that export positively affects GDP (Spahiu & Durguti, 2023). However, in the short term, export has a negative and non-significant effect on economic growth. To solve this condition, one of the efforts to increase economic growth is by increasing finished goods export trade. Thus, the current study examines the effect of macroeconomic conditions, including fuel price, exchange rate, interest rate, and exports, on Indonesia's GDP during the crisis.

This research contributes to the academic discussion by examining the relationship and effect (both partial and simultaneous) of fuel price, exchange rate, and interest rate on export trade value, which then affects the Indonesian GDP growth during the crisis, to stimulate future economic growth. It is essential to discuss the role of fuel prices and other macroeconomic conditions in this paper, considering that removing fuel subsidies could have an extensive effect on economic activities.

METHOD

The current study analyzed the effect of fuel price, exchange rate, and interest rate on non-oil and gas exports and its impact on Indonesia's GDP during the crisis. The statistical analysis was conducted on secondary data collected from 1995 to 2022 from Bank Indonesia and Central Bureau of Statistics (BPS) and related ministries with 28 observations, as summarized in Table 2. The collected data were analyzed using path analysis on Eviews 10 software to assess its correlation and relationships.

Fuel price was measured from the price of Premium and Pertalite (subsidized fuel in Indonesia), as reported by the Ministry of Energy and Mineral Resources (ESDM). The exchange rate was measured according to IDR to USD middle exchange rate at the end of the observation year, as reported on Bank Indonesia's website. The variable interest rate was measured from the retail interest rate reported on Bank Indonesia's website. Indonesia's non-oil and gas export value was assessed from BPS and is reported

in thousands of USD. The dependent variable of this study, GDP, is reported in trillion of IDR as reported on BPS' website.

Table 2. Collected Data

Year	Fuel Price	Exchange Rate	Interest Rate	Export	GDP
1995	700.00	2,308.000	18.85	37,290.00	389,932.88
1996	700.00	2,383.000	19.22	38,092.90	420,947.42
1997	700.00	4,650.000	21.82	41,821.00	439,751.52
1998	1,200.00	8,025.000	32.15	40,975.00	381,756.57
1999	1,150.00	7,100.000	27.66	38,873.20	390,200.90
2000	1,150.00	9,595.000	18.46	47,757.40	1,432,916.73
2001	1,450.00	10,400.00	18.55	43,684.60	1,683,805.41
2002	1,550.00	8,940.000	18.95	45,046.10	1,861,687.51
2003	1,550.00	8,465.000	16.94	47,406.90	2,054,570.67
2004	1,550.00	9,290.000	14.12	55,939.20	2,340,092.45
2005	4,500.00	9,830.000	14.5	66,428.36	2,825,104.31
2006	4,500.00	9,020.000	15.98	79,589.04	3,397,400.52
2007	4,500.00	9,419.000	13.86	92,012.40	4,018,202.97
2008	6,000.00	10,950.00	13.6	107,894.23	5,031,436.82
2009	4,500.00	9,400.000	14.5	94,491.70	5,697,977.97
2010	4,500.00	8,991.000	13.25	129,739.50	6,535,537.24
2011	4,500.00	9,068.000	12.4	162,019.50	7,514,516.00
2012	4,500.00	9,400.000	11.7	153,043.10	8,319,127.94
2013	6,500.00	11,977.00	11.86	149,918.80	9,192,837.78
2014	8,500.00	12,440.000	11.86	145,961.10	10,688,792.04
2015	7,600.00	13,795.000	10.75	131,791.80	11,673,530.08
2016	6,450.00	13,436.000	10.5	132,080.90	12,546,336.00
2017	6,450.00	13,548.000	10.25	153,084.00	12,700,306.00
2018	7,000.00	14,481.000	9.95	162,841.00	14,991,200.00
2019	7,650.00	13,900.0000	9.95	155,893.80	15,996,538.91
2020	6,450.00	14,037.0000	8.25	181,304.49	15,439,815.00
2021	7,800.00	14,269.005	8.25	219,362.10	16,996,538.91
2022	10,000.00	15,731.000	8.3	379,176.00	18,099,867.94

Sources: Bank of Indonesia (2022)

This study examined the relationship between independent and dependent variables, as represented in Figure 1.

$Y1 = a + b1X1 + \varepsilon$ .....(1)

$Y2 = a + b2\ X2 + \varepsilon$ .....(2)

$Y3 = a + b3\ X3 + \varepsilon$ .....(3)

$Z = a + b4\ Y + \varepsilon$ .....(4)

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Notes:

Y = Non-oil and gas export is an intervening variable

X1 = Fuel Price

X2 = Exchange Rate

X3 = Interest Rate

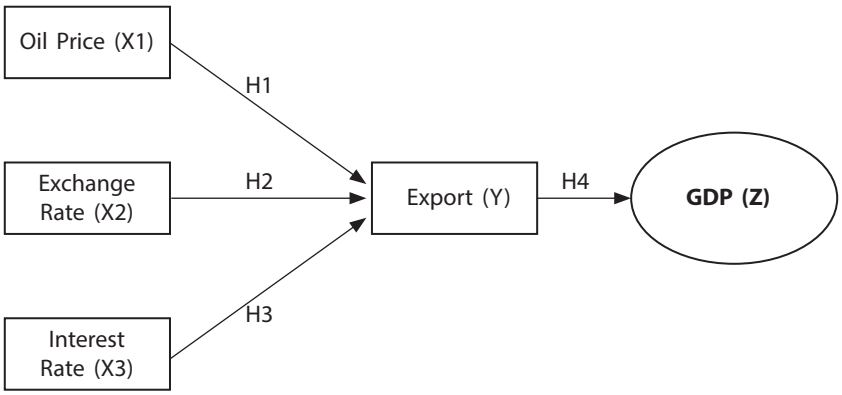
Z = Gross Domestic Products (GDP)

ε = Standard error

The collected data were analyzed through several statistical analyses, starting from the descriptive analysis of the variables, classical assumption test, correlation, and structural equation modeling using path analysis on EViews 10 software. Descriptive analysis of variables aims to examine the group's characteristics and differences (Hair, Black, Babin, & Anderson, 2018). The following test was the classical assumption test consisting of normality, heteroskedasticity, multicollinearity, and autocorrelation, followed by correlation analysis and hypothesis testing.

Path analysis was selected to expand the regression model by examining the correlation matrix and model with arrows signifying the direction of relationships. Path analysis is a statistical approach using bivariate correlation to estimate the variables' relationship in the SEM model (Hair Jr. et al., 2018). Path analysis helps analyze relationships with intervening variables because this approach provides an acceptable way to assess relationships in a complex model (Hair et al., 2018).

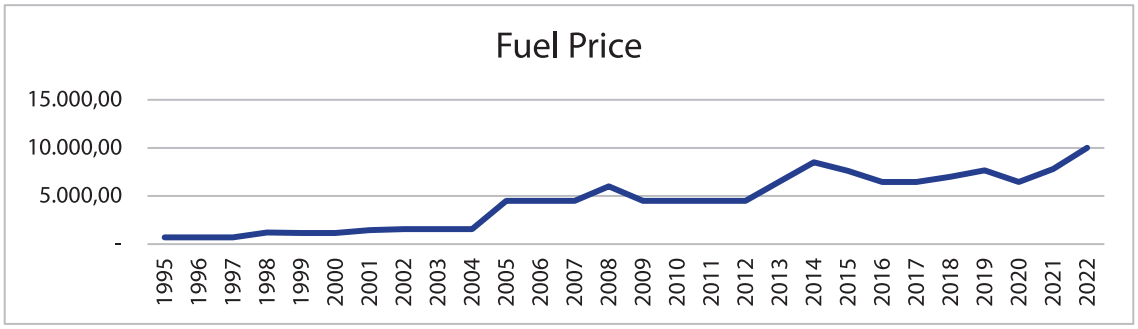
Figure 1. Research Framework



RESULTS AND DISCUSSION

The first analysis conducted in this study is the descriptive analysis of variables consisting of fuel price, exchange rate, interest rate, non-oil and gas export, and Indonesia's GDP, the classical assumption test, correlation, and the SEM analysis showing that fuel price, exchange rate, and interest rate significantly affect Indonesia's non-oil and gas export, which in turn affect Indonesia's GDP in 1995-2022.

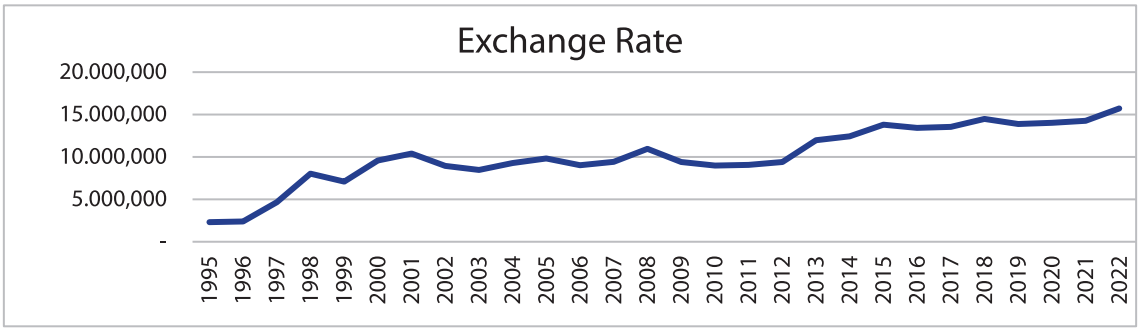
Figure 2. Fuel Price Development 1995-2022



Source: Ministry of Energy and Mineral Resources (2022).

The descriptive analysis revealed that fuel prices in Indonesia fluctuate following the government's decision to reduce the subsidy provided to Indonesians. This decision was taken after the government concluded that the provided subsidy needed to be more effective and reach the intended economic classes. The government found that the subsidy was mostly used by medium to high-income families instead of the poor households, especially the Premium and Pertalite products. Figure 2 summarizes the fluctuation of fuel prices after removing government subsidies after global fuel prices' increasing and declining trend. Significant changes are observable in 2013 (44% increase), 2016 (16% decline), 2022 (28.21% increase). This fluctuation significantly impacts non-oil and gas exports because it affects raw and auxiliary materials and capital goods, including machinery and transportation prices.

Figure 3. Rupiah Exchange Rate 1995-2022 (Bank Indonesia 2022)



The descriptive analysis pointed out that Bank Indonesia's exchange rate monitoring policy based on a free-floating system with strict supervision is appropriate for Indonesia. The Rupiah exchange rate experienced significant changes during 2000-2001 following the 1998 crisis, changing the IDR exchange rate to USD from IDR 1,995 to IDR 2,308 (350.6% increase) and the highest exchange rate of IDR 10,400 (2001) after the crisis. The great 2008 recession caused by US mortgage failure caused another fluctuation and drop in the IDR exchange rate that continued until the Russia-Ukraine war in 2022. IDR recorded the lowest exchange rate in 2022, with IDR 15,731 per USD (a 10.24% drop from 2021). This depreciation significantly affects imported goods that

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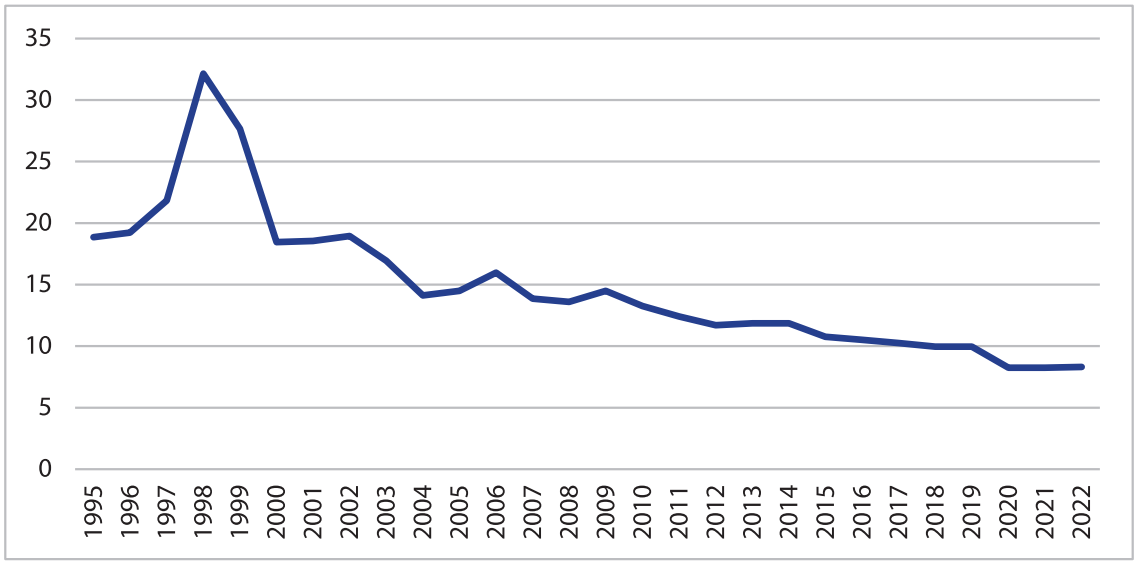
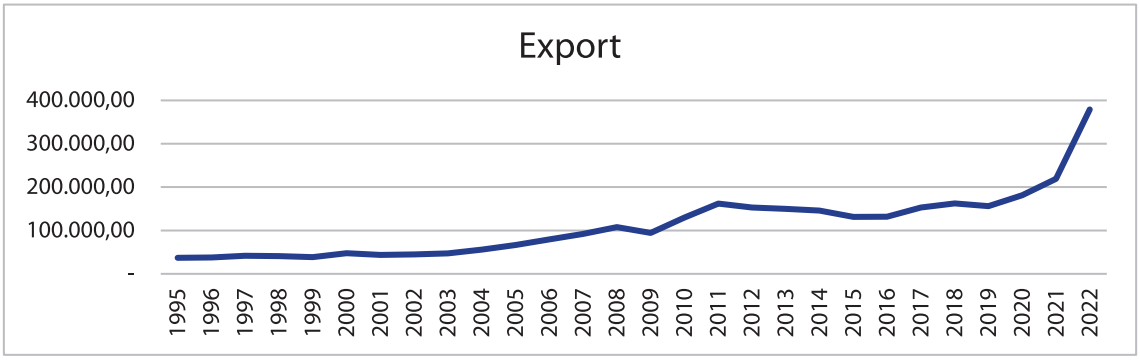
support Indonesia's exports because the country's industry depends on raw materials and machine tools imported from other countries, which is highly sensitive toward the USD exchange rate (see Figure 5).

Figure 4. Interest Rate



The interest rate is the following variable affecting Indonesia's non-oil and gas exports. The descriptive analysis summarized in Figure 4 showed that the interest rate was steadily dropping after the 1998 crisis, in which it reached its highest score in Indonesia's history. The declining interest rate negatively affects Indonesia's non-oil and gas export, which shows steady increases when the interest rate continues to drop.

Figure 5. Development of Non-Gas and Oil Export 1995-2022

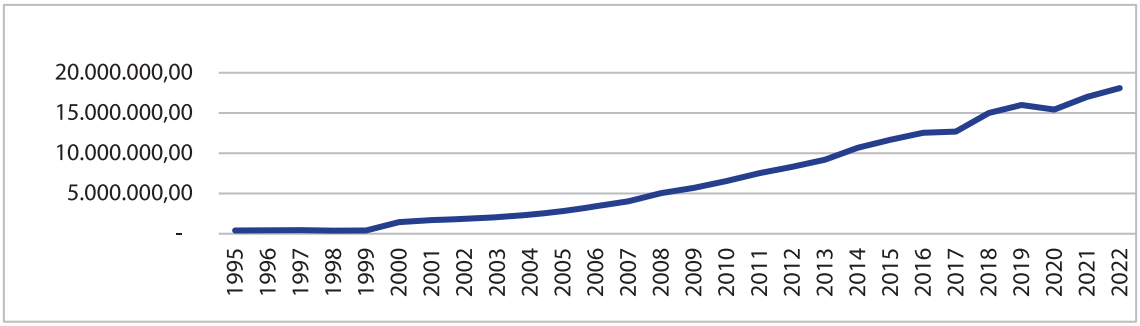


Source: Ministry of Trade of the Republic of Indonesia (2022)

The descriptive analysis of Indonesia's exports exhibited satisfactory growth despite the stagnation at IDR 45,000 trillion from 1995-2004, which slowly increased after the Regional Free Trade Agreement was enacted in 2008. This growth was also affected by the great 2008 recession by 12.44% (from IDR 107,894 to IDR 94.491 trillion).

Fortunately, the government's policy to deregulate permits and global promotion through the Ministry of Trade brought gratifying results with the increasing non-oil and gas exports amid the COVID-19 pandemic and the Russia-Ukraine war. The estimated export value 2022 was IDR 379.176 trillion, 72.80% of 2021 exports (IDR 219.362 trillion). Indonesia's export was boosted by palm oil export to the Netherlands and other countries, leaving domestic demand in jeopardy during the first and second quarter of 2022. The increasing non-oil and gas export is an exciting development that could support Indonesia's GDP growth (see Figure 6).

Figure 6. Indonesia's GDP 1995-2022



Source: Bank of Indonesia (2022)

Descriptive analysis was also conducted on the variable's natural logarithm (Ln) score following Berg et al. (2012) argument that financial and economic data must be processed into Ln before being statistically analyzed to generate relevant research findings. Table 3 summarizes the descriptive statistics of the Ln score for the variables.

The fuel price had its minimum score of IDR 6,551 per liter in 1995 and the highest price of IDR 9,210 per liter in 2022. The mean score for fuel price is IDR 8,099, with a standard deviation of 0.871. The lowest IDR exchange rate to USD was 7.744%, and the highest was 9.663%, with an average exchange rate of 9.145%. The minimum interest rate score was recorded in 2020 and 2021 at 8.25% and the highest in 1998 at 31.15%. The mean interest rate score during the observation period is 14.8725%, showing a declining trend over the years. The minimum score of non-oil and gas export value was 10.520%, with a maximum score of 12.846% and an average rate of 11.424%. The analysis showed that fuel price, exchange rate, and interest rate fluctuation during the observation period affected Indonesia's non-oil and gas exports by 11.424% more than fuel price (8.099%) and exchange rate (9.145%). The GDP growth for 28 years showed a minimum return of 16.711%, with an average of 15.159%. Thus, GDP growth (M 15.159%) is higher than the independent variables (X1, X2, X3) with 11.424%.

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Table 3. Statistics Descriptive

	Ln Fuel Price	LN Exchange Rate	LN Interest Rate	LN Export	LN_GDP
Mean	8.099471	9.144848	2.638306	11.42446	15.15917
Median	8.411833	9.159741	2.619538	11.52259	15.49342
Maximum	9.210340	9.663389	3.470412	12.84576	16.71142
Minimum	6.551080	7.744137	2.110213	10.52648	12.85254
Std.Dev.	0.871745	0.471180	0.347793	0.650877	1.307781
Skewness	-0.580385	-1.824143	0.462564	0.071453	-0.617544
Kurtosis	1.820779	6.129542	2.770398	1.934235	2.108486
Jarque-Bera	3.194274	26.95470	1.060010	1.348990	2.706945
Probability	0.202475	0.000001	0.588602	0.509414	0.258342
Sum	226.7852	256.0558	73.87256	319.8849	424.4567
SumSq.Dev.	20.51838	5.994298	3.265920	11.43829	46.17786
Observations	28	28	28	28	28

To ensure the predictive ability of multivariate analysis, an analysis model needs to meet the classical assumptions (Hair et al., 2018). The classical assumptions in the current study were assessed using the BLUE (Best Linear Unbiased Estimator) test that showed normal distribution of data (Kolmogorov Smirnov. 0.200 > 0.05), free of heteroskedasticity (Glejser test > 0.05), multicollinearity (R score > P partial: 0.854 > 0.838 > - 0.158), and autocorrelation (Run Test 0.178 > p-value 0.05). Therefore, the research model met the classical assumption test, and further analysis can be conducted for the model. The first analysis conducted on the variables is the correlation and regression analysis to check the relationship between the variables.

Table 4. Simple Regression X1 to Y

Variable	Coefficient	Std. Error	T-Statistic	Prob.
C	5.846720	0.460783	12.68866	0.0000
LN_Fuel_Price	0.688655	0.056575	12.17234	0.0000
R-squared	0.850717	Mean dependent var		11.42446
Adjusted R-squared	0.844975	S.D. dependent var		0.650877
S.E. of regression	0.256271	Akaike info criterion		0.183585
Sum squared resid	1.707543	Schwarz criterion		0.278742
Log-likelihood	-0.570190	Hannan-Quinn criteria.		0.212676
F-statistic	148.1658	Durbin-Watson stat		0.708468
Prob(F-statistic)	0.000000			

Table 4 summarizes the simple regression analysis between fuel price and non-oil and gas export. The correlation between the two variables was 0.922, indicating a solid relationship between fuel price and Indonesia's non-oil and gas exports. The t-test for the hypothesis returned t-statistics of 12.172 > t-table 2.060. This result further strengthens

fuel price's positive effect on Indonesia's non-oil and gas exports from 1995-2022. The fluctuation in fuel prices explains an 85.07% variation (R-square 0.8507) in Indonesia's non-oil and gas exports, indicating that a 1% change in fuel price will increase non-oil gas exports by 85.07%. In contrast, the remaining variation is affected by variables outside the model, ceteris paribus (see Table 5).

Table 5. Simple Regression X2 to Y

Variable	Coefficient	Std. Error	T-Statistic	Prob.
C	2.388957	1.733585	1.378044	0.1799
LN_Exchange rate	0.988043	0.189327	5.218701	0.0000
R-squared	0.511598	Mean dependent var		11.42446
Adjusted R-squared	0.492813	S.D. dependent var		0.650877
S.E. of regression	0.463535	Akaike info criterion		1.368880
Sum squared resid	5.586484	Schwarz criterion		1.464037
Log-likelihood	-17.16432	Hannan-Quinn criteria.		1.397970
F-statistic	27.23484	Durbin-Watson stat		0.249223
Prob(F-statistic)	0.000019			

A strong relationship between exchange rate and non-oil and gas export was also observed based on the correlation result of R 0.715. The R square of 0.5116 hinted that the increase of 1% in the exchange rate will contribute to an increase of 51.16% in Indonesia's non-oil and gas export under the ceteris paribus assumption and stable variables outside of the model (see Table 5). Indonesia imports raw, semi-finished, auxiliary, and capital materials to support its non-oil and gas exports. Thus, the IDR exchange rate's strength is significant in supporting the country's exports, as summarized in Table 5.

Table 6. Simple Regression X3 to Y

Variable	Coefficient	Std. Error	T-Statistic	Prob.
C	15.91364	0.406512	39.14680	0.0000
LN_Interest Rate	-1.701537	0.152806	-11.13530	0.0000
R-squared	0.826661	Mean dependent var		11.42446
Adjusted R-squared	0.819994	S.D. dependent var		0.650877
S.E. of regression	0.276148	Akaike info criterion		0.332991
Sum squared resid	1.982703	Schwarz criterion		0.428148
Log-likelihood	-2.661874	Hannan-Quinn criteria.		0.362082
F-statistic	123.9950	Durbin-Watson stat		0.809817
Prob(F-statistic)	0.000000			

Another positive relationship between interest rate and Indonesia's exports is observed, supported by the correlation analysis of R 0.715. This finding is supported by the t-statistic of 39.14680 > t-table 2.060, indicating a positive and significant effect of interest rates on Indonesia's non-oil and gas exports. The R-square of 0.8266 also

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shows that 82.66% of the variation in Indonesia's export is explained by interest rate, meaning that a 1% increase in interest rate will contribute to an 82.66% decline in Indonesia's non-oil and gas export.

Table 7. Multiple Regression X1, X2, X3 to Y

Variable	Coefficient	Std. Error	T-Statistic	Prob.
C	10.66133	1.435704	7.425859	0.0000
LN_Fuel Price	0.435641	0.119053	3.659228	0.0012
LN_Exchange_rate	-0.064305	0.150690	-0.426735	0.6734
LN_Interest rate	-0.825256	0.228194	-3.616458	0.0014
R-squared	0.905800	Mean dependent var		11.42446
Adjusted R-squared	0.894025	S.D. dependent var		0.650877
S.E. of regression	0.211885	Akaike info criterion		-0.133980
Sum squared resid	1.077489	Schwarz criterion		0.056335
Log-likelihood	5.875716	Hannan-Quinn criteria.		-0.075799
F-statistic	76.92552	Durbin-Watson stat		0.636786
Prob(F-statistic)	0.000000			

The following analysis of the simultaneous relationship between fuel price, exchange rate, and interest rate with Indonesia's non-oil and gas export shows a positive relationship with F-statistics of 76.925 > F-table 3., indicating that simultaneously the independent variables affect Indonesia's export. The three variables explain 90.5% of the variation in Indonesia's exports, while other variables are constant.

Table 8. Simple Regression of Y to Z

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.238985	1.632061	-3.822764	0.0007
LN_Export	1.873012	0.142634	13.13162	0.0000
R-squared	0.868978	Mean dependent var		15.15917
Adjusted R-squared	0.863938	S.D. dependent var		1.307781
S.E. of regression	0.482395	Akaike info criterion		1.448642
Sum squared resid	6.050328	Schwarz criterion		1.543800
Log likelihood	-18.28099	Hannan-Quinn criter.		1.477733
F-statistic	172.4395	Durbin-Watson stat		0.475968

The correlation analysis between the intervening and dependent variables returned a solid result of R 0.932. This result is further supported by the t-statistics of 13.1318 > t-table 2.060. The analysis points out the positive and significant effect of Indonesia's non-oil and gas exports and GDP from 1995-2022. The result of the R-square analysis also supports a strong relationship with the R-square of 0.8689, showing that Indonesia's non-oil and gas export significantly contributes to Indonesia's GDP with high market potential abroad. The 1% increase in Indonesia's non-oil and gas exports will contribute

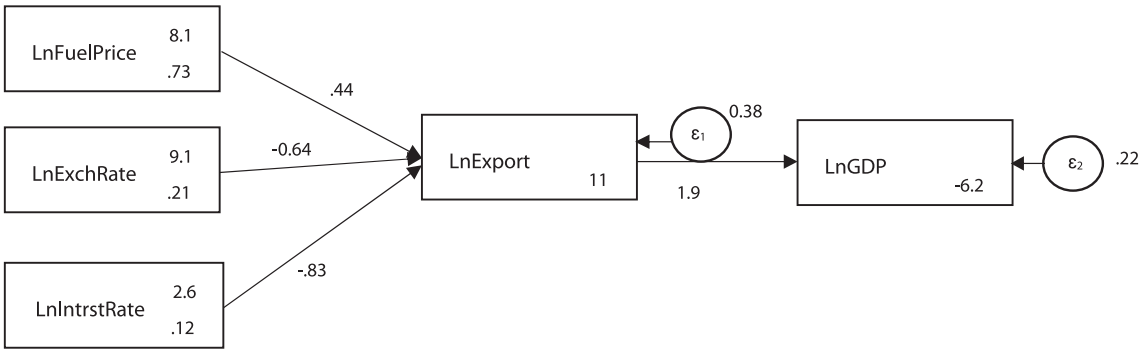
to an 86.89% increase in the national GDP, assuming that other variables remain constant.

SEM testing with path analysis was conducted to examine the simultaneous relationship among the research variables and found that simultaneously, fuel price, exchange rate, interest rate, and non-oil and gas export have a strong effect on Indonesia's GDP with R= 0.977, F-statistic of 251.8768. Partially, fuel price and exchange rate have a positive and significant effect on Indonesia's GDP with t-statistics of 3.223485 and 3.982859 > t-table 2.060. Interest rates negatively affect Indonesia's GDP.

Table 9. Multiple Regression X1, X2, X3, Y to Z

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	10.22212	2.604696	3.924495	0.0007
LN_Fuel Price	0.478550	0.148457	3.223485	0.0038
LN_Exchange Rate	0.601881	0.151118	3.982859	0.0006
LN_Interest Rate	-1.89616	0.283369	-6.691487	0.0000
LN_Export	0.048982	0.203932	0.240189	0.8123
R-squared	0.977681	Mean dependent var		15.15917
Adjusted R-squared	0.973799	S.D. dependent var		1.307781
S.E. of regression	0.211686	Akaike info criterion		-0.106996
Sum squared resid	1.030648	Schwarz criterion		0.130897
Log likelihood	6.497951	Hannan-Quinn criter.		-0.034270
F-statistic	251.8768	Durbin-Watson stat		0.975231

Figure 7. Path Analysis



The first model showed a solid relationship between fuel price and non-oil and gas export (R 0.922) and an 85.07% contribution to non-oil and gas export value variability. This finding indicates that Indonesia's non-oil and gas export is growing despite the increasing production, transportation, and raw material costs. This success is inseparable from the government's role through the Ministry of Transportation, which implements the deregulation of tariffs, siding with the businesses, and is highly expected to contribute to this growing export trend. However, this finding contradicts Kpodar et al. (2022) study that increasing fuel prices negatively affects export growth. High fuel and food

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prices have also adversely impacted economic growth, inflation, and international trade (Hojjat, 2012). In Indonesia, increased fuel price has resulted in dropped commodities export with the depreciation of IDR predicted to contribute to the increasing export of certain commodities in the past (Sato & Damayanti, 2015).

The analysis of the second model revealed a partially solid relationship between the IDR exchange rate and USD on Indonesia's non-oil and gas exports. The analysis revealed a strong correlation (R 0.715) and the ability to explain 51.16% of changes in Indonesia's non-oil and gas exports, noting that the IDR exchange rate has a positive effect. This finding is slightly weaker than the fuel price effect on Indonesia's exports. This finding aligns with Thorbecke & Sengonul (2023), who found a significant effect of exchange rate on export and import in Turkey, and Sundari et al. (2023), who found IDR exchange rate effect on chili export in Indonesia. In Chile, the exchange rate has also been found to predict the return of oil exports (Pincheira-Brown et al., 2022), while in Indonesia, the depreciation of the IDR exchange rate stimulated export in 2015 (Yusuf & Sumner, 2015). It also aligns with Todorova (2022), who states that high exchange rates boost imports while discouraging exports.

The third model examined the relationship between interest rate and Indonesia's non-oil and gas exports, finding a strong correlation (R 0.715) and a negative effect that explains 82.66% of the variation in Indonesia's exports. This result shows the damaging effect of the high-interest rate on the nation's exports. This finding supports Spahiu and Durguti (2023) on the negative impact of interest rates on exports. Das and Biswas (2021) also found the crucial role of interest rates in affecting export and import practices between India and the US, supporting Bhide et al. (2010) that unstable foreign exchange and high interest rates hurt international trade and India's economic growth.

The fourth model analyzed the simultaneous effect of fuel price, exchange rate, and interest rate on Indonesia's non-oil and gas exports. The analysis showed that the three variables explain 90.5% of the differences in Indonesia's non-oil and gas exports. In this model, the exchange rate and interest rate negatively impact Indonesia's exports, indicating that a weak IDR exchange rate against USD and a high interest rate will hurt the national export. These results explain how the IDR exchange rate that reached IDR 15,000 per USD hurt Indonesia's non-oil and gas exports. A high exchange rate equals high production costs due to imported raw materials and capital goods. This finding aligns with Spahiu & Durguti (2023), who found a damaging impact of high-interest rates on export, as well as Thorbecke & Sengonul (2023) and Sundari et al. (2023), who found a significant effect of exchange rate on export. However, despite the negative impact of both variables, Bank Indonesia implemented its supervisory role in the IDR exchange rate well, resulting in Indonesia's growing export post-Covid-19 pandemic and the ongoing Russia-Ukraine war. However, the finding on the positive effect of fuel price on Indonesia's non-oil and gas export contradict the existing literature, which found the negative impact of high fuel price on export performance (Kpodar et al., 2022), which is interesting to examine further considering Indonesia has recently removed the fuel subsidy for two products analyzed in the current study.

The finding in the fifth model on non-oil and gas export's role in supporting Indonesia's GDP growth found a substantial effect (R 0.932), higher than other variables' correlation in the current study and 86.89% contribution to the GDP growth. This finding aligns with the previous study on the relationship between exports and a country's GDP (Spahiu & Durguti, 2023). Another study also found that fuel price affected by the global crude oil price is directly proportional to GDP growth in developing countries (Abdelsalam, 2020), while growth promoted by fuel price affects GDP growth positively (Kliesen, 2006). Exports, particularly oil products, contributed significantly to Kuwait's GDP (Al-Zuhair & Al-Bazali, 2022), accounting for almost half of the variation in Oman's GDP (Al Jabri et al., 2022).

The last model examined the simultaneous effect of fuel price, exchange rate, interest rate, and export on a country's GDP and found simultaneous and significant effects of the variables. The combination of fuel price, exchange rate, interest rate, and export contributed to 97.7% of changes in Indonesia's GDP. The strong correlation among the variables shows that good supervision to achieve stable fuel prices, exchange rates, and interest rates to support international trade activities in non-oil and gas export will increase Indonesia's GDP with a 92.90% contribution. This contribution is significantly higher than focusing on boosting export alone, which only contributes 86.89% growth in GDP, supporting Spahiu and Durguti (2023), who found a significant relationship between export, interest rate, and GDP.

CONCLUSION

This study provides new information on the macroeconomic conditions affecting Indonesia's export and economic expansion amid global financial difficulties. The analysis found simultaneous effects of fuel price, exchange rate, interest rate, and non-oil and gas exports supporting Indonesia's GDP growth. Thus, this study examines the importance of fuel cost, exchange rate, and interest cost for the export-oriented industry. The finding emphasizes the need for a careful government initiative to support the business. Secondly, this study also underlies the importance of the exporting sector in boosting the economy by highlighting the importance of non-oil and gas exports on GDP growth.

Indonesia maintained and strengthened its position as an essential player in the global economy by ensuring stable fuel prices, exchange rates, interest rates, and government policies. This study's findings offer in-depth suggestions for businesses and politicians who want to develop export-oriented industries to support Indonesia's economic growth.

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"Demographic Winter": Does it Have an Impact on Indonesia? Population Economic Records

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Abstract

The originality of this paper focuses on existing material. It has implications for uncovering Indonesia's barriers to population growth, which are associated with economic components such as employment, wages, and happiness. On this basis, the orientation of this study is centered on cycles in the "demographic winter" of Indonesia. Short-term data for 2016–2021 is applied. This research is using multiple regression. In its actualization, population composition has a positive effect on the aging population, the aging population has a positive effect on the young workforce, and the young workforce affects wages. Another direct effect found a positive effect between fertility on marriage and birth productivity. From other moments, it is evident that being married positively affects birth productivity, and life expectancy and birth productivity positively affect happiness. In theoretical construction, the findings suggest further identification beyond the existing premise. The research in the next edition is growing by including other non-economic factors such as health, migration, mortality, and education.

Keywords:
prosperity; demographics; workforce; happiness

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INTRODUCTION

In 2030, demographic patterns will experience new colors that cannot be separated from academic discussions and debates. Worldometers (2023) and CEOWORLD magazine (2023) report that China has the highest population in the world in 2020. In fact, 1,439,323,776 people live in China. This number accounts for 18.47% of the global population. With the average growth of China's population of 1.003%, it is believed that it will continue to decrease. At the same moment, even though the population structure in India is still below that of China, where 1,380,004,385 people depend on the nation for their lives, the average growth of India's population (1.010%) far exceeds expectations or above is China's growth. This anomaly far exceeded expectations.

Moreover, India contributes to 17.7% of the world's population. Surprisingly, the two websites also inform that for 2030 and 2050, the global population's habitat will experience a spectacular transition. For illustration, India's population explosion in 2030 is 1,503,642,322 and in 2050 is 1,639,176,033, while the population change from China for the periods 2030 and 2050, is calculated to be 1,503,642,322 and 1,639,176,033. Automatically, the population volume in China is projected to continue to decline. In terms of quantity, the population in India is superior to that of China. Although contradictory, India's overpopulation can be harnessed to enter the competitive job market. Another reality is reflected by the birth rate of 2.2 babies per household in India, which also stands out from China, which is speculated to have a birth rate of 1.7 babies in 2022.

For the case of developing markets with middle to lower affluence, take the example of the top 10 world populations: Indonesia (1.01%), Pakistan (1.019%), Brazil (1.006%), Bangladesh (1.009%), and Mexico (1.01%), population growth has slowed down a bit. Only in Nigeria did growth experience a drastic increase of up to 1.025%. Interestingly, this is also followed by the United States (1.005%) and Russia (0.999%). In fact, as a country with a more advanced market share, the population growth of both countries has been detected to be declining.

Figure 1. Big 6 Population in Indonesia: 2016–2021, thousand

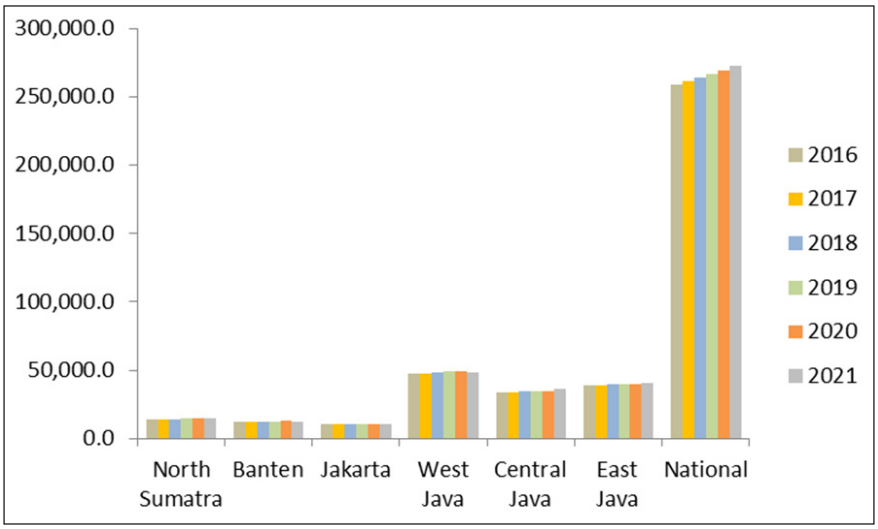

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Figure 1 reflects the top 6 areas/provinces with the highest population capacity in Indonesia, including North Sumatra, Banten, Jakarta, West Java, Central Java, and East Java (BPS-Statistics Indonesia, 2022). Throughout the past six years, the national population growth trend has been positive (1.07%). For domestic growth, the diagram above shows density, which is crucial. With an average population volume of 265,535.2 thousand, this has led to a slowdown in births and a shortage of labor resources. From year to year (y-o-y), especially from 2020 to 2021, the most striking performance is 1.11%. This condition was triggered by the transmission of the 2019 Coronavirus, which weakened human health, including the consequences of death (Fitriadi et al., 2022). Implicitly, the highest number and percentage of population referring to rankings are West Java: 48,522.5 thousand (18.28%), East Java: 39,738.4 (14.97%), Central Java: 34,749.1 thousand (13.09%), North Sumatra: 14,549.2 thousand (5.48%), Banten: 12,450.7 thousand (4.69%), and the Indonesian government center/Jakarta: 10,455.3 thousand (3.94%). Since the COVID-19 era ended and returned to normal, Banten's demographic has lost 833.8 thousand people or a reduction of 6.47% from 2020 to 2021. Related demographic turmoil in various parts of the world has caused uncertainty in the human ecosystem (Myers et al., 2013; Spernovasilis et al., 2021).

The emergence of a new issue called "demographic winter" is relevant to highlight. A decade ago, the world was distorted by "overpopulation" (Baus, 2017; Jiuhardi et al., 2022; Pimentel, 2012; Van Bavel, 2013). We are aware of the demographic explosion, which is feared to disrupt the food supply, and are faced with two options: death from hunger or death from satiety. Trimble (2013) defines gender sexuality in natural families as experiencing a depopulation crisis. Women's reproduction finds problems that can save generations in the urgency of individual marriage decisions and childbearing.

Furthermore, demographic winter is in contrast to the demographic trap, where, in general, the demographic trap is more towards developing nations with high birth rates, while demographic winter has entered developed countries such as in several European Unions, especially in Poland, Spain, Austria, Italy, and Germany (Dumont, 2019). This phenomenon was initiated by infrequently heard crying babies, shifts in culture and traditions, and the reduction of young workers. Instead, the demographic winter view of population conflict takes practical solutions that do not think about the future through arguments about giving birth and caring for babies, which will take time. In addition, productive workers must care for themselves, support their families, and adjust to the work environment. They assume that the high burden on the household and the increased cost of giving birth and education for caring for children can threaten their position or cause them to lose their jobs. Although the government currently distributes subsidies for childbirth, health, education, and other social security costs, most skilled workers there are more selective regarding marriage.

The literature that examines changes in human mobility in developing countries is discussed. Lawrence et al. (2013) argue that work professionalism enlivens economic cycles. As samples in Iran, Georgia, USA, Pakistan, and the National Longitudinal

Survey of the Labor Market Experience (NLSY) show, the dilemma is between choosing to postpone marriage to pursue a career, marry early, or commit to marrying someone who has the opportunity to have children (Gould, 2008; Ghazal et al., 2022; Lundberg et al., 2016; McClendon et al., 2014; Montazeri et al., 2016; Rukhadze, 2018). Normally, marital status is, in most cases, understood as the essence of forming a new generation. On the other hand, marriage motives are also dedicated to leading to happiness without the need to determine, program, and plan offspring. From a particular perspective, some set aside the marriage level for wasting time or just getting to know a partner without ties and deliberately not having children. In the pockets of the middle class, this concept is quite popular and is believed to exist amidst the tendency toward prosperity. However, demographic winter elsewhere can hinder household and household groups' respect, comfort, dignity, and continuity. As a comparison, if it is articulated in Indonesia, young talents whose marriages are late will be contrary to religion, considered selfish, and contrary to society's point of view. Although postponing marriage can improve education, business networks, relationship connections, and personal time flexibility in both the female and male genders, it is also detrimental to mental health at peak age and vulnerable to HIV transmission (Gündoğdu & Bulut, 2022).

Marriage or cohabitation is a holistic behavior that does not interfere with the rights of every human being. In other corridors, individuals are moving to demand autonomous freedom. Conversely, the more this is treated without synergistic participation, the more human adaptation can be eliminated. A universal reflection to stimulate population issues, especially avoiding a narrow mindset that threatens population extinction. Besides, nominal wages depend on the labor force, where worker productivity will determine the birth rate. With an optimal fertility rate, the life expectancy of the workers is also high. Logically, if population aging occurs, it will have implications for the fertility rate of workers of a certain age, so low birth productivity and life expectancy reduce happiness. Apart from per capita income, education, family harmony, assets and home environment, and security, the dimensions of human happiness that are also important are health, availability of free time, work, and social interaction. The four pillars are integrated with each other, relying on resource competence, peace of life, and conducive human relations.

In Cape Coast–Ghana, Amegayibor (2021) states that manufacturing companies' performance is determined by their employees' demographic factors, including educational level, age group, years of service, and experience. Trimble (2013) demonstrates that depopulation is a practical solution for "natural families" in European civilization networks. With a permanent social security system, new polemics are found, especially in fear of sexual, economic, racial, and moral chaos. Mino & Sasaki (2023) dissect the long-term consequences of population decline in Japan. With dwindling human resources, consumption and per capita income will eventually stop—also high-income countries, such as the USA. Jones (2022) illustrates a constant population, which is reflected in the fertility rate of women, which grows stagnant, so the standard of

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living is not allocated optimally; it can even disappear as the world population slows down. This reason underlies Mehrolhassani et al. (2019) criticism of Iran's decreasing rate of population growth. In the form of general fertility that has been disrupted since the last decade, Iran's population balance is classified as "small" as a result of modernization changes whose behavior does not match the gap between generations, including uneven urbanization, unemployment, and weak economic participation, the age of marriage, marital pressure, uncontrolled abortion, family formation, and perceptions of the value of life. Since the last century, the USA has experienced the sharpest decline in life expectancy (Tanne, 2023). Reversing the decline in life expectancy cannot be separated from strengthening health insights toward disease control (Lichtenberg, 2022). Heuveline (2022) considers the novel Coronavirus disease of 2019 as an unintended consequence of human civilization and adds a new death rate for middle- to upper-income earners.

In some cases, the discussion about anomalies in demography raises the concerns of many parties (Bradshaw & Brook, 2014; Sadigov, 2022). Initially, amid a period of war, the population was beset by the uncertainty of survival. The high death rate due to poverty, hunger, and inadequate access to health care has led to the exponential urbanization of an area. With the availability of transportation routes, water sources, soil fertility, a suitable climate, and topography with abundant nature, migrants can settle in new areas. Along with the shift to increasingly sophisticated times, a population explosion occurred—rapid growth with limited residential space causing an uneven population density. At the same time, many programs are designed to limit the birth rate. Besides that, lifestyle shifts have changed human character, including the age requirement for marriage. One factor determining economic welfare is the type of work. Not all jobs absorb labor or can provide sufficient wages. With high living needs, workers think twice about getting married. As a result, the productive age for building a household is missed. Some workers choose to develop their careers and spend time at work. Finally, the opportunity to have offspring was also ignored. The slowing global population cannot be separated from humanity, which depends on limited resources. Wasteful consumption (e.g., energy scale) by depleting nature triggers disparities in birth rates. Low-income countries have high birth rates at their peak, while low-income countries have low birth rates (Peek, 2022).

The novelty of this research lies in the theme raised around the systematic link between demographic aspects and economic prosperity. Also, this is different from similar publications, which have yet to talk much about developing markets, especially Indonesia. Speaking of "demographic winter," most academic debates only address developed countries experiencing a population crisis but not developing or underdeveloped countries. Uniquely, some skepticism about downsizing the population is seen as increasing productivity. However, this assumption is refuted in some cases because, over duration, it will lead to a decline in economic performance. Returning to the initial problem, Indonesia has broad market segmentation, economic potential, and workforce volume in preparation for facing broad industrial opportunities in the future. However, it is

experiencing a demographic trap that is not evenly distributed between regions. Often, Indonesia is under the radar or escapes the attention of scholars for in-depth observation. Observing this asynchronous cycle, where access to employment opportunities for the labor-intensive sector can inclusively create prosperity, the employment system, which is highly dependent on population movement, cannot be ignored. Based on the above compilation of paradigms and data, exploring the aspects that influence happiness makes sense. This scientific paper's idea related to population happiness contains demographic, social, employment, and economic elements. The paper's outline is organized into four phases: introduction, method, results and discussion, and conclusion. From a specific angle, some studies do not reveal non-economic aspects that can affect the demographic sphere. This research can be proposed based on different parameters than the others. By combining economic and non-economic aspects, we concentrate on Indonesia's potential demographic slowdown.

METHODS

The data focuses on secondary-type data facilitated by BPS-Statistics Indonesia. Economic and social data related to population are the main part. Data priority starts in 2016 an end in 2021. With a frequency of six periods and ten key variables, the observations are 60 samples. Objectivity at the domestic level (Indonesia). Data collected from annual documents is created using an econometric approach.

Variables are modified into two formats: dependent variables and independent variables. Variables consist of population composition (PC), aging population (AP), young workforce (YW), wages (Wgs), fertility (Fty), postponed marriage (PM), married (Mrd), birth productivity (BP), life expectancy (LE), and happiness (Hps). In the context of data, study variables have varied units. Population composition is based on ratio, while the aging population, young workforce, fertility, and birth productivity have the same criteria, i.e., people. Operationally, wages are adjusted to nominal IDR, married and postponed marriages are described by percentage, life expectancy is measured by years, and happiness is measured via index. In relation, only PC and HP act constantly. Definitively, PC functions as a "pure independent" that starts the initial hypothesis. Then, Hps is categorized as a "pure dependent" which is designed into the final model. From the relationship arrow, the use of PC is concerned with influencing the dependent variable, while Hps is addressed as the ultimate goal of being influenced by the independent variable. The other eight variables (AP, YW, Wgs, Fty, PM, Mrd, BP, and LE) are bidirectional, indicating that they are clustered into dependent and independent variables. In principle, Figure 2 represents the variable package.

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Figure 2. Conceptual Foundation

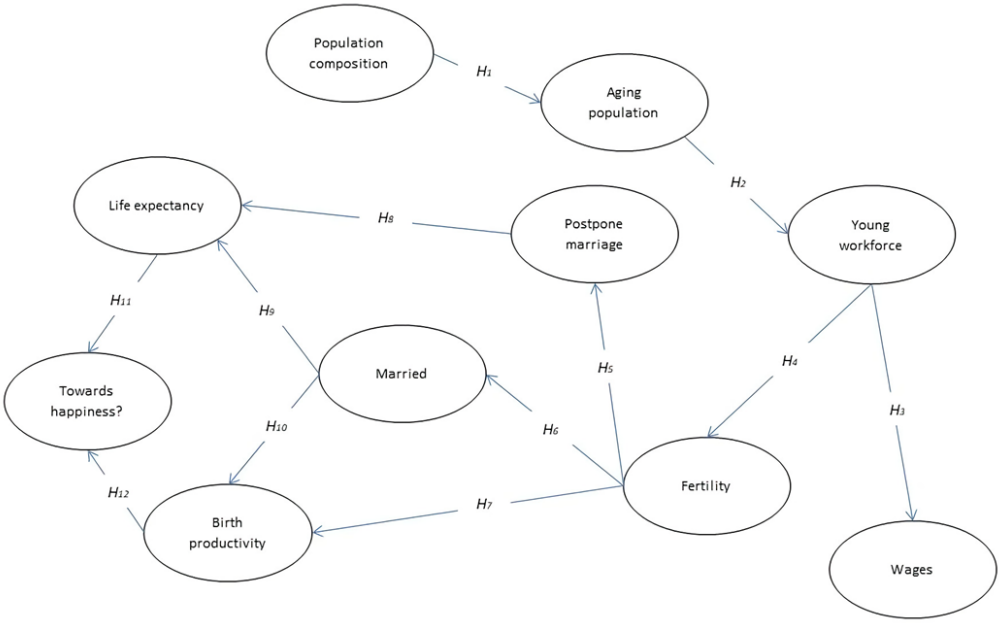

Table 1. Hypothesis Instruments and Assumptions

Codel/label of variables	Measurement	Scenario
PC	The sex ratio of the population between the male and female genders	
AP	The "generation X" pyramid/population hierarchy aged 45–75+	+/-
YW	Workers classified as "generation Y (millennial) and Gen. Z (i Generation)" aged 15–44	+/-
Wgs	Nominal average provincial minimum wage (UMP)	+/-
Fty	Fertility rate per woman	+/-
PM	Proportion of population with single status	+/-
Mrd	Proportion of population with married/living partner status	+/-
BP	Live birth per 1,000 population	+/-
LE	The life expectancy of the population	+/-
Hps	Population happiness index on a scale of 0–10	+/-

Each variable has different characteristics, so 12 hypotheses are formulated as above. Technically, only population composition is instructed as a pure independent variable and the other nine variables are converted into a unidirectional relationship. These dimensions include: aging population, young workforce, wages, fertility, postponed marriage, married, birth productivity, life expectancy, and happiness. The connotation of the cross-variables is summarized in Table 1.

After the data was processed, the material for analysis was set using multiple time-series regression. There are four systematics in regression: descriptive statistics, correlation (R), determination (R^2), and partial effects (t-statistics and probability). Descriptive statistics detect values at the mean–maximum–minimum–standard deviation (Std. Dev./

S.D), R^2 shows the direction or strength of the variable relationship, and a partial test confirm the partial association. The first, second, third, and fourth formulations are arranged below:

$$AP = \Delta\delta_1 + \beta_{PC} + \varepsilon_1 \quad (1)$$

$$YW = \Delta\delta_2 + \beta_{AP} + \varepsilon_2 \quad (2)$$

$$Wgs = \Delta\delta_3 + \beta_{YW} + \varepsilon_3 \quad (3)$$

$$Fty = \Delta\delta_4 + \beta_{YW} + \varepsilon_4 \quad (4)$$

In the fifth, sixth, and seventh formulations the following is written:

$$PM = \Delta\delta_5 + \beta_{Fty} + \varepsilon_5 \quad (5)$$

$$Mrd = \Delta\delta_6 + \beta_{Fty} + \varepsilon_6 \quad (6)$$

$$BP = \Delta\delta_7 + \beta_{Fty} + \varepsilon_7 \quad (7)$$

Then, the eighth and nine equations are developed as follows:

$$LE = \Delta\delta_8 + \beta_{PM} + \beta_{Mrd} + \varepsilon_8 \quad (8)$$

$$BP = \Delta\delta_9 + \beta_{Mrd} + \varepsilon_9 \quad (9)$$

For the tenth formula, the math function is:

$$Hps = \Delta\delta_{10} + \beta_{LE} + \beta_{BP} + \varepsilon_{10} \quad (10)$$

Symbol notation: $\Delta\delta$ is delta/scalar, β is the beta coefficient, and ε is residue.

RESULT AND DISCUSSIONS

Table 2 verifies the 4 points on various descriptive statistics (SD, mean, maximum, and minimum). In practice, the score obtained from 10 variables is broken down from the highest to the smallest. The first discusses SD, the largest score for the AP variable (*S.D = 4,013,364.58*) and the lowest for the Hps variable (*S.D = 0.09*). Both tell the mean, with the largest score for the YW variable (*mean = 80,011,461.33*) and the lowest on the Fty variable (*mean = 2.24*). The third studied the maximum, with the highest score for the YW variable (*max. = 81,589,206*) and the lowest for the Fty variable (*max. = 2.31*). The four display the minimum, the greatest score for the YW variable (*min. = 77,048,727*) and the lowest for the Fty variable (*min. = 2.19*). Descriptive statistics aim to describe the features of a particular data set by providing a brief summary of the data and sample size.

Furthermore, the correlation coefficient tests the closeness of the relationship between two or more variables, which is interpreted with the R value. In the SPSS output, a correlation matrix is applied (see Table 3). In practice, the performance of variables that rely on a significance degree of 99% (p *<0.01*) proves that if there is a reciprocal probability of AP with WGs and LE (p *= 0.000*), YW with Fty (p *= 0.003*) and BP (p *= 0.005*), Wgs with LE (p *= 0.000*), Fty with BP (p *= 0.001*), and PM with Mrd (p *= 0.000*). Among these linkages, the most impressive is the variable PM to Mrd

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and vice versa. Correlation performance between variables through a significance scheme of 95% (p *<0.05*) indicates that there is a collective association of AP with PM (p = *0.019*) and Mrd (p = *0.018*), Wgs with PM (p = *0.018*) and Mrd (p = *0.017*), as well as PM and Mrd to LE (p = *0.025*; p = *0.023*). The most progressive 5% correlation finding is Wgs the Mrd and vice versa.

Table 2. Result of Descriptive Statistics

Items	Std. Dev.	Mean	Maximum	Minimum
PC	.65	101.5	102.3	100.9
AP	4,013,364.58	70,656,983.33	76,198,300	65,659,400
YW	1,814,342.37	80,011,461.33	81,589,206	77,048,727
Wgs	2,828,860.41	2,370,884.17	2,687,724	1,997,819
Fty	.41	2.24	2.31	2.19
PM	2.72	34.94	37.85	32.2
Mrd	2.72	65.06	67.8	62.15
BP	.46	17.27	18	16.7
LE	.25	71.26	71.57	70.9
Hps	.09	5.24	5.35	5.09
Sample	60	60	60	60

Multiple regression displays the unidirectional strength of determination and the significance of all relationships through a probability degree of 5% (p *<0.05*). R squared (R^2) or the coefficient of determination, represents a statistical parameter that measures the difference in one variable and is adjusted in the second variable when calculating an investigation. The most prime or nearly perfect determination model is fertility and married to birth productivity (R^2 = *99.8%*). Only 0.2% was a confounding factor outside the regression. On the one hand, the weakest determinant model is the link between life expectancy and productivity on happiness (R^2 = 13.6%), where 86.4% is an off-track confounding factor. The regression results stated that sub-1: PC to AP (t = 3.788; β = 0.700), sub-2: AP to YW (t = 4.699; β = 0.543), sub-3: YW to Wgs (t = 1.640; β = 0.634), sub–4: YW to Fty (t = -6.734; β = -0.959), sub–5: Fty to PM (t = 3.034; β = -0.488), sub–6: Fty to Mrd (t = 1.116; β = 0.487), sub–7: Fty and Mrd to BP (t = 21.056; β = 0.875 and t = 5.180; β = 0.215), sub–8: PM and Mrd to LE (t = -2.139; β = -1.461 and t = -2.382; β = -2.796), and sub-9: LE and BP to Hps (t = 0.170; β = 0.151 and t = 0.237; β = 0.211).

Figure 3 displays that PC has a positive impact on AP, and AP also has a positive impact on YW. Then, YW has a positive impact on Wgs, but YW has a negative impact on Fty. The Fty variable has a negative impact on PM but a positive impact on Mrd and BP. PM and Mrd have a negative impact on LE, and Mrd has a positive impact on BP. The empirical output also shows a positive relationship between LE and BP on Hps. In other words, hypotheses 1, 2, 3, 6, 7, 10, 11, and 12 are accepted. Meanwhile, 4, 5, 8, and 9 were rejected. From the existing findings, the population composition is driving the aging population by 70%. The improving aging population increases 54.3% of

the young workforce. Followed by an increase in the young workforce, it also stimulated wages to reach 63.4%, but not fertility, which decreased to 95.9%. Fertility, which is not ideal, actually reduces the postponed marriage by 48.8%. However, good fertility can increase marriage (48.7%) and birth productivity (87.5%). The impact of postponing marriage and being married, which were unstable for several periods, actually reduced life expectancy by 146.1% and 279.6%, respectively. The good news is that when married, it grows positively and can increase birth productivity by 21.5%. With life expectancy and birth productivity that exceed expectations, consistently towards integrated happiness of 15.1% and 21.1%.

Table 3. Result of Correlation Estimation

Items	PC	AP	YW	Wgs	Fty	PM	Mrd	BP	LE	Hps
PC	1	.700 (.121)	.110 (.836)	.717 (.109)	-.310 (.549)	.586 (.222)	-.590 (.218)	-.360 (.484)	.698 (.123)	.525 (.285)
AP	.700 (.121)	1	.543 (.265)	.983** (.000)	-.588 (.220)	.885* (.019)	-.890* (.018)	-.706 (.117)	.995** (.000)	.009 (.986)
YW	.110 (.836)	.543 (.265)	1	.634 (.176)	-.959** (.003)	.403 (.429)	-.404 (.427)	-.942** (.005)	.613 (.196)	-.389 (.446)
Wgs	.717 (.109)	.983** (.000)	.634 (.176)	1	-.705 (.117)	.887* (.018)	-.891* (.017)	-.805 (.054)	.993** (.000)	.072 (.892)
Fty	-.310 (.549)	-.588 (.220)	-.959** (.003)	-.705 (.117)	1	-.488 (.326)	.487 (.327)	.980** (.001)	-.659 (.155)	.121 (.820)
PM	.586 (.222)	.885* (.019)	.403 (.429)	.887* (.018)	-.488 (.326)	1	1.000** (.000)	-.642 (.169)	.868* (.025)	.280 (.591)
Mrd	-.590 (.218)	-.890* (.018)	-.404 (.427)	-.891* (.017)	.487 (.327)	1.000** (.000)	1	.642 (.169)	-.873* (.023)	-.273 (.600)
BP	-.360 (.484)	-.706 (.117)	-.942** (.005)	-.805 (.054)	.980** (.001)	-.642 (.169)	.642 (.169)	1	-.764 (.077)	.095 (.857)
LE	.698 (.123)	.995** (.000)	.613 (.196)	.993** (.000)	.659 (.155)	.868* (.025)	-.873* (.023)	-.764 (.077)	1	-.010 (.985)
Hps	.525 (.285)	.009 (.986)	-.389 (.446)	.072 (.892)	.121 (.155)	.280 (.591)	-.273 (.600)	.095 (.857)	-.010 (.985)	1
Sample	60	60	60	60	60	60	60	60	60	60

Note: **) 1% probability, *) 5% probability.

Nowadays, some literature links sustainable development to determining human quality (Dewanty & Isbanah, 2018; Harris & McDade, 2018; Huggins et al., 2018; Osher et al., 2020; Ristea, 2013; Short & Mollborn, 2015). In macroeconomic literacy, a lifestyle transition enables and drives personal behavior to choose whether the individual is active as a subject that encourages better welfare improvements or becomes an object. Economic pressures, family demands, workloads, and widening social inequality will trigger discriminatory actions in everyday life. Substantively, the root of the challenge so far is that labor productivity is only measured by career brilliance without considering other factors. In this era of disruption, handling in the formation of productive humans is considered adaptive. This condition starts with cross-professions in several commodities

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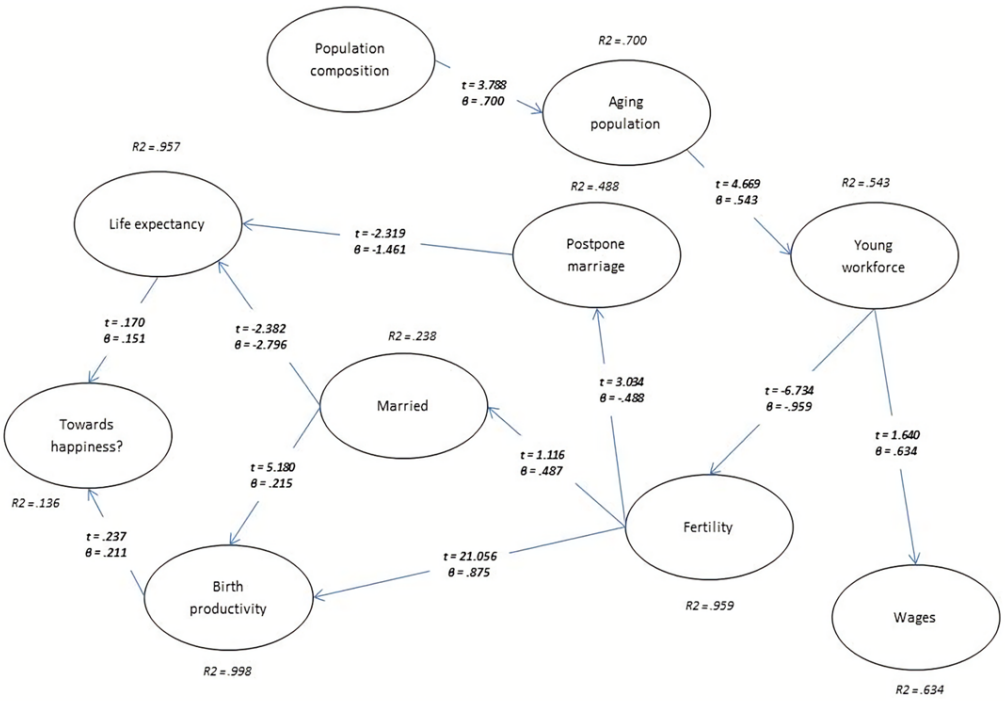
(e.g., administration, bureaucracy, and other service areas in offices), providing employees opportunities to develop creativity, work from home with technological devices, and learn about a more comprehensive network. In a more proportional mechanism, as long as this does not conflict with privacy and household matters, the organization will not be harmed.

Mao & Zhou (1988), Olshansky (1997), and Wang et al. (2022) commented that the age structure of the population is not only influenced by marriage, immigration, death, and birth but also changes from a micro perspective, such as family factors. The older the age structure, the smaller the family size, and vice versa. There is a significant imbalance between urban and rural populations. It is characterized as the nuclear family caused by the convergence of industrialization in increasing economic development, thus causing an aging population. Internal age also influences family structure and size. For example, in Beijing, China, the adult population is more dominantly influenced by economic-social measures, marriage, and birth. So, the younger residents still live with their parents. Families formed at that age positively affect fertility, and those getting older face loneliness. In China, those turning independent are not a burden on the family, but an aging society is putting economic pressure on the contemporary term. In particular, the evolution of population aging affects spatial design. The Chinese population in the western and central regions is relatively small compared to those on the east coast. There is a severe polarization in the aging population and the resulting inequality in competitiveness. Trends in population aging are also influenced by and affect the social and physical environment in which they live.

Figure 3. Evaluation on Regression



This scientific work highlights the effect of the aging population on the young workforce. Comparatively, in the United States, Korea, Taiwan, and the European Union, it is detected that the older generation spends more time at work than their younger counterparts (Barakovic Husic et al., 2020; Huang et al., 2019; Lee et al., 2021; White et al., 2018). This fact also occurs worldwide, and its consequences are related to the workforce's widespread prevalence and aging demographics. Older workers tend to delay retirement and extend work contracts to secure financial stability. This disparity raises concerns that an increase in the employment of older people in the labor market will lead to unemployment for young people. Based on the gender of various occupations, educational certificates, and industries, older female workers complement the younger female workers, but older workers exclude the younger workers. This condition has become an international concern, as the elderly are expected to become an increasingly aging population, affecting work productivity. The accumulation of active worker resources and aging trends urge the workplace to balance personal life and job retention.

Reviews of the young workforce on wage rates are discussed by members of the European Union, the United States, and Japan (Eichhorst et al., 2014; Kondo, 2016; Ouimet & Zarutskie, 2014). In large-scale companies, on average, they choose young employees to be paid less, but young employees who work in small companies are actually paid higher wages. The consideration is that they show a much greater passion for work, innovation, and skill for the company's survival. Work professionalism does not emphasize the employment situation of older workers with those who are young, but it can encourage the mobility of ideas, provide added value, and exchange experiences. Since the "baby boomers" reached the most remarkable working age, some places have reduced the number of part-time workers and cut the wages of older workers.

The cause of fertility also depends on the activities of young workers in the workplace. In the long term, the repercussions can affect the decision to marry or delay marriage. A high fertility rate is one of the alternatives to increasing birth productivity. In Sweden, England, Ukraine, Switzerland, Spain, Slovenia, Slovakia, Portugal, Poland, Norway, Netherlands, Ireland, Hungary, Greece, Germany, France, Finland, Estonia, Denmark, Czech Republic, Belgium, and Austria, life plans are confronted by birth delays. Interactivity between partners with increasing age has an essential effect on the success of conception. Working for a long time can ensure reproductive success. However, job uncertainty also channels fertility intentions. When welfare is low, the level of life satisfaction is under pressure. The certainty of individual work provides a situation of measurable welfare, prestige, life balance, and fertility. Subjectively, younger individuals with insecure occupations have consequences for household affluence but help fertility preferences. This fact aligns with the paper highlighted by Delbaere et al. (2020) and Vignoli et al. (2020).

What is experienced in many countries is also seen in Indonesia. Whether it is married or unmarried, status can reduce life expectancy. Various cases in Denmark, Switzerland, and the United States were exposed. Compton & Pollak (2021), Drefahl (2012), Felder (2006), Jia & Lubetkin (2020), and Kaplan & Kronick (2006) evaluated that when people live with a partner with a legal or not-married status, it does not necessarily represent social reality. Early death was found to be highest for people living together without marriage

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and followed by those who are married. Life span in young and older couples provides a complex analogy for survival that combines behavior during marriage with education, trust, age, and ethnicity. Dramatically, the gap between couples and singles is leading to longevity in gender. The smallness or longevity of the spouses is elaborated by altruism, wealth, and utilitarianism. The mortality rate of people living with their partners and who are married is positively higher than that of those who have never been married. The relationship between life expectancy and marital status and vice versa involves assumptions that limit the basic activities of older people compared to younger people.

The fundamental difference lies only in binding regulations. If a couple wants to have children, they are required to marry formally. Whether the regeneration will be a biological child or an adopted child is another matter in the future. There must be a legal bond that does not recognize "married by accident" and does not understand living together without being married. That way, the obligation to marry for couples is free from religious orders that have been believed from generation to generation.

In contrast to Indonesia, in the United States, delaying marriage for women and men does not significantly impact births, except for cases of early marriage (Loughran & Zissimopoulos, 2009). Differences in specialization of marital status comprehensively determine birth rates (Killewald & Gough, 2013). Foreman-Peck (2011) explains that the household economy contributes to the fertility quality of Western Europeans. According to Parsons et al. (2015), marriage at a certain age with a low level of thinking maturity and education also contributes to the risk of early death, poverty, malnutrition, loss of income, and weak control over child growth. Changing decisions in domestic marriages can endanger births, make it more difficult for children's health, and complicate parenting and child education.

Lastly, the connection between life expectancy and birth productivity on happiness exists. Research from Chirinda & Phaswana-Mafuya (2019), Gimenez et al. (2021), Heydari (2017), Lawrence et al. (2015), and Lozano & Solé-Auró (2021) reveals that life expectancy positively drives happiness in South Africa, Mazandaran–Iran, Chilean senior citizens, United States adults, and working-age Europeans. Inferentially, the happiness of the population in several developed countries, such as the Organisation for Economic Co-operation and Development (OECD), is also determined by the consistency of the birth rate (Bellet et al., 2019; García-Buades et al., 2019; Glass et al., 2016; Isham et al., 2021; Lyubomirsky et al., 2005; Oswald et al., 2015; Robertson & Cooper, 2011; Sonfield et al., 2013). Recognizing Indonesia's "demographic bonus" with its multicultural traditions sparked concerns about social disparities at the regional level. Exploring this dynamic, layers of the population are also related to employment affairs, female fertility rates, and life expectancy. From a more reasonable viewpoint, Cheung & Leung (2011) and Leyk (2019) claim that heterogeneous urban communities tend to differ from rural communities, where the majority are homogeneous. Following up on the negative response between the young workforce towards fertility, then fertility on postpone marriage, and married and postpone marriage towards life expectancy, implying a signal regarding weak population policy governance. This study is by previous predictions that analyze the two-way relationship between young workers, fertility, the decision to marry, and life

expectancy (Ahn et al., 2021; Chari et al., 2017; Ng & Wang, 2020; Shreffler & Johnson, 2013; Yang et al., 2022). From existing papers, the underlying cause of the four discussions is inequality in work-life balance (WLB). For the sake of prospects for prosperity, career women in the USA who help the family economy often postpone births so that fertility intentions are moderated by the high intensity of working hours. Among Korean women, long working hours have an impact on infertility. The risk of infertility is adjusted for a subgroup of young workers with irrational work schedules. In parallel, the universal marriage norm for Chinese women is being transformed from a high fertility contribution to a low fertility one. Since the 1980s, delays in marriage have been significantly correlated with reduced fertility rates. Today, like men, women in Taiwan and South Korea prefer careers and are committed to work, so they delay marrying and raising children. Child welfare in India has been shown to be affected by health and education allocations, including the mechanism for determining the age of marriage.

CONCLUSION

The condition that is currently viral is "demographic winter." At the same time, the population's happiness is confronted with polemics that are not only related to demographics but also related to many economic and social elements. This scientific work aims to assess the effect of "demographic winter." Indonesia was chosen as a study. In the last six periods, positive causality has occurred from population composition to aging population, aging population to young workforce, young workforce to wages, fertility to married and birth productivity, married to birth productivity, and life expectancy and birth productivity to happiness. Additionally, negative causality is also seen between the young workforce on fertility, fertility on postponed marriage, then marriage, and postponed marriage on life expectancy.

This paper notes the abnormal situation in demographic development in Indonesia, with the leading cause being population aging. There is an inverted population age hierarchy where the older population outnumbers the young population, affecting the workforce. Young workers tend to be more selective about their work type. As a result, many of them are not absorbed into several jobs. In addition, the high pressure of life encourages the existing workforce to prioritize busy work. Another justification explains that productive workers with low fertility rates tend to choose to delay marriage. Apart from that, both the decision to marry and postpone marriage also reduce life expectancy. The findings recommend regulations related to health and education allocation. Under a more detailed lens, proposals for an integrated labor policy revitalization can be temporarily simulated.

All human existence is inseparable from demographic phenomena. Substantially, obedience to work has taken root, become civilized, and is a culture that cannot be separated. For this reason, the policy authorities need to inspect, protect, and execute technocratic steps to manage public population services. This policy includes institutional strengthening, such as partnering with associations and communities to popularize sustainable family planning programs. Practical policies must lead to precise strategies to solve population stratification, especially aging generations. Naturally, the fertility and birth productivity level is still controversial in Indonesia, requiring government intervention.

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Thus, stakeholders also educate and bridge the role of regulators in solving this problem. It is not the end of the world to design ever-increasing human development projects. This paper also inspires changes in people's lifestyles that are increasingly modern in adjusting demographic mindsets, behavior in choosing a life partner, work commitments, insight into birth, and knowledge about happiness. Academic implications for future research directions may consider other indicators of the "demographic winter."

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The Impact of Banking Competition on Bank Financial Stability: Evidence from ASEAN 5 Countries

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Abstract
In the era of the global economy, increasing banking competition will encourage an increase in banking transactions and activities. Banking transactions and activities will affect a country's financial stability. The purpose is to obtain the nonlinear effect of banking competition on financial stability at a specific regime. Previous research assumed that this impact applies to every economic regime. The impact of banking competition on financial stability can change at certain regime levels. Nonlinear impact occurs according to the regime. The method is based on a nonlinear threshold regression model. The researchers obtained the data from five ASEAN countries. The findings of this research are in-depth information about the financial system stability model. Analysis of the effect of variance supports the inconsistency of the effects found by several previous researchers. Practical implications are aimed at policymakers to make different decisions at the GDP level, CAR, and Liquidity. The economic regime in each country is different, so this analysis is constructive for policymakers to see the conditions of banking competition and financial system stability at a certain regime level. The originality article systematically offers an analysis that assumes the effect can change at a certain regime level.

Keywords:
banking competition; financial stability; distance to default; threshold regression

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INTRODUCTION

Southeast Asia countries have implemented the ASEAN Economic Community (AEC), which generally encourages competition to promote fair economic development. After the financial crisis, we found that the banking industry in five Southeast Asian Countries increased the number of loans and loan margins and decreased the number of deposits. Because competition in banking can cause different impacts on the loan and deposit market, it is interesting to study this period of economic expansion (Lee & Fukunaga, 2014). The banking industry in Southeast Asian countries has undergone significant changes since the Asian financial crisis occurred in the year 1997, caused by the credit bubble decline of the Thai baht. This condition was followed by the global financial crisis in 2008, started by Mortgage loan bubbles in the United States. Chen & Du (2016) and Kasman & Kasman (2015) discovered that, even after these crisis conditions, the banking industry in Southeast Asia is still prone to moral hazard; the Asian banking industry is experiencing high market power and better capitalization but high capitalization has not solved the moral hazard problem in less competitive markets.

Competition is often viewed as a positive force, but on the other hand, competition can decrease Charter value as the primary source of bank profit (Kabir & Worthington, 2017). Higher market power can increase the credit risk of borrowers as higher interest rates are charged on commercial loans, known as moral hazard issues, as shown by the Lerner index for the loan (Castro, 2013; Chaibi & Ftiti, 2015; Kasman & Kasman, 2015). They argue that the Lerner index for the deposit and loan markets describes different characteristics that must be calculated separately.

Banks with high market power could cause a higher degree of instability among large banks, thus making more ambiguous linkages between competition in banking and financial stability (Yusgiantoro et al., 2019b). Wang (2018) found that competition can diminish the franchise value of a bank, and the result can force banks to pursue riskier loan projects to maintain former banking profits. The Distance to Default provides a forecast for the probability of default of the market value of assets (Anginer et al., 2014). Market power is related to greater systemic fragility. It suggests the importance of guaranteeing a competitive market condition in banking, supporting the competition stability perspective. However, the weakness of this method is that the Distance to Default method needs to consider banking solvency risk from income volatility in banking operations (Castro, 2013).

A competitive market structure has various implications for economic policy; the degree of competition can become imperative for the efficiency of production, increasing demand for products and improving them, fostering the quality of products, improving productivity growth, and generating innovation in many industries (Anginer et al., 2014), however, in the banking industry. Beck et al. (2013) found that the impact of competition was more unclear in theory, and banking competition had good and bad effects on financial stability. The quality of financial products is determined by moral hazards and the degree of competition, which is related to the degree of innovation because banks that compete tend to do a lot of innovation and customer acquisition,

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which may harm financial stability, as competition causes banks to increase their credit and loan allocation and is associated with fragility (Barbosa et al., 2015; Braun et al., 2019; Chaibi & Ftiti, 2015; Ekananda, 2019).

In most industries, competition is considered a positive force Barbosa et al. (2015), but in the banking industry, competition is detrimental to financial stability (Dwumfour, 2017). Banking struggle has good and bad effects on financial stability. The Competition Fragility hypothesis suggests that banking system competition makes the financial system vulnerable to shock (Beck et al., 2013; Kabir & Worthington, 2017; Quijano, 2013). Increased competition could lead to increased lending rates, insolvency risk, and reduced banks' market power. It can be dangerous because competing banks are more willing to increase risk-taking with credit allocation. The Competition Stability hypotheses were studied by (Anginer et al., 2014; Arping, 2019; Diallo, 2015; Dwumfour, 2017; Fu et al., 2014; Kabir & Worthington, 2017; Lu et al., 2022; Mateev et al., 2022). They propose that banking competition can improve financial stability, resulting in higher asset quality, efficiency in banking operations, and reduced likelihood of a crisis. Moreover, the higher competition encourages banks to impose risk-taking incentives, making the banking system more supple to shock.

Finding suitable methods to explain the impact of banking competition on financial stability is essential. We use threshold regression to detail its impact by dividing data by threshold value and analyzing the consistency between Distance to default (DtoD) and Z-score as a proxy for financial stabilities. There are two hypotheses in the literature on competition among financial institutions, explicitly of competition stability and fragility. The competition stability hypothesis studied by several researchers is that banking competition can improve financial stability, as higher competition promotes banks to increase their prudential risk-taking incentives. This condition can result in higher asset quality, increased efficiency in banking operations, and reduced likelihood of a crisis, as well as making the banking system more resistant to shocks (Anginer et al., 2014; Arping, 2019; Diallo, 2015; Dwumfour, 2017; Fu et al., 2014; Kabir & Worthington, 2017; Lu et al., 2022; Mateev et al., 2022).

Two methods can measure competition. The first approach uses the structural method (market concentration) and the structure conduct performance (SCP) versus the efficient structure hypothesis. The following approach included the H-statistic developed by Panzar and Rosse (1987). The Lerner index of market power is known as the new economics of empirical industrial organization (Han et al., 2017).

In the banking industry, there are many ways to measure financial stability. The macro-financial risk can be used for evaluating the risk of banks and financial institutions at different aggregations (Anginer et al., 2014). The famous method is Merton Distance to Default. It measures the Distance between the market value of an asset and the barrier of default. This method indicates the number of standard deviations away from the default obstacle to the market value of assets, and it can be extended into probabilities of default if the circulation of assets is known (Kliestik et al., 2015).

From the competition-fragility perspective, in recent literature, Diallo (2015) has cast off the Z-score to show the positive connection between competition and financial fragility and support the hypothesis. For the Asian banking industry, Souza (2016) used the Z-score to capture bank income volatility, capitalization in banking, and bank insolvency risk to evaluate financial stability. The empirical results indicated that high market power is related to superior capital adequacy. The Lerner index that is more suitable for banking competition is the Monti-Klein model, which separates the Lerner index of market power for loans and deposits as proposed by Van den End (2016). Monti and Klein's model examined banking activities related to collecting deposits and providing customer loan services.

The novelty of this study is as follows. The study divides stability measures according to the Distance to Default from a bank's market value and Z-score measures. Moreover, the size of the competition follows competition in banking, namely from deposit funding and credit development. The study compared two measures of financial stability to determine the difference between the Distance to Default Risk measure of a bank's market value and the Z-score measure of volatility risk income. The study used the Lerner Index for the deposit (LernerD) and lending (LernerL) markets, a more suitable method for measuring banking industry competition. Another novelty is that this research applies threshold regression to obtain analysis results for different economic regimes. The advantage of this method is that researchers obtain a threshold value that is useful for optimally dividing economic conditions into several regimes.

Our research gap is explained as follows. This study examines the relationship between bank competition and financial stability, asking whether competition is feasible or insufficient for financial stability by measuring competition. In the linear model, the estimated effect is the effect that applies to all regimes, data, and situations. This study applies the threshold regression method to look for the non-linear effect of independent variables on financial stability in various economic regimes (Asare et al., 2021).

The contribution of the paper can be explained as follows. This research requires measurement of competition that can consider the competition on banking loans and deposits. We consider the Lerner Monti-Klein index model, which separates the Lerner indices for the loan market and deposit market as proposed by (Bikker et al., 2012). This research applies a non-linear model compared to a linear model, resulting in a broader analysis where the threshold regression model produces a specific effect on a particular regime. Threshold regression can choose a threshold value to separate two or three regimes.

This paper aims to provide future predictions about the banking industry competition for various banking economic and financial regimes. Using this specification can show banking operations that generate income from interest on loans and maintenance costs from interest on deposits. This specification also examines the behavior of monopolistic banks challenged by an elastic demand curve for loans and the supply of deposits (Khan et al., 2018; Kusi et al., 2020). This research aims to open insights into analysis that has assumed a fixed effect in all economic conditions. The effect of each determinant

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of financial stability is different for various regimes. We apply threshold regression to obtain a non-linear erection at the appropriate regime.

METHODS

The samples consist of two large, two medium, and two small banks from the five Southeast Asian countries. The banks' ratings were identified from institution rankings for each country from Orbis Bank Focus database, World Bank, and financial statements from the monetary authority in each country for 2012–2021. We employ this sample following Montes and Carlos (2015) and Ye et al. (2012), in which they use Spanish bank data that can reflect competition between large, medium, and small-sized banks. The result is not robust instead, it is consistent with the expected significant result from panel data.

Using the panel data approach, we can examine the connection between bank competition, capital adequacy and GDP to the systemic risk Distance to Default in the banking industry in five Southeast Asian countries (Model I). We employ this approach because there are numerous advantages to using this econometric specification. First, there is the ability to concede time variation and cross-sectional discrepancy in our model. Second, this method permits us to avoid several biases among cross-country regressions. Third, there is the likelihood that using influential variables will reduce bias, such as in the model by Fu et al. (2014).

$$DtoD_{it} = \alpha + \beta_2 LernerL_{it} + \beta_3 LernerD_{it} + \beta_4 gGDP_{it} + \beta_5 CAR_{it} + \beta_6 Liq_{it} + \varepsilon_{it} \quad (1)$$

In theory, we expect $\beta_2 < 0, \beta_3 > 0, \beta_4 < 0, \beta_5 < 0$ *and* $\beta_6 < 0$. The empirical model that examines the connection between bank competition, capital adequacy and GDP to the financial stability of the Z-score in the banking industry is as follows (Model II):

$$ZCO_{it} = \alpha + \delta_2 LernerL_{it} + \delta_5 LernerD_{it} + \delta_3 gGDP_{it} + \delta_4 CAR_{it} + \delta_6 Liq_{it} + \mu_{it} \quad (2)$$

where the independent variable includes the market power for loans (LernerL) and market power for deposits (LernerD), macroeconomic variable GDP growth to account for country revenue, capital adequacy ratio as variable to control the degree of competition, Liquidity as variable that reflects operational risk, and the error term. In theory, we expect $\delta_2 > 0, \delta_3 < 0, \delta_4 > 0, \delta_5 > 0$ *and* $\delta_6 < 0$. Model I was developed to the Threshold Regression Panel Data, where gGDP is specific for each regime while the bank variables are the same. This model applies gGDP as a threshold (Model III)).

$$\begin{aligned} DtoD_{it} = {} & (\tau_i + \tau_2 LernerL_{it} + \tau_3 LernerD_{it} + \tau_4 gGDP_{it} + \tau_5 CAR_{it} + \\ & \tau_6 Liq_{it}) \mathbb{I}\left(gGDP_{it} \leq \tilde{k}\right) + (\lambda_i + \lambda_2 LernerL_{it} + \lambda_3 LernerD_{it} + \\ & \lambda_4 gGDP_{it} + \lambda_5 CAR_{it} + \lambda_6 Liq_{it}) \mathbb{I}\left(gGDP_{it} > \tilde{k}\right) + \varepsilon_{3it} \end{aligned} \quad (3)$$

The specific impact of gGDP is expected to be positive for all levels of gGDP. Model IV was developed with the Threshold Regression Panel, where gGDP is specific for each regime during the same bank variables and the same dummy bank for each regime. This model determines gGDP as the threshold (Model IV).

$$ZCO_{it} = (\omega_i + \omega_2 LernerL_{it} + \omega_3 LernerD_{it} + \omega_4 gGDP_{it} + \omega_5 CAR_{it} + \omega_6 Liq_{it})\mathbb{I}(gGDP_{it} \leq \tilde{k}) + (\gamma_i + \gamma_2 LernerL_{it} + \gamma_3 LernerD_{it} + \gamma_4 gGDP_{it} + \gamma_5 CAR_{it} + \gamma_6 Liq_{it})\mathbb{I}(gGDP_{it} > \tilde{k}) + \varepsilon_{4it} \quad (4)$$

This study applies threshold regression because of the assumption that the effect of the variables is not linear at the level of GDP, CAR and Liquidity (Model III and Model IV). Threshold regression is as follows. Parameters γ_j and βj are estimated according to the same least squares procedure used for the standard STAR or SETAR. The operationalization of the dependent variable is as follows. We follow the Merton Distance to Default model based on Castro (2013) and Anginer et al. (2014). Default occurs when the company asset values fall below the default point (d*).

$$d^* = short\ term\ debt + \frac{1}{2}\ x\ long\ term\ debt \quad (5)$$

We use Distance to Default follow Black–Scholes (BSM) option pricing model (Kliestik et al., 2015).

$$Distance\ to\ Default\ (DtoD) = \frac{E(F(t)) - d*}{\sigma_F} \quad (6)$$

Where: E is the Equity, F(t) is the current market value of the company asset, d* is the value of debt also called default point, σ_F is the annualized market value of the company asset with calculation (market value of asset x volatility of market value asset) , T is the time until debt matures. A higher distance to default implies higher financial stability in the distance between market value of banks to the default risk (Kliestik et al., 2015).

Second measurement by Z-score natural logarithm method. This measurement is based on Return on Average Assets (ROAA), which can capture bank income volatility, capitalization and insolvency risk (Anginer et al., 2014).

$$ZCO_{it} = \frac{ROAA_{i,t} + EQTA_{i,t}}{SDROAA_{i,t}}, \quad (7)$$

Where ROAA is the return on average assets, SDROAA is the standard deviation of the bank return on average assets, and EQTA is the total equity to total asset ratio originally used as a measure of bank leverage. High volatility predicts uncertainty in banking operation can reflect that bank is on the brink of bankruptcy, while low volatility reflects bank economic condition is steadier. A higher ZROAA implies lower financial stability.

In the introduction, there is a debate about the existence of diverse, inconsistent, insignificant, and variable effects (Kusi et al., 2020). The varying effects are caused because the estimated data consist of various regimes with particular economic behavior (Anginer et al., 2014). The effect is insignificant because in linear regression, the effect is the average of all the times and countries involved. Variable effects due to changes in periods and units of analysis are not robust, caused by outliers at various positions. To start the analysis using nonlinear methods, we must ensure the presence

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of linearity in the model. Following the background and literature, we state the hypothesis as follows:

H1 : There are non-linearity influences of banking competition on financial stability

Under the purpose of the study, we use deposit funding and credit development as the real banking competition. The study used the Lerner Index for the deposit (LernerD) and loan (LernerL) markets. Second, banking competition affects the Distance to Default risk measure of the bank's market value and the Z-score measure. Theoretically, both Lerner indices affect financial stability in linear models and threshold regression. This study expects that analysis with threshold regression displays the same and more profound results than linear regression. Hypotheses are proposed in research to prove the compatibility between theory and empirical studies. The hypothesis is given as follows.

H2 : The increase in banking competition of deposits influences the decrease in financial stability.

H3 : The increase in banking competition for loan influence the increase in financial stability

H4 : The increase in economic growth influences the decrease in financial stability.

The discussion of the research results starts with an explanation of the data description and continues with data testing and model selection. The steps for model selection are presented as follows—first, the panel data co-integration test, second, Wald test to choose an individual effect, third, linearly test, robust test and model evaluation for hypothesis Statistical hypotheses to answer the research hypothesis are as follows. Proof of the hypothesis by testing the t statistic as follows. We prove the H2 where the financial stability is the DtoD by testing the significance of β_2, τ_2 or λ_2. We prove the H1 where the financial stability is the ZCO by testing the significance of δ_2, ω_2 or γ_2. In the same way, we do on the H3 and H4.

RESULT AND DISCUSSION

Next, we examine the relationship between our model for the five Southeast Asian countries' banking industries. Table 1 shows the Distance to Default calculation for six banks in each country. We calculate the weighted average Distance to Default using the Merton Distance to Default model, the data obtained monthly for each bank (Kliestik et al., 2015).

Table 1. Distance to Default Result

	DD	2015	2016	2017	2018
INA	Mandiri	4396,82	5447,74	2811,13	2978,08
	BRI	3047,82	3938,25	2056,99	2259,58
	BNI	5417,20	6265,39	2652,77	2799,81
	BTN	3805,72	4952,32	2049,92	2263,30
	BJB	2416,17	926,62	907,09	989,20
	Bukopin	13454,47	9775,11	7870,67	4730,13

	DD	2015	2016	2017	2018
MAL	Maybank	5379,14	4893,98	5091,32	6572,97
	CIMB	2167,13	1881,70	2340,91	4307,63
	Public bank	1916,83	2559,71	3892,05	4285,09
	RHB	14722,41	22562,57	23765,51	17806,61
	Affin bank	2903,97	2654,62	3824,18	5329,29
	Alliance bank	2229,43	1984,19	2122,58	5512,76
PHI	BDO	2016,63	3158,13	1879,53	2446,30
	Metropolitan	4915,17	14069,12	6263,71	8552,00
	BPI	2252,20	6740,58	5802,65	8716,60
	Security bank	2979,42	3383,97	2176,92	2649,38
	East west	10380,19	9756,11	5115,47	4738,53
	BOC	2756,73	2671,46	3368,90	2888,23
THA	Bangkok bank	7390,04	6557,24	7942,64	7635,28
	Siam bank	2536,97	2906,52	4158,38	4526,82
	Kasikorn	14294,27	18765,61	19159,15	22582,94
	Krung Thai	4341,44	6250,25	7348,21	8212,53
	Thanachart	5476,67	6582,71	6736,09	7606,09
	Tisco	6571,87	4796,55	1826,67	1861,91
SIN	DBS	4445,02	7767,69	5479,90	5121,26
	OCBC	6361,76	10368,18	6178,13	6523,68
	UOB	4933,95	7543,62	6579,04	6541,45
	Hong Leong	5478,31	12733,78	7275,79	4101,15
	Singapura	16753,29	16802,38	14507,02	16309,89
	Gk Goh	21410,26	19284,47	20196,52	22764,12

A higher distance to default implies higher financial stability in the distance between market value of banks to the default risk. In contrast, a high degree of Lerner index implies the higher market power of banks and low market competition level. There are several root unit testing methods in the STATA and Eviews, in this study, the test used was ADF - Fisher Chi-square, where Fisher's test is possible for unbalanced panel data (Ekananda & Suryanto, 2021; Greene, 2018). The Fisher Chi-square ADF test is used with lag (1), with the results of testing all stationary variables at the level with a significant level of 1% (Table 2).

Table 2. Panel Unit Root Test Levin, Lin & Chu t

Variable	Statistic	P-Val	Variable	Statistic	P-Val
DtoD	-8.17092	0.0000	CAR	-1.12422	0.0000
ZCO	-179.983	0.0000	LernerD	-62.043	0.0000
LernerL	-63.8299	0.0000	Liquidity	-10.9411	0.0000
gGDP	-14.1528	0.0000			

To ensure the selection of our best models, we applied Redundant Fixed Effects Tests. The common effect Model assumes no heterogeneity of corporate credit share by

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country. On the contrary, the random effect model assumes no corporate credit share heterogeneity by country. Greene (2018) explains that in the analysis of panel data models, we can use the Fixed Effect Model (FEM) regression model or the Random Effect Model (REM). The Hausman test can be performed if we find a suitable regression model. Ho shows the model using REM, while if H_0 is rejected. The result is that FEM will be used (Table 3). Model I and III used Country as ID. Model II and IV used bank as ID.

Tabel 3. Test Random Effect

ID	Equation	CEM vs FEM			FEM vs REM	
		d.f.	F-stat	Prob	F-stat	Prob.
Country	Model I	(4,230)	4.46	0.00	21.05	0.0008
	Model II	(4,230)	4.44	0.00	21.99	0.0005
Bank	Model III	(29,205)	17.88	0.00	101.50	0.0000
	Model IV	(29,205)	4.34	0.00	16.58	0.0134

We use Terasvirta Sequential Tests. Tests are based on the third order. In the Taylor expansion alternatives equation: $b_0 + b_1*S[+ b_2*S^2 + b_3*S^3 + b_4*S^4]$. The Null Hypothesis H_{03}: $b_1=b_2=b_3=0$. We define GDP, CAR and Liquidity as the threshold variables. The results of the linearity test are shown in Table 4. Table 4 explains that the application of the threshold can be made. The test results of all threshold variables indicate that the linear model is rejected. If we use a linear equation, the coefficients show a nonlinear impact. Nonlinear impact (threshold regression) can be interpreted as the independent variable's impact is not the same for all data conditions. The threshold application can be made to explore the impact of changes in the condition of the threshold variable. Table 4 proves the H1: There are non-linearity influences of banking competition on financial stability. Further studies can be seen in the research by (Ekananda & Suryanto, 2021). The proper method will produce more efficient estimated econometric equations. The size of the sum square of residual (SSR) is used to determine a more efficient method (Mahjus Ekananda & Suryanto, 2021 and Greene, 2018). Table 4 and Table 6 summarize the SSR values of the various methods used in the study.

Table 4. Linearity Tests

Threshold	Model III			Model IV		
	CAR	GDP	Liq	CAR	GDP	Liq
F	2.76	5.12	3.71	4.79	8.30	3.27
d.f.	(10, 300)	(10, 300)	(10, 300)	(10, 300)	(10, 300)	(10, 300)
p-value	0.00	0.00	0.00	0.00	0.00	0.00
Linear	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected

*) Original model is rejected at the 5% level using H03. +)at the 5% level using H03.

Model I was a Fixed Effect model with five country effects. Regression uses the Eviews application, which applies the Cross-section SUR (PCSE) standard errors &

covariance (d.f. corrected) and Linear estimation after a one-step weighting matrix. Model I (Table 5) assumed that each country has its different nature. A higher distance to default implies higher financial stability in the distance between market value of banks to the default risk. An increase in GDP growth results in a decrease in financial stability. The higher market power of banks on loans (lower market competition of banks on loans), resulted in a decline in financial stability. Likewise, the higher market power of banks on deposits (lower market competition of banks on deposits) has resulted in increased financial stability (Barbosa et al., 2015).

Table 5. Fixed Effect for Bank and Country

Dependent		Ln(DtoD) : Model I for country			Ln(ZCO) : Model II for bank	
Indep	**sign**	**Coef**	**t-Stat**	**Sign**	**Coef**	**t-Stat**
C		9.642	21.877		3.959	15.261
LERNERL	-	-4.391	-4.9998	+	-1.512	-2.905
LERNERD	+	0.647	3.055	-	-0.439	-1.714
GDP	-	-0.075	-2.027	+	0.022	1.393
CAR	-	-0.057	-1.738	+	0.040	1.635
LIQUIDITY	+	0.002	1.240	-	-0.006	-2.044
AdjR2		0.280			0.372	
F-stat		13.947			6.211	
SSR		140.119			101.708	

In model II (Table 5), financial stability was measured by Ln(ZCO), showing that higher ZCO implies lower financial stability. The increase in GDP growth increased the ZCO index (the lower financial stability). The higher market power of banks on loans (lower market competition of banks on loans), increased the ZCO index (lower financial stability). Regression results show parameters that are not significant. Expected direction of influence is not proven. Likewise, the higher market power of banks on deposits (lower market competition of banks on deposits), resulted in a decrease in the ZCO index (increased financial stability). This result follows the Barbosa et al. (2015) research.

The link between competition and financial stability in financial institutions has been a subject of academic arguments; many researchers have aimed to determine the influence of banking competition following a series of events, such as economic regulation, on financial stability. This paper used the sample of two large banking firms, two medium-sized firms, and two small firms in each Southeast Asian country to represent banking competition from 2012 to 2021.

Models I and II do not consider the differences in GDP, CAR and liquidity regimes. In the following analysis, we apply threshold regression to produce complete analysis. Table 6 illustrates the general regression relationship between the Distance to Default, previous Distance to Default, Lerner index, GDP growth, and capital adequacy ratio. The threshold regression was used for panel data (1) regression with

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the full set of the model (2) regression with Lerner index only for loans with another complete variable (3) regression with Lerner index only for deposits with another complete variable.

Model III (Table 6) explains the regression results where the equation is divided at a certain threshold. Specifically for Model III, the dependent variable is Ln(DtoD). A higher distance to default implies higher financial stability in the distance between market value of banks to the default risk. An increase in GDP growth results in a decrease in financial stability. The higher market power of banks on loans (lower market competition of banks on loans), resulted in a decline in financial stability. Table 5 and Table 6 prove hypothesis H2: the increase in banking competition of deposits commonly influences the decrease in financial stability.

Table 6. Threshold regression (Model III)

Ln(DtoD)		GDP < 6.03 -- 222 obs		6.03 <= GDP -- 78 obs		CAR < 12.76 -- 252 obs		12.76 <= CAR -- 48 obs		LIQ < 17.73 -- 169 obs		17.73 <= LIQ -- 131 obs	
		1	2	3	4	5	6	7	8	9	10	11	12
		Coef	t-stat	Coef	t-stat	Coef	t-stat	Coef	t-stat	Coef	t-stat	Coef	t-stat
LERNERL	-	-4.32	-4.55	-3.45	-1.34	-5.63	-6.03	2.57	0.99	-4.87	-4.50	-2.88	-2.35
LERNERD	+	0.79	3.66	-0.18	-0.24	0.90	3.90	0.62	1.44	0.32	0.95	1.06	4.09
GDP	-	-0.11	-2.04	0.16	1.88	-0.08	-2.09	-0.14	-0.65	-0.09	-2.07	-0.07	-1.67
CAR	-	-0.06	-1.54	-0.20	-2.92	-0.12	-3.01	-0.03	-0.45	-0.07	-1.99	-0.13	-3.40
LIQUIDITY	+	0.00	1.57	-0.01	-0.85	0.01	1.34	-0.06	-2.48	0.01	0.83	0.00	2.37
AdjR2		0.30				0.32				0.32			
SSR		134.82				130.78				130.67			

N of observations= 30 Period included T = 10, N of balanced panel observations= 300

Likewise, the higher market power of banks on deposits (lower market competition of banks on deposits), resulted in increased financial stability. Table 5 and Table 6 prove hypothesis H3: Commonly, The increase in banking competition for loan influence the increase in financial stability. This result follows the Barbosa et al. (2015) research. The effect of market competition on loans and deposits occurs evenly at all levels of GDP, CAR and liquidity. The low significance level of GDP and CAR in Table 5 has been explained in Table 6. The effects of GDP and CAR are not uniform for several regimes.

Table 7 shows the general regression relationship between Z-score, previous Z-score, Lerner index, GDP growth, and capital adequacy ratio using the threshold method of panel data. (1) regression with full set of the model (2) regression with Lerner index only for loan with another variable complete (3) regression with Lerner index only for deposit with another variable complete. A higher Z-score implies a high degree of financial fragility, greater bank income volatility, and high risk of bank capitalization. In contrast, a high Lerner index score implies a high bank market power with low competition level. The table's capital adequacy ratio shows each country's capital burden.

Table 7. Threshold regression (Model III)

Ln(ZCO)		GDP < 4.91 138 -- obs		4.91 <= GDP -- 162 obs		CAR < 12.61 -- 245 obs		12.61 <= CAR -- 54 obs		LIQ -- 300 obs	
		1	2	3	4	5	6	7	8	9	10
	Sign	Coef	t-stat	Coef	t-stat	Coef	t-stat	Coef	t-stat	Coef	t-stat
LERNERL	+	2.95	2.03	-2.74	-1.85	0.90	0.72	2.79	1.05	0.21	0.13
LERNERD	-	-0.69	-2.13	-0.36	-1.02	-0.85	-2.68	-1.38	-3.24	-0.62	-1.64
GDP	+	-0.02	-0.24	0.35	7.02	0.11	3.51	0.70	3.78	0.13	3.88
CAR	+	0.27	10.03	0.13	6.30	0.28	12.45	0.03	0.52	0.23	11.66
LIQUIDITY	-	-0.01	-2.72	-0.01	-2.15	-0.01	-3.26	-0.01	-0.27	-0.01	-2.41
AdjR2		0.34				0.330329				0.262	
SSR		105.01				106.8351				86.23	

N of observations= 30 Period included T = 10, N of balanced panel observations= 300

Model IV (Table 7) describes the regression results in dividing the equation into two regimes. Specifically for Model IV, the dependent variable is financial stability measured by Ln(ZCO), showing higher ZCO implying lower financial stability. The increase in GDP growth increased the ROAA (the lower financial stability) index. Table 7 proves the hypothesis H4: The increase in economic growth influences the decrease in financial stability.

The higher market power of banks on Loans (lower market competition of banks on Loans/ LernerL), resulted in an increase in the ZCO (the lower financial stability) index at a low GDP level. In the CAR and Liquidity regime, the effect is not significant and is not in the expected direction. If we look at Table 5, it appears that the LernerL Impact does not match the expected sign. Table 7 proves the hypothesis H2: commonly, the increase in banking competition of deposits influences the decrease in financial stability (ZCO). Likewise, The higher market power of banks on deposits (lower market competition of banks on deposits), resulted in increased financial stability. Table 7 proves the hypothesis H3: The increase in banking competition for loan commonly influences the increase in financial stability (ZCO).

The higher market power of banks on deposits (lower market competition of banks on deposits/ LernerD), decreased the ZCO index (increased financial stability). The direction of change occurs in almost all applied regimes. These results support Table 5 where the effect of LernerD is negative but insignificant. Significant results only occur in certain economic regimes, namely at low GDP and CAR levels. This result follows the Barbosa et al. (2015) and Van den End (2016) research.

The effect of market competition on loans and deposits occurs evenly at all levels of GDP, CAR and liquidity. The low significance level of GDP and CAR in Table 5 has been described in Table 6. The effects of GDP and CAR are uneven across several regimes. The Z-score is positively linked with previous Z-scores. The Lerner index of market power had a significant connection with Z-score only in loan market, it shows support for competition-stability hypothesis. While in deposit market show support for

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competition-fragility hypothesis our result is the same as Kabir & Worthington (2017) and Kanga et al. (2021). Bank competition-fragility portion in deposit increased in degree of competition makes bank not stable in deposit market. Bank with higher market power in loan market tend to increase bank income volatility, which suggests Charter value hypothesis exist bank with higher market power tend to make it harder to repay loan, bank with high market power are not stable in loan market competition but stable in deposit market competition. This result follows the Barbosa et al. (2015) and Van den End (2016) research.

Table 8 presents the data distribution smaller than the GDP, CAR and LIQ thresholds. This analysis is also by (Ekananda, 2019). We can combine Table 8 with Table 6. The coefficients obtained in Table 6, GDP < 4.69 (Table 6, columns 1 & 2) are from the countries mentioned in row 1, in Table 8. 90 observations are from Malaysia and Singapore. Regression results for CAR < 11.61 (Table 6, columns 5 & 6) are from Malaysia, Thailand, Philippines and Singapore. Regression results for Liq < 17.73 (Table 6, columns 9 & 10) are equally distributed across countries. Table 8 explains the impact of banking competition variables on financial stability in more detail. The regression results are detailed because the sample is divided into two according to the threshold value. This threshold value can be examined further by looking at the countries of origin of these banks. Further analysis can deepen the relationship between financial stability and the country's economy. The country's economy through GDP.

Table 8. Distribution of data below the threshold

	Model III	INA	MAL	THA	PHI	SIN	TOTAL	%
1	GDP < $\tilde{k}$	0	6	42	6	36	90	37.5
2	CAR < $\tilde{k}$	6	42	42	42	48	180	75.0
3	LIQ < $\tilde{k}$	30	28	21	39	18	136	56.67

Table 9 describes data distribution smaller than the GDP, CAR and LIQ thresholds. We can combine Table 9 with Table 7. The coefficient obtained for GDP < 4.69 (Table 7, columns 1 & 2) is from the countries mentioned in row 1, Table 9. 108 observations are from Malaysia and Singapore. Regression results for CAR < 11.61 (Table 7, columns 5 & 6) are from Malaysia, Thailand, Philippines and Singapore. Regression results for Liq < 17.73 (Table 7, columns 9 & 10) are equally distributed across countries. The distribution of country data in Table 9 is similar to Table 8.

Table 9. Distribution of data below the threshold

	Model IV	INA	MAL	THA	PHI	SIN	TOTAL	% data
1	GDP < $\tilde{k}$	6	18	42	6	36	108	44
2	CAR < $\tilde{k}$	18	48	48	48	48	210	86.0
3	LIQ < $\tilde{k}$	8	19	2	29	9	67	28.02

Table 10 shows the Payoff matrix of impact banking competition on financial stability using two competition measurements and two financial stability measurements. Our results show a reason and benefit for separating the sample from the threshold criteria to obtain a more specific impact (Models III and IV) than the general impact (Models I and II). We have chosen the FE model to consider heterogeneity between countries and banks in these four models.

Table 10. Payoff Matrix of Impact Banking Competition to Financial Stability

Model	Financial Stability	LernerL	LernerD	GDP
Model I	DtoD	(-)	(+)	(-)
Model II	ZCO		(-)	(+)
Model III	DtoD	(-)	(+)	(-)
Model IV	ZCO	(+)	(-)	(+)

Specifically, the result from our calculation can be summarized as matrix, higher Lerner index means higher monopoly power low degree of competition, and vice versa lower score Lerner index means the degree competition is higher. The higher Distance to Default means banks are far from the risk of becoming default. While Zscore ROAA is a measure of bank income volatility positive relationships mean there is a disruption of banking solvency from banking operations (Kasman & Kasman, 2015).

From the findings above, it can be stated that banking competition has various impacts on bank stability. Each bank can have advantages in different variables. This diversity will have an impact on bank competition, competitiveness, and stability. The Lerner Index calculates the existence of market power by comparing the price difference and marginal cost and dividing it by price. The higher the Lerner Index value, the greater the market power, which means that the bank can set prices above its marginal cost. When this happens, industry competition will decrease.

This study analyzes the impact of banking competition in the ASEAN region on bank stability, indicating competition stability or fragility. This research is consistent with the research penelitian (Anginer et al., 2014; Berger et al., 2009; Chu, 2015; Davis et al., 2020; Dwumfour, 2017; Fu et al., 2014; Köhler, 2015; Yusgiantoro et al., 2019a). This study also uses the distance-to-default method to measure banking stability using a market approach (Anginer et al., 2014; Chan-lau & Sy, 2007).

High competitiveness in the ASEAN region will also impact banking stability. Competition to compete for market share that is not accompanied by the principle of prudence will have a negative impact on banking stability. Increased competition between banks in the market will force banks to make efficient (Jeon et al., 2011). Inefficient banks will be unable to compete with more efficient banks. If an inefficient bank is not immediately merged/acquired, it will cause the bank to collapse. Banks have a systemic impact if banks compete with each other and cause a collapse, the

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effect will spread to other banks terbuka (Lee & Fukunaga, 2014; Weill, 2009). This condition is undoubtedly a dangerous condition for the economy as a whole. Each ASEAN-5 country, especially Indonesia, must anticipate the high competition that occurs in ASEAN-5 banking (Severe, 2016).

In current developments, several banks in the ASEAN region are carrying out a product diversification strategy by selling products or services through consulting services, investment banking, multi-finance or bancassurance, and other non-bank services (Dang, 2020). One of the factors that can encourage ASEAN banking competition is the ASEAN Economic Community (AEC). Economic liberalization and integration through the AEC have made the market within ASEAN more open (Lee & Fukunaga, 2014; Weill, 2009).The enactment of the ASEAN Economic Community (AEC), where banking in ASEAN is integrated, makes the ASEAN-5 banking competition more competitive (Severe, 2016).

Competition does not only occur between large foreign banks and local banks but also between large banks in ASEAN, which compete with each other for markets outside their own countries. Large banks, especially in ASEAN-5 countries, are implementing several strategies to compete with each other for control of the regional market. With the integration of the ASEAN economy, which aims to create a single market, it will be very profitable for a bank if it can dominate the regional market with a broader market reach. The formation of the ASEAN Economic Community (AEC) led to policies related to banking in ASEAN-5 (Chan et al., 2016). One of these policy frameworks is the ASEAN Banking Integration Framework (ABIF) which is an ASEAN initiative to facilitate ASEAN banking integration, namely by increasing the role of ASEAN banks in the ASEAN region through providing convenience in terms of market access and flexibility to operate in ASEAN member countries (De Jesus & Torres, 2017). The banking integration process within ABIF uses the mechanism for determining Qualified ASEAN Banks (QAB). QAB is one of the requirements for banks to operate fully in other ASEAN countries. The application of ABIF will provide opportunities and potential for banks to expand into the ASEAN market and gain market access and broader business activities in the ASEAN region. This activity will encourage intense competition between domestic and foreign banks from the ASEAN region (De Jesus & Torres, 2017).

CONCLUSION

The results of our research have proven the H1 hypothesis, where the increase in banking competition of deposits influences the decrease in financial stability. The proof uses models I and III, where the Distance to default is the stability. The proof uses Model I and Model III, where the Z Score measures stability. The nonlinear method succeeded in proving and developing the results of the linear model analysis. Insignificant impacts on the linear model can be broken down and explained using a nonlinear model divided according to a specific threshold value. Market forces'

impact on loans and deposits can be more clearly seen using a nonlinear model. Our results show that the Competition-Fragility hypothesis occurs in the Distance to default measurement. The market power of loans and deposits can stabilize the financial system. This evidence can be seen from the regression Model I and Mel III results. While the Lerner index for loans and deposits shows a different relationship on the ROAA Z-score, the Stability of Competition hypothesis only occurs in the loan market.

For this reason, each local bank must anticipate the entry of ASEAN regional banks into the country so that local banks will not lose competitiveness with foreign banks. Banking is required to increase its efficiency by optimizing the use of its inputs and outputs so that the profit generated is higher. In addition, banks must also anticipate ABIF by raising capital, quality of human resources, and information technology. Digital banking penetration in Asia is growing from time to time. The strategy that can be carried out is to strengthen the banking structure, which can be started by increasing bank capital to increase banks' ability to manage business and risk through mergers and consolidation. However, large banks with sufficiently good capital use a strategy by opening direct branches in other countries of interest to penetrate a broader market. Big banks can also make acquisitions to increase their market share. The management of banking risk management must also be continuously improved. Credit risk management can be carried out by monitoring various efforts to maintain NPLs in all bank business segments. Operational risk management is carried out by implementing Good Corporate Governance (transparency, accountability, responsibility, independence, and fairness) and monitoring compliance with prudential provisions set by the central banks of each country.

The recommended policy to control the level of competition is to set the capital adequacy ratio at an optimal level that can withstand the volatility risk of bank income. We find evidence for the competition fragility hypothesis and the competition stability hypothesis affecting ASEAN countries in 2012-2021. Future research should consider studying the evolution of financial market problems in terms of the level of banking competition for the loan and deposit market with a sample of other countries.

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Antecedents of Intention to Use Ride-Sharing Platform

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Abstract
The Ride-Sharing Platform (RSP) implementation in Indonesia has been emerging recently. The use of this platform is increasing significantly year by year. This study aimed to identify the factors influencing the attitudes and intentions of RSP users in Indonesia. This research discussed the role of customers in service innovation and the relationship between Perceived Usefulness, Perceived Ease-of-Use, Word-of-Mouth (WOM), and Intention to Use RSP from the perspective of TAM and TPB. This research used 208 data originating from 219 samples acquired through questionnaire distribution. The obtained data were then analyzed using the SmartPLS Program. This research shows that Perceived Usefulness, Perceived Ease-of-Use, and word of mouth positively affect the Intention to Use RSP mediated by Customer Attitude toward Service Innovation. This research could contribute to the RSP industry and those who want to join RSP as one of the service providers. This study contributes considerably to the breadth and rigor of the RSP literature from the perspectives of TAM and TPB.

Keywords:
intention to use; perceived usefulness; perceived ease-of-use; word of mouth; customer attitude; ride-sharing platform

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INTRODUCTION

In recent years, the Ride-Sharing Platform (RSP) has gained a special place in customers' minds along with its rapid development. There are various kinds of Platform Sharing, such as Ride-Sharing platforms (RSP), for example, Uber, GoJek, and Grab. Other than that, there are Home-Sharing platforms (HP), for example, Airbnb, OYO, et cetera. In 2020, more than 11.9 million people joined RSP in Sout-East Asia, which will continuously increase. Besides, the total revenue of RSP partners in 2020 reached more than USD 14.2 billion.

According to Davidson et al. (2018), economic sharing is a company's operations that connect numerous economic elements as providers and users in various service fields, such as transportation, lodging, and finance. Providers and users/customers can swap services to meet market demands through this economic sharing, aided by social networking and online platforms (Cheah et al., 2020a). Grab, Uber, GoJek, and AirBnB are examples of online platform-sharing that allow people to make money from idle resources such as vehicles and rooms. On the other hand, the existence of this platform can make it easier for clients who require access to such resources at a lower cost than cabs and hotels.

For customers, the existence of RSP is perceived to provide ease and relatively low cost. This phenomenon is supported by the research conducted by McKinsey, in which 51% of respondents stated that the main reason to use this RSP is ease. In comparison, 20% of respondents commented about the lower cost rather than personal cars or taxis (Heineke et al., 2021). Other features preferred by customers in this kind of platform-sharing are safety, competitive price, and availability. These kinds of features make the RSP selected by the community. Furthermore, this phenomenon can change people's minds and consumption patterns. Finally, this can increase customer intention to use the RSP.

This study discussed the variables influencing customer attitude and intention to use the RSP in Indonesia. Perceived Usefulness, Perceived Ease-of-Use, and Word-of-Mouth (WOM) are the characteristics that affect the intention to use the RSP, with Customer Attitude toward Service Innovation as a mediating variable. Perceived usefulness comprises factors that can make work easier to handle, make something more valuable, and enhance performance effectiveness. Moreover, perceived usefulness has the indicators of usefulness and effectiveness. It describes a measure of trust in which such technology will benefit the users (William & Tjokrosaputro, 2021). As Ozturk, (2016) and Keni (2020) said, perceived usefulness is an individual's intention to adopt new technology. The new technology adoption is believed to be easy to use, easy to learn, and can enhance their performance.

Customers feel comfort and effortlessness when using the RSP technology is referred to as perceived ease-of-use (Stocchi et al., 2019). This variable is used widely in research related to the internet application (Moslehpour et al., 2018). Keni (2020) defined perceived ease-of-use as the customers' assessment. The technology they implement

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will be easy to learn and use. Sharing information about RSP can affect the customers' behavioral intentions and decisions (Iyer & Griffin, 2021; Talwar et al., 2021). According to Keiningham et al. (2018), WOM is the distribution and migration of information by a customer that affects other people. Meanwhile, Arenas-Gaitán et al. (2018) believed that WOM is an oral, interpersonal communication between information sender and receiver. The information receiver regarding the product or service is assumed non-commercial.

Attitudes towards RSP can affect consumer behavior in general. Abdul Aziz & Mohd Dali (2019) argued that attitude refers to an individual's feeling, belief, or preference toward an object, idea, or other individuals. Meanwhile, Lee (2012) described that attitude as the tendency to respond in a certain way, which is consistent. In this research, service innovation is related to the information that follows the trend in a more efficient style and system to enhance the service values. Other than that, service innovation meets the customers' necessities for various products and services (Lee, 2012; Fan et al., 2018). Furthermore, service innovation comprises a company's effort to promote the service values to meet the customers' and market necessities to match the business development trend (Josiam & Henry, 2014).

Intention to use is an individual's readiness to conduct the desired action (Şahin, 2019). An important factor affecting the intention to use the economic-sharing platform is the availability of the service that can fulfill the customers' necessities and access to the platform (Anouze & Alamro, 2020). This research was intended to empirically test the factors influencing the customers' level of RSP adoption. The Theory of Planned Behavior (TPB) was used as the base of this research to evaluate the factors that hinder and motivate customers (Ajzen, 1991, 2012; Pavlou et al., 2007). Furthermore, we used the Technology Acceptance Model (TAM) to broaden the understanding of the technology that affects customers' intention to participate in the RSP (Wang et al., 2006; Wang et al., 2020).

The Theory of Reasoned Action (TRA) is the base of the Theory of Planned Behaviour (Ajzen, 1991), which explains almost all individuals' behavior. This theory successfully predicts and explains an individual's behavior in various contexts (Davis et al., 1989). Ajzen & Sheikh (2013) argued that the Theory of Planned Behavior appeared as one of the most influential working frameworks and popular concepts related to the studies of humanity. In the relationship between Word-of-Mouth (WOM) and Perceived Ease-of-Use, the TPB model can explain more about the users' intentions (Pavlou et al., 2007).

With the expansion of TRA (Davis et al., 1989), the Technology Acceptance Model (TAM) has become one of the conceptual working frameworks to explain why users accept or reject particular information technology. TAM can demonstrate the perceived usefulness and perceived ease-of-use (Davis et al., 1989). The ease-of-use experienced by customers is viewed as an essential factor in affecting the customers' innovation adoption. Meanwhile, perceived usefulness is the extent to which an individual believes their work-related performance will be enhanced after using the technology. Furthermore, many marketing researchers claim that perceived usefulness significantly affects an individual's intention to adopt a particular technology (Ahn et al., 2004). Therefore, TAM is used as one of the fundamentals to explain this research.

Although many researchers have conducted studies about RSP (Puschmann & Alt, 2016), the scientific understanding of RSP is still developing (Lee et al., 2018). Other than that, the studies about using RSP from the customers' perspective still gain minimum attention from academists (Cheah et al., 2020; Möhlmann, 2015; Rayle et al., 2015). Limited empirical studies are performed to reveal how powerful the customer's intention to accept and adopt the RSP (Cheah et al., 2020a).

Based on the phenomenon mentioned above, this research was conducted to fill the gap regarding the minimum understanding of how people are interested in participating in collaborative consumption (Hamari et al., 2016). In addition, the second gap that will be filled in this research is the limitation of RSP from the customers' perspective (Cheah et al., 2020; Möhlmann, 2015; Rayle et al., 2015). This study aims to enrich and expand the analysis of various factors influencing customer attitudes and intentions to use RSP, especially in Indonesia. Furthermore, this research is expected to strengthen empirical studies on RSP that have not gained significant academic attention. (Möhlmann, 2015; Rayle et al., 2015; Hamari et al., 2016; Cheah et al., 2020).

Study that uses attitude toward service innovation among RSP customers in Indonesia as a mediator has not been conducted in Indonesia. So, using this variable in such a relationship becomes the novelty of this research. This research specifically aimed to examine the effect of the advantages that customers experienced and the social impact of customer attitude about the RSP on the intention to use RSP. The factors of perceived usefulness and perceived ease-of-use in using the RSP were employed to measure customer benefits. Meanwhile, the Word-of-Mouth (WOM) variable was used to evaluate the social impact. Furthermore, this study uses attitude toward service innovation as a mediator on the social implications and customer advantages to measure how far the result is on customer intentions in using RSP.

The expected managerial implication from this research is in the form of inputs to the RSP management about several factors that can affect customer attitude and intention to use the RSP. Other than that, persons who want to join as service providers in RSP could examine this study. Moreover, this research is expected to contribute significantly to the robustness and breadth of literature about the RSP in T AM and TPB perspectives.

METHODS

This quantitative research uses a survey through the questionnaire distributed to respondents. Measurement indicator adopted from Cheah et al. (2020). The questionnaire utilized in this research consists of three sections. The first section is screening questions about whether respondents have used RSP lately. The second section comprises demographic data, while the third contains the construct's items. The five-point Likert scale used in this research is 1 (Strongly Disagree) to 5 (Strongly Agree). Figure 1 show the framework of this research.

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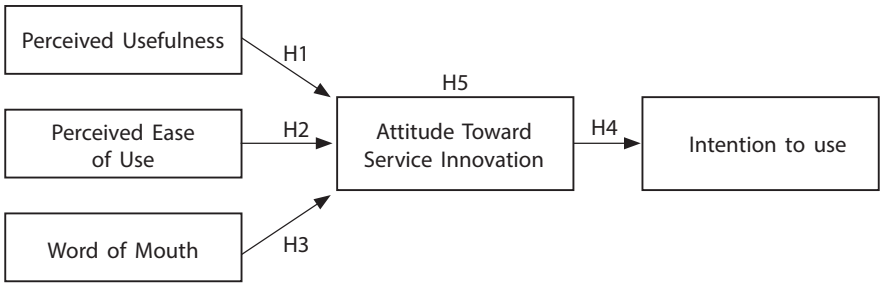
Figure 1. Research Framework



The sample selection technique of this cross-sectional research was convenience sampling. 219 respondents participated in the survey, but 11 people never used the ride-sharing platform. Consequently, they were not involved in a further stage. So, 208 samples from 219 respondents can be used for further data processing. Hair et al. (2015) mentioned that the samples should be over 100 respondents. Data analysis in this research was initiated with the validity and reliability tests and then continued by Structural Equation Modelling (SEM) using the SmartPLS Program version 3.2.8. The construct validity test was performed using outer-loadings, cross-loadings, and Average Variance Extracted (AVE) tests. Meanwhile, the reliability test was performed by examining composite reliability and Cronbach's alpha (Latan & Noonan, 2017). Table 1 show the operationalization from the variable of this research.

Table 1. Variable Operationalization

Variables	Indicator	Code
Perceived Usefulness	The application is simple-to-use	PUS1
	The service is delivered on-time.	PUS2
	The price is fair.	PUS3
	The service is available across the city.	PUS4
	The service is reliable.	PUS5
	The driver is familiar with the route.	PUS6
Perceived Ease of Use	The customer can quickly order a variety of services.	PE1
	The customer has a smartphone to place the order.	PE2
	The customer expects to place the order comfortably.	PE3
	The customer expects to receive hassle-free service.	PE4
	The customer does not find difficulty in ordering the PEB service.	PE5
Word of Mouth	The customer will say favorable words about PEB services in general to others.	WM1
	The customer recommends the services regarding ride-sharing service.	WM2
	The customer suggests the services to friends and family.	WM3
Attitude toward service innovation	The ride-sharing app is perfect.	AI1
	The ride-sharing service helps one feel at ease.	AI2
	The first preference is ride-sharing service.	AI3
	The customer likes the ride-sharing service.	AI4
Intention to use	The customer intends to utilize or acquire the ride-sharing service.	IU1
	The customer thinks about acquiring or utilizing the ride-sharing service.	IU2
	The customer wishes to utilize or purchase the ride-sharing service.	IU3
	The customer plans to acquire or utilize the ride-sharing service.	IU4

RESULT AND DISCUSSIONS

As shown in Table 2, most of the respondents are male (65.9%), having the occupation as students (88%), domiciled in Jakarta Special Region (74.5%), aged between 17-22 years old (84.6%), undergraduate students (72.6%), and the monthly revenue < IDR. 3,000,000 (66.8%). In the first run of data analysis, the indicator of PUS 1 has a loading-factor less than 0,6. Therefore, such an indicator was excluded in the next data-processing stage. The construct reliability and convergent validity can be seen in Table 3.

Table 2. Profile of the respondents

		Frequency	Percentage
Gender	Male	137	65.9
	Female	71	34.1
Occupation	Student	183	88.0
	Employee	23	11.1
	Other	2	1.0
Age	17 - 22	176	84.6
	23 - 30	30	14.4
	> 30	2	1.0
Education	Undergraduate	151	72.6
	Graduate	57	27.4
Revenue (000)	< 3.0000	139	66.8
	3.000 – 6.000	53	25.5
	> 6.000	16	7.7
Total		**208**	**100.0**

All variables have passed the reliability (internal-consistency) test with the value of Composite Reliability between 0.70 and 0.95, the convergent-validity test with the Average Variance Extraction (AVE) value greater than 0.50. There was no multicollinearity effect among Perceived Usefulness, Perceived Ease-of-Use, and Word-of-Mouth, with the VIF value less than 5 (Hair, Ringle, & Sarstedt, 2011). The result can be seen in Table 4.

Customer attitude toward Service Innovation has a Coefficient of Determination of 0.505 (see Table 5). This result means that the variation can explain a 50.5% variation in Customer attitude toward Service Innovation in terms of perceived Usefulness, Perceived Ease-of-Use, and Word-of-Mouth. Meanwhile, 57.2% of Intention to Use RSP can be defined by the Customer Attitude toward Service Innovation variation.

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Table 3. Construct Reliability and Convergent Validity

Variable	Indicator	Factor Loading	Composite Reliability	Cronbach's Alpha	Average Variance Extraction
Perceived Usefulness	PUS1	-	0.849	0.778	0.530
	PUS2	0.681			
	PUS3	0.736			
	PUS4	0.749			
	PUS5	0.764			
	PUS6	0.707			
Perceived Ease of Use	PE1	0.782	0.860	0.798	0.552
	PE2	0.643			
	PE3	0.760			
	PE4	0.787			
	PE5	0.734			
Word-of-Mouth	WM1	0.871	0.871	0.777	0.692
	WM2	0.800			
	WM3	0.823			
Attitude toward Service Innovation	AI1	0.741	0.863	0.788	0.612
	AI2	0.831			
	AI3	0.769			
	AI4	0.785			
Intention to Use	IU1	0.784	0.871	0.803	0.630
	IU2	0.710			
	IU3	0.859			
	IU4	0.814			

Table 4. Result of the Multicollinearity Test

Variable	Value	Conclusion
Perceived Usefulness	VIF = 1.526	No multicollinearity
Perceived Ease-of-Use	VIF = 1.443	No multicollinearity
Word-of-Mouth	VIF = 1.507	No multicollinearity

Table 5. Coefficient of Determination

Effect	Coefficient
Attitude toward Service Innovation	$R^2 = 0.505$
Intention to Use	$R^2 = 0.572$

The hypotheses tested in this research were divided into two parts: (1) Direct effect; and (2) Indirect effect through mediating variable. H_1, H_2, H_3, and H_4 are the direct effect hypotheses, while H_4 reflects the indirect effect hypothesis. The premise is accepted if the t-statistics are greater than 1.96 and the p-value is less than 0.05 using the 95% significance level. The results of t-statistics, p-values, and path coefficients for the direct effect and relationship hypotheses can be seen in Table 6. In contrast, the indirect effect and relationship hypothesis can be seen in Table 7.

The variables of Perceived Usefulness and Perceived Ease-of-Use have positive, statistically significant effects and a strong relationship with Customer Attitude toward Service Innovation (Table 6). Meanwhile, the WOM variable has a positive, statistically significant impact and strong relationship with Customer Attitude toward Service Innovation (Table 5). Besides, the Customer Attitude toward Service Innovation variable has a positive effect, statistically significant, and a pretty intense relationship to Use RSP (Table 6). The results of this research show that H_1 - H_4 were supported.

Table 6. Inner-Model Test

	Effect	Coefficients			Conclusion
		β	p-Value	f^2	
H_1	PUS → AI	0.266	0.001	0.093	Supported
H_2	PE → AI	0.209	0.003	0.061	Supported
H_3	WM → AI	0.389	0.000	0.203	Supported
H_4	AI → IU	0.756	0.000	1.337	Supported

Source: Data Processed Using SmartPLS Version 3.2.8

Description:

PUS : Perceived Usefulness

PE : Perceived Ease-of-Use

WM : Word-of-Mouth

AI : Attitude toward Service Innovation

IU : Intention to Use

Table 7 shows the results test of Customer Attitude toward Service Innovation (AI) as a mediator in the relationship between the antecedents of the Intention to Use (IU) RSP. The antecedents are Perceived Usefulness (PUS), Perceived Ease-of-Use (PE), and Word-of-Mouth (WOM). It shows that each p-value is less than 0.05. Thus, all paths are supported.

Table 7. The result of the Mediation Test

	Path	Coefficient	p-Value	Conclusion
H_{5a}	PUS → AI → IU	0.200	0.001	Supported
H_{5b}	PE → AI → IU	0.155	0.003	Supported
H_{5c}	WM → AI → IU	0.291	0.000	Supported

This research attempted to fill the gap about the limited understanding of people's interest in participating in collaborative consumption (Hamari et al., 2016) through the customer's perceived advantage and its social effect on customer attitude and intention to use RSP. The customer's perceived benefit was measured using the Perceived Usefulness and Ease-of-Use variable. Meanwhile, Word-of-Mouth was used to measure the social effect. In more precise terms, this study's goal was to see how WOM, perceived usefulness, and perceived ease-of-use impacts on the intention to use RSP interacted with Customer Attitude toward Service Innovation as a mediating variable.

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All indicators in this study passed the reliability test with a standardized-loading value of more than 0.50. Furthermore, the internal consistency reliability has a CR value of 0.70 to 0.95, indicating that all indicators are dependable. The AVE values of all variables in the convergent-validity test are greater than 0.50. All variables in the discriminant-validity test had an HTMT ratio of less than 0.90. (See Table 2). All variables passed the validity and reliability tests based on the results of these tests. There was no multicollinearity among the antecedents of Customer Attitude toward Service Innovation in the inner-model test, in which the VIF value was less than 5 (Hair, Ringle, & Sarstedt, 2011). Moreover, 50.5% variation in Customer Attitude toward Service Innovation can be explained by Perceived Usefulness, Perceived Ease-of-Use, and Word-of-Mouth. Meanwhile, 57.2% variation of the Intention to Use RSP is affected by Customer Attitude toward Service Innovation.

H_1–H_4 were supported by data with p-values less than 0.05, indicating that each hypothesis establishes that the independent variable has a substantial effect on the dependent variable. The Beta values, however, illustrate that each independent variable affects the dependent variable. Word-of-Mouth significantly influences Customer Attitudes toward Service Innovation. Furthermore, with a (beta) value of 0.756 (f2 = 1.337), Customer Attitude toward Service Innovation has a high and significant effect on Intention to Use RSP.

In the relationship between perceived usefulness and customer attitude toward service innovation, the path coefficient is 0.263, and the p-value is 0.001. The value of f^2 is 0.090, thus showing a weak effect in the relationship. Based on the path coefficient, f^2, and p-value, then H_1 was accepted. This result indicates that the perceived usefulness increases the customer attitude towards service innovation in RSP in Indonesia, but in a weak effect. This result is similar to the research of Aziz & Dali (2019) in Malaysia and Cheah et al. (2020) in Australia and New Zealand. It showed that perceived usefulness is a positive and significant predictor of customer attitude toward service innovation. Perceived usefulness in this research is measured through the indicators of safety, price, service availability, and drivers' reliability in providing the service.

The path coefficient of the association between perceived ease-of-use and customer attitude toward service innovation is 0.217, the p-value is 0.003, and the f^2 value is 0.0054. The effect of perceived ease-of-use on customer attitude toward service innovation indicates that H_2 was accepted, consistent with Lee (2012) and Cheah's findings (2020). The measurement indicators of Perceived ease-of-use are the speed and ease of using the service and the use of a smartphone. This result shows that perceived ease-of-use predicts attitude toward service innovation among RSP customers in Indonesia.

The outcome of the third hypothesis test on the effect of WOM on customer attitude toward service innovation: The path coefficient is 0.385, and the f^2 value is 0.0192. It indicates that the link has a weak influence. H_3 was accepted based on the path coefficient, f^2, and p-value. This result supports the findings of Teng et al. (2016) and Cheah (2020). They found that WOM is a favorable and significant predictor of

customer attitude toward service innovation. Besides, Han et al. (2019) also found that Word-of-Mouth can influence an individual's attitude in Korea. The research shows that if WOM increases, the attitude toward service innovation among RSP customers in Indonesia will also increase significantly but not substantially. This phenomenon strengthens the results of previous research in various countries, such as Korea, New Zealand, and Australia.

In the relationship between customer attitude toward service innovation and intention to use RSP, the path coefficient is 0.756; the p-value is 0.000 (at 95% significance level), and the f^2 value is 1.337. It indicates a strong influence in such a relationship. H_4 was accepted, indicating that customer attitude toward service innovation becomes a positive, strong, and significant indicator of RSP usage intention. It means that the increase in customer attitude toward service innovation can significantly and enormously increase the intention to use RSP. This conclusion is consistent with the findings of Aziz & Dali (2019) in Malaysia and Cheah's (2020) studies in Australia and New Zealand in the RSP industry. The attitude towards service innovation is measured through the ease and comfort in using the RSP dan service applications provided by the RSP operators.

The last test aimed to reveal the effect of customer attitude toward service innovation as a mediator in the relationship between perceived usefulness, perceived ease-of-use, and Word-of-Mouth on the intention to use RSP. The result shows that the path coefficients of H_{5a}, H_{5b}, and H_{5c} are consecutively 0.164, 0.199, and 0.291. Each of these has a p-value less than 0.05. Based on the path coefficient, and p-value, then H_5 was accepted. So, the customer's perceived benefits (perceived usefulness and perceived ease-of-use) and the social impact (WOM) significantly affect the customers' intention to use RSP. Also, customer attitude towards service innovation affects the relationship between customer perceived benefit and social impact on the intention to use RSP positively dan significantly as mediation. This result is similar to the Jahangir & Begum (2008), Aziz & Dali (2019), and Cheah (2020) studies. Their result was a positive and significant effect of perceived usefulness, perceived ease-of-use, and Word-of-Mouth on the intention to use RSP, with customer attitude toward service innovation as a mediating variable.

After conducting the empirical research to measure the customer benefit as the social consequences of RSP in the relationship to the intention to use, the result can deeper the understanding and robustness of customers' participation in collaborative consumption in Indonesia. Based on the objectives, this research empirically can enrich and broaden the knowledge on various factors that can affect customer attitude and the intention to use RSP. This research result shows that the attitude toward service innovation among RSP customers in Indonesia can substantially mediate the relationship. This finding becomes the novelty of this research. It can fill the research gap related to the limitation on RSP from customers' perspective and enrich the understanding of collaborative consumption.

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CONCLUSION

This study shows that customers' attitudes toward service innovation are positively influenced by perceived usefulness, ease-of-use, and Word-of-Mouth. Furthermore, customer attitudes toward service innovation positively and significantly impact customer willingness to use the RSP. Also, customers' perceptions of usefulness, ease-of-use, and Word-of-Mouth have a favorable and significant impact on the intention to use RSP, which is mediated by the attitude toward service innovation.

The contribution and suggestion of this study to the RSP industry and people who want to participate as RSP providers is the understanding of the antecedents of the intentions to use RSP in Indonesia. The importance of perceived usefulness, perceived ease-of-use, and WOM are antecedents of the intention to use RSP, mediated by customer attitude toward service innovation, especially in Indonesia, could enrich the understanding of the interested people.

Moreover, this research can enrich and strengthen the application of TPB and TAM. The application of TPB becomes fundamental in explaining WOM and the intention to use RPS, which can finally enhance and reinforce similar research literature. This research also uses TAM in the context to explain the attitude toward service innovation, perceived usefulness, and perceived ease-of-use of the RPS. The result can also strengthen and broaden the application of TAM in the research about RPS from the customers' perspective.

Aside from that, suggestions for other researchers to use different variables in the research, such as Value Co-Creation (Nadeem 2020). As the sample of this research is only in Jakarta, it would be better if future research could extend to a broader area and more specific content.

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Effect of Individual Attributes toward Financial Management Behavior through Locus of Control

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Abstract
Only a few studies have examined the use of comprehensive variables in determining financial management behavior, though the model involves many other variables. Therefore, this study aimed to examine the locus of control as a mediator variable in the effect of financial attitude and knowledge, income, and spiritual intelligence on financial management behavior. It used a quantitative descriptive method and involved 391 respondents determined through convenience sampling. The results showed that financial attitude and spiritual intelligence significantly impact financial management behavior through locus of control. Whereas in the other two variables, namely financial knowledge, and income, the role of the mediator does not function effectively, so it does not have an indirect effect. These findings have implications for individuals to practice financial readiness in daily financial life. The information obtained also strengthens the role of self-control in financial management.

Keywords:
finance; financial management behavior; income; spiritual intelligence; locus of control

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INTRODUCTION

Most Indonesians have a low financial management ability and are consumptive in satisfying their desires. Geo-times, a study by LIPI, ranked Indonesia third of 106 countries regarding high confidence levels in consumptive behavior (Asih & Khafid, 2020). Most people practice impulsive buying, and about 74% of purchasing decisions are made at stores. Furthermore, the decisions are based on want, not the need to buy a particular product or brand (Kumar et al., 2021; Kusi et al., 2021; Triwidisari et al., 2018).

The increasingly progressive era impacts the use of the Internet to consume content, news and entertainment, and shopping (Mouratidis & Papagiannakis, 2021; Yabe et al., 2021). The Internet has taken a significant role in the lives of Indonesians. Its penetration in the country has exceeded 50% of the population. As many as 143.26 million of 262 million people are estimated to have used the Internet, of which 49% are millennials. Moreover, internet users are increasing during the COVID-19 pandemic. In this study, most respondents spent more than 8 hours daily accessing social media, chatting platforms, internet banking services, online buying, entertainment, and educational content. Since March, the Indonesian government has required online learning to prevent coronavirus from spreading, increasing the number of internet users.

Moreover, the Internet is used for consumption or communication and carrying out various transactions in transportation, buying food, sightseeing, and shopping for clothes and daily necessities. The convenience of online purchases has made the current generation fulfill their desires more flexibly in buying things for pleasure. Therefore, the digital culture and internet use for these transactions help develop highly consumptive generations. Herdjiono et al. (2016) stated that the financial management behavior of the more consumptive Indonesians leads to irresponsible behaviors such as investing and future budgeting and a lack of saving and emergency-fund planning. In line with this, the Board of Commissioners and Consumer Protection of OJK stated that the financial knowledge of Indonesians was low at 28%. The people of Malaysia, Thailand, and Singapore had financial knowledge levels of 66%, 73%, and 98%, respectively. One factor causing the low level of financial knowledge is Indonesia's geographical condition, where 60% are in rural areas (Etriya et al., 2019; Lopus et al., 2019). Perry & Morris (2005) and Xiao (2016) found that someone with a high income allows a high spending or consumptive pattern. This condition contrasts with someone with a low income, where the spending pattern is also low. The scenario could be improved by instilling financial management behavior since childhood. It has been an exciting issue, widely discussed recently, and closely related to the consumption behavior of individuals or society.

Financial management behavior is one of the most critical aspects in the financial context. An individual with sound financial management behavior optimizes funds and allocates detailed budgeting to prepare income and outcome plans and other activities (Ghosh, 2018; Kagotho et al., 2017). Financial management is an essential driver in fulfilling needs and achieving financial satisfaction. Hayhoe et al. (2012) and Pham et al. (2012) defined *financial management behavior* as acquiring, allocating, determining,

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and utilizing financial resources. Additionally, Dolan et al. (2012) described this behavior as making a financial decision, harmonizing individual desires and company purposes. Mien & Thao (2015) related financial management behavior with fund management effectiveness. The behavior relates to an individual's financial responsibility while managing finance activity (Ida & Dwinta, 2010). This responsibility describes managing and controlling finance and other assets productively. Effective financial management has several aspects, such as budgeting, retirement debt, and assessing the need for purchases within a reasonable time frame.

This study focused on the financial management behavior of students in master's and doctoral degree programs at the State Universities (PTN) in Jakarta, Indonesia. It was conducted at Universitas Negeri Jakarta, Universitas Indonesia, UPN Veteran Jakarta, and UIN Jakarta. Students were considered to have gained more financial knowledge than the undergraduates. Also, most students have jobs, income, and experience in managing finances. Higher student knowledge is assumed to lead to better financial behavior and control to ensure stability without crucial problems. An individual with this financial management behavior makes a budget, saves money, and controls the financial situation.

This study examined the role of locus of control, financial attitude and knowledge, income, and spiritual intelligence in financial management behavior. Kholilah and Iramani (2011) stated that an individual with a better locus of control is wiser and more responsible in financial behavior. Moreover, an individual with sound financial knowledge manages and considers finances in decision-making (Ali, 2020). Hilgert and Hogarth (2003) related financial knowledge and income to credit and cash flow management, investment, and savings practices. Spiritual intelligence is needed in financial management because it fosters philanthropy.

Locus of control affects financial management behavior (Kholifah & Iramani, 2011; Dwiastanti, 2017; Jannat et al., 2021). In contrast, Shaikh et al. (2022) found that locus of control does not affect personal financial management behavior. Asih and Khafid (2020), Ameliawati and Setiyani (2018), Dewanty and Isbanah (2018), and Dwiastanti (2017) stated that financial attitude positively and significantly influences financial management behavior. However, Shaikh et al. (2022) showed that financial attitude does not affect financial management behavior.

The second factor affecting financial management behavior is financial knowledge. Asih and Khafid (2020), Perry and Morris (2005), and Winarta and Pamungkas (2021) found that subjective financial knowledge positively and significantly affects individual financial management behavior. The results contradict Herdjiono et al. (2016) and Jannat et al. (2021) that financial knowledge does not significantly impact financial management behavior. Therefore, the inconsistency in findings implies the need for further studies on this topic.

The third factor that influences financial management behavior is the level of income. Khan and Padda (2021) found that income affects financial management behavior. However, Herdjiono and Damanik (2016) stated that income does not affect financial

management behavior. Regarding the fourth factor, Dewanty and Isbanah (2018) found that spiritual intelligence positively affects financial management. This result means that higher spiritual intelligence leads to better financial management behavior.

The novelty in this study is the use of locus of control as an intervening variable and spiritual intelligence as a variable x in examining financial management behavior. The mediator is the locus of control, often involved in psychological studies. However, this study involved variables or factors influencing financial management behavior. The relationship of each variable was examined through locus of control. The independent variables involve financial attitude and knowledge, income, and spiritual intelligence, while the dependent variable is financial management behavior. Previous studies mainly examined the relationship between the independent and dependent variables. They also used income levels, inflation rates, and the various financial variables studied frequently. Therefore, this study included locus of control as a psychological factor, differentiating it from previous studies. Another difference was the study object, which comprised postgraduate schools in DKI Jakarta. The object consisted of postgraduate students considered to have full attention in financial management.

The topic in this article deserves to be global and international news because it can provide an overview of the financial management behavior of the Indonesian people, specifically postgraduate students in Indonesia. The description of the Indonesian version of financial behavior that specializes in postgraduate students will be used as a comparison later in similar research. The point is that researchers and academics worldwide with the same concentration in financial management behavior will make this reference later in assessing financial behavior in other countries. Later, this research will become a comprehensive study, with comparisons of financial behavior between countries and continents. Of course, it will add to the scientific treasures that are more interesting and complex. Besides that, the most important topic discussed in this research is a topic that is rarely done in finance. Most financial research tends to secondary data. Finance has begun to operate flexibly by involving primary data and other scientific elements, namely psychology.

The study aimed to examine and analyze the effect of financial attitude and knowledge, income, and spiritual intelligence on locus of control and financial management behavior. It also examined the influence of financial attitude, knowledge, income, and spiritual intelligence on financial management behavior through locus of control. Furthermore, the influence of locus of control on financial management behavior was analyzed.

METHODS

This study used a quantitative descriptive method to describe a symptom and event occurring at present (Ahmed et al., 2020; Chan, 2019). A quantitative descriptive method was carried out to test specific populations or samples. This study's population comprised 15,888 students in master's and doctoral degree programs at the state universities (PTN)

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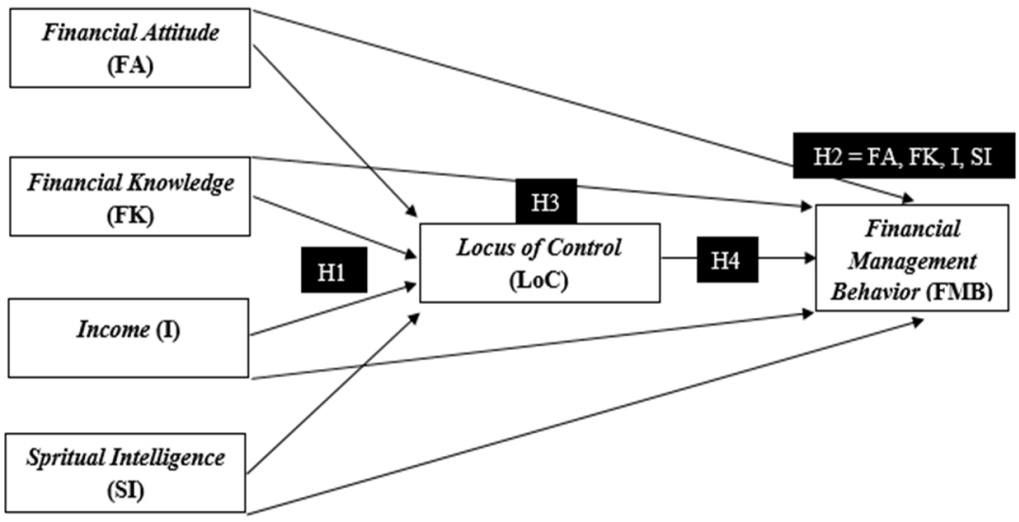
in Jakarta. The universities include Universitas Indonesia, Universitas Negeri Jakarta, UIN Syarif Hidayatullah Jakarta, and UPN Veteran Jakarta. The sample of postgraduate students was determined based on their economic stability. This situation was an interesting enough indicator of how students manage their finances (Amri et al., 2022).

Furthermore, postgraduate students were more mature with experience in financial problems (Amri et al., 2022). In addition, the selection of postgraduate respondents is also based on the level of education taken at a level that is more prepared to face global challenges, including economic problems, because they have had much experience with struggles up to college when at the previous level. Sample selection of postgraduate students was rarely studied, making it another novelty in this study. Therefore, the sample comprised 391 respondents determined with the sampling technique referring to the Slovin formula and the convenience sampling method. The sampling technique involved selecting respondents who fulfill the predetermined characteristics. The method was carried out by distributing questionnaires through social media networks. Students who filled out the questionnaires as required became the study respondents.

This study used primary data obtained by distributing questionnaires through Google Forms to a sample predetermined according to the criteria. All respondents filled out informed consent indicating their conscious willingness to participate. Furthermore, the data processing techniques were carried out in 4 stages: editing, coding, processing, and cleaning. The study framework is shown in Figure 1.

Figure 1. Study Framework



The study framework explains the relationship between the variables tested in the study so that it can be better understood through visual representations. Figure 1 shows that four hypotheses were proposed based on the existing problem formulation. Each hypothesis was marked with the symbol H. The direction of the arrow in the picture shows the direct effect of one variable on another.

The data were analyzed with the Structural Equation Model (SEM) and the AMOS version 26 program software. SEM combines the structural model approach and path and factor analyses (Amin et al., 2019). According to Tarumaraja et al. (2017), it combines statistical methods separated from the simultaneous equation and factor analysis. Comprehensively, this study's stages of the AMOS analysis method consisted of descriptive statistics and hypothesis testing. The analysis began by collecting data selected through the outlier test process. The data were entered into the AMOS program and processed according to the existing hypothesis. The results were presented based on a needs analysis of a predetermined hypothesis.

RESULT AND DISCUSSIONS

This study involved 391 respondents. Table 1 shows that 48.4% of students in master's and doctoral degree programs came from Universitas Indonesia, while 28.1% were from Universitas Negeri Jakarta. Furthermore, 66.5% of the respondents were 20-30 years old, 59.3% were female, and 40.7% were male. Female respondents dominated the most compared to men if looking at the data obtained. Regarding education, 56.5% and 43.5% were continuing their master's and doctoral degrees, respectively. Meanwhile, most of the respondents identified their marital status as single. Additionally, 20% of the respondents had varied income levels, with most working as lecturers, teachers, private employees, and entrepreneurs.

Table 1. Demographic Data

No.	Categories	Sub-Categories	Frequencies	Percentages (%)
1	Universities	Universitas Indonesia	191	48.8
		Universitas Negeri Jakarta	110	28.1
		UIN Syarif Hidayatullah Jakarta	75	19.2
		UPN Veteran Jakarta	15	3.8
2	Ages	20 years – 30 years	260	66.5
		31 years – 40 years	98	25.1
		41 and above	33	8.4
3	Gender	Male	159	40.7
		Female	232	59.3
4	Education	Diploma degree	221	56.5
		Master degree	170	43.5
5	Marital status	Married	170	43.5
		Single	221	56.5
6	Incomes	<Rp. 3,000,000	100	25.6
		IDR 3,000,000 - 5,000,000	116	29.7
		IDR. 5,000,000 - 10,000,000	103	26.3
		>IDR 10,000,000	72	18.4
7	Occupation	Lecturers	31	79
		Teachers	46	11.8
		Housewives	20	5.1
		Students & Freelancers	29	7.4
		BUMN employees	25	6.4
		Government employees	58	14.8
		Private employees	99	25.3
		Self-employed	83	21.2

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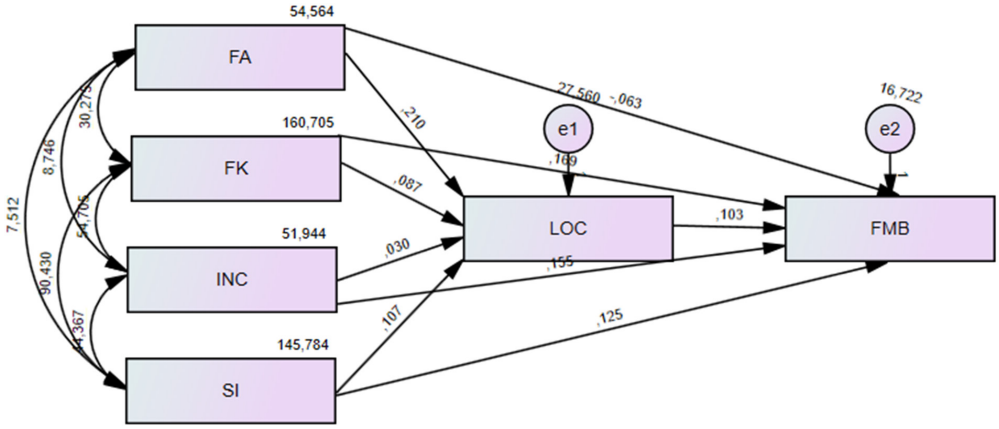
Figure 2. Full AMOS Model



The results showed that the six measuring instruments had met the fit criteria according to the existing parameters. The next step was the hypothesis test using SEM analysis based on the Full AMOS Model shown in Figure 2. The analysis results in Figure 2 show using a model modified by this study. The results of the modified version of the Amos analysis show effective results and consist of several data, including loading factors, errors, and the relationship's direction. The model is fit and can describe the results that cannot be interpreted in depth. The results of a more profound interpretation are shown in Table 2.

Table 2 indicates that financial attitude, knowledge, and spiritual intelligence positively affect locus of control. Meanwhile, income does not affect locus of control. For the second hypothesis (H2), financial knowledge, income, and spiritual intelligence positively and significantly affect financial management behavior. The effect of financial attitude on financial management behavior is negative. Furthermore, locus of control positively influences financial management behavior (H4). The third hypothesis (H3) test indicated an indirect effect from the analysis using Z-Sobel. The analysis included each independent variable's path coefficient value and standard error. The path coefficient and standard error scores were entered into the automatic calculation based on the Z-Sobel formula. The results in Table 3 were obtained from each effect of the independent on the dependent variable through the intervening variable.

Table 2. Regression Weights

Information	Estimate	S.E.	C.R.	P
LOC ← FA	.210	.038	5.467	***
LOC ← FK	.087	.030	2.858	.004
LOC ← INC	.030	.047	.628	.530
LOC ← SI	.107	.028	3.761	***
FMB ← FA	-.063	.031	-2.024	.043
FMB ← SI	.125	.023	5.540	***
FMB ← FK	.169	.024	7.104	***
FMB ← INC	.155	.037	4.182	***
FMB ← LOC	.103	.039	2.611	009

Note. S.E = Standard Error, C.R = Critical Ratio, (*** = significant)

The Z-Sobel results indicated that financial attitude and spiritual intelligence positively and significantly affect financial management behavior through locus of control. The score refers to the significance criteria presented by Preacher (2021) in Ramdani et al. (2022), that Z-Sobel ≥ 1.96 means the intervening variable in functioning. Furthermore, financial knowledge and income variables do not significantly affect financial management behavior through locus of control, contradicting the theory by Preacher (2021) in Ramdani et al. (2022).

Table 3. Z-Sobel Results of the Third Hypothesis (H3)

Indirect Influences	Z-Sobel
FA - LOC –FMB	2,38
FK - LOC – FMB	1,95
INCOME - LOC – FMB	0,62
SI - LOC – FMB	2,17

Source: Processed Data (2022)

Financial attitude positively affects the locus of control of students. A better financial attitude strengthens the locus of control in acting carefully. In this case, students with sound financial attitudes control themselves to spend money wisely for financial and economic benefits (Agustina & Mardiana, 2020; Asih & Khafid, 2020; Dwiastanti, 2017). From a psychological perspective, attitude is essential in directing a person to act and behave. This result becomes a positive signal, where a positive attitude towards an object improves other aspects (Veeck et al., 2020). Another study found that this attitude is closely related to financial literacy (Dewanty & Isbanah, 2018). Individuals with a good attitude have financial literacy, indirectly affecting their future financial behavior (Dewanty & Isbanah, 2018).

Financial knowledge positively affects the locus of control of students. This result is because managers with financial knowledge form a locus of control. After all, they consider the best decisions to solve financial problems. Students' ability to solve problems independently shapes their experience and prudence in managing finance. Previous studies showed that thorough knowledge forces people to manage expenses and matters caused by their financial condition (Blount et al., 2023; Lin & Bates, 2022). Therefore, financial knowledge influences a person's locus of control.

Income does not affect the locus of control of students. People with high and low incomes could both have good self-control. Therefore, there is no need to map one's self-control based on the income earned. This result contradicts previous studies on income predicts locus of control (Cruz-Cárdenas et al., 2019). However, it was assumed that income is in other less prioritized conditions regarding behavior. According to the demographic data in this study, many respondents were in a stable financial condition, which did not impact their financial management behavior. In line with this, previous studies found that income has an important role when an individual's financial condition is unstable (Ayupov & Kazakovtseva, 2014; Gohar et al., 2022).

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Spiritual intelligence positively affects the locus of control of students. This result shows that spiritual intelligence strengthens the relationship with locus of control. In this case, students with good spiritual intelligence and locus of control are more responsible for their actions. This responsibility promotes the emergence of spiritual intelligence to control one's life (Agustina & Mardiana, 2020; Asih & Khafid, 2020; Dwiastanti, 2017). The results are relevant to the current conditions, where many individuals face the Covid-19 pandemic. Consequently, people are forced to select more spiritual activities to support their work and life. Spirituality plays a role in ensuring one's behavior during the pandemic (Kim, 2021).

Financial attitude negatively and significantly influences the financial management behavior of students. This result showed that students with a high financial attitude exhibit poor financial management behavior. Many other factors affect attitudes, which cannot be independent of financial management behavior. Financial knowledge positively and significantly affects the financial management behavior of students. These results showed that students with poor knowledge of financial management make ineffective and unwise decisions regarding money to achieve success and prosperity.

Furthermore, income positively had an impacts on financial management behavior. This result means that reasonable and appropriate financial management behavior must be equipped with good income. With a good income in financial management, students can meet all their needs, including paying bills or debts. This condition hinders the ability to save and make investments that later ensure the achievement of financial prosperity (Asih & Khafid, 2020; Herdjiono et al., 2016).

Spiritual intelligence positively affects the financial management behavior of students. Spiritual intelligence could be manifested in various areas, including financial management behavior. Financial attitude positively and significantly impacts financial management behavior through locus of control. The individuals with better financial attitudes have a stronger locus of control in considering things. Locus of control is formed by feelings to support or not support a financial behavior, resulting in responsibility. Therefore, a higher financial attitude improves the locus of control to create sound financial management behavior (Asih & Khafid, 2020; Dwiastanti, 2017; Kholilah & Iramani, 2011).

Financial knowledge does not affect financial management behavior through locus of control. Students with good financial knowledge have no control over managing finances. The respondents in this study possibly had various demographic backgrounds, such as work, religion, and education. Therefore, students' financial knowledge did not affect the financial behavior mediated by locus of control.

Income does not significantly influence financial management behavior through students' locus of control. This condition occurs because students need more experience in financial management. Furthermore, this assumption is strengthened by the respondents involved, where 66.5% were 20-30 years old. Students have a bachelor's degree and are continuing their master's and doctoral degree programs. However, they may need better financial management because parents finance most or may not be fully responsible

for using the income earned. The results showed that spiritual intelligence positively and significantly affects financial management behavior through locus of control. This result means students with high spiritual intelligence control their needs and wants. Consequently, this shapes financial behavior according to the targets set.

Locus of control positively affects the financial management behavior of students. It means that reasonable and appropriate financial management behavior must be equipped with an exemplary locus of control. Therefore, students with a poor locus of control in financial management need help to control themselves to meet basic needs (Asih & Khafid, 2020; Dwiastanti, 2017; Kholilah & Iramani, 2011). Locus of control is essential to achieving financial success, which results from one's efforts. Therefore, good and appropriate financial management behavior must be accompanied by an exemplary locus of control. Students with poor self-control in financial management need help to control themselves to take advantage of the receipts received to meet basic needs. In contrast, good self-control enables students to allocate money according to the plan to achieve financial goals without significant obstacles. The results support the theory of planned behavior. According to this theory, behavior is controlled by the individual, resources, opportunities, and specific skills. This condition refers to the financial knowledge perceived to affect intentions and behavior. Locus of control is the intention that affects financial management behavior.

CONCLUSION

This study showed that locus of control effectively mediates the effect of financial attitude and spiritual intelligence on financial management behavior. It means that individuals with high financial attitudes and spiritual intelligence have a stronger locus of control and better financial management behavior. Meanwhile, locus of control cannot effectively mediate the effect of financial knowledge and income on financial management behavior.

The study subjects were limited to students in master's and doctoral degree programs at State Universities in Jakarta. Therefore, future studies could collaborate with Private Universities in Jakarta or other provinces. Students could also be separated into those continuing studies with and without scholarships based on gender and profession. In this study, many subjects found filling in the instruments with many items difficult. Therefore, future studies could use more and better instruments during the data collection. Various trials should be performed to ensure that the instruments are simple enough for the study subjects.

This study is expected to help students do better financial planning to train more responsible financial behavior and better locus of control. The public could also benefit from the information related to finance to prepare financial planning. This information is essential because Indonesia's financial management level still needs to be higher. Furthermore, related institutions and campuses could use the results to conduct routine activities related to sound financial management. This result implies the need for

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people to consider personal factors before making decisions to produce a better financial management scheme. These implications confirm that the research results significantly contribute to increasing the capacity of public knowledge about psychologically good financial management and will increase the theoretical complexity of the science of finance behavior.

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Customer Perceived Value in Ethnic Japanese Restaurants: Which Factors are Considered?

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Abstract
Ethnic restaurants are currently a fascinating topic, as they promote specific ethnic cultures and allow customers to try something new and different. Ethnic restaurants often offer flavors that are truly representative of a specific culture. This research investigates the factors influencing customer perceived value in Japanese ethnic restaurants. Data were collected through an online survey completed by customers who had visited a Japanese ethnic restaurant in Indonesia. The Structural Equation Model (SEM) was applied to test the hypotheses. The findings of this study demonstrate that food quality, employee service quality, and price fairness positively affect customers' perceived value. In contrast, the dining atmospheric quality and restaurant authenticity do not affect customers' perceived value. Studies on customer perceived value in ethnic Japanese restaurants are still scarce in the literature., especially in Indonesia and Malaysia. Thus, this study aims to fill that gap, providing valuable insights for future research and restaurant management.

Keywords:
customer perceived value; ethnic restaurant; food quality; service quality; restaurant authenticity

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INTRODUCTION

The increasingly competitive restaurant industry challenges players to meet consumer needs, wants, and demands (Souki et al., 2020). This condition is attributed to consumers being more knowledgeable, aware, demanding, and sophisticated while looking for restaurants that offer wholesome, natural, and fresh food (Tariq et al., 2019). Additionally, consumers seek a simple, cozy, fun, and safe food purchasing and consumption experience (Wang & Alexander, 2018). As a result, individuals visit restaurants for various reasons beyond mere sustenance, including seeking entertainment, alleviating boredom, exploring new experiences, finding comfort and convenience, saving time, connecting with others, or being in the company of family and friends (Avcikurt et al., 2016).

The overseas market presents a unique challenge due to cultural differences. Consumers from any local market greatly appreciate foreign corporations creating products that bridge cultures. Cross-cultural products can yield favorable outcomes for a company's success in foreign markets (Ariyanthi, 2022). In Indonesia and Malaysia, the restaurant industry demonstrates promising prospects. Most restaurant businesses' primary activities involve selling food and beverages. Companies must focus on customer expectations to ensure satisfaction to compete effectively, potentially incorporating services that define the restaurant experience (Severt et al., 2022). Entrepreneurs in the region offer various types of cuisine, including Japanese, which possess their characteristics or values to fulfill customer desires.

According to data from the Indonesian Statistics Centre (BPS), the percentage of Japanese cuisine restaurants has decreased yearly. In 2013, it reached 7.14%; the following year, it fell to 6.78%; in 2015 it was only 5.64%. Meanwhile, for other dishes (Thai, Middle East, and others), in 2013, the percentage was 5.77%. In 2014, it decreased to 5.06% and slightly increased to 5.34% the following year. This condition indicates that Japanese ethnic cuisine is reasonably popular and familiar among Indonesian people. Seeking authentic cultural experiences is one of the primary motivations for customers visiting ethnic restaurants (Liu & Mattila, 2015). A study explains that Japanese cuisine has become integral to Asian and global food (Jin et al., 2023). Japanese food has become one of the public's outdoor culinary destinations in Indonesia. Although the BPS data shows a declining trend in the percentage of Japanese restaurants in Indonesia, it remains relatively high compared to other cuisines (Thai, Middle East, and others).

The decline in the percentage of Japanese ethnic restaurants in Indonesia and Malaysia is most likely due to challenges competing within a highly competitive market. In recent decades, companies have been operating in a new and complex competitive environment where customers increasingly demand value creation (Sánchez-Fernández et al., 2009). This condition has led to a growing interest in creating and delivering customer value, with businesses focusing on customer-perceived value rather than solely generating profits (Liu et al., 2018). Therefore, it is pivotal for companies to compete by providing value to customers (Thielemann et al., 2018). In addressing these issues, this study proposes a model to ascertain significant factors influencing customer perceived value.

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As customers have different preferences, various consumer segments value the same services differently. Therefore, the main objective of the present study is to investigate and re-examine the factors that influence customer perceived value, especially in Japanese ethnic restaurants. In this study, we have identified several variables, including food quality, employee service quality, dining atmospheric quality, price fairness, and restaurant authenticity, which are known to significantly impact customer perceived value based on previous journal reviews. By examining these factors and researching their connections in the suggested model, we aim to enhance the understanding of the Indonesian food service. Therefore, this study bridges the gap regarding the factors considered in customers' perceived value, especially in Japanese ethnic restaurants.

While studies of customer perceived value have been rapidly developing, limited attention has been given to the perspective of Japanese ethnic restaurant consumers on perceived value. Therefore, this present study will contribute to a better understanding the literature on customer perceived value in Japanese ethnic restaurants, providing valuable insights for future research. Furthermore, the findings of this study will offer the restaurant industry, especially Japanese ethnic restaurants, a deeper understanding of the factors influencing customer perceived value. This knowledge will assist the industry in taking targeted actions to leverage the growing market and compete effectively.

Slack et al (2021) conducted a similar study with the independent variables of food quality, physical environment quality, and employee service quality, also known as fast-food restaurant service quality, influencing customer-perceived value. Konuk (2019) demonstrates that price fairness also predicts customer-perceived value. This study develops a new model with modifications from previous research, proposing five independent variables: food quality, employee service quality, dining ambiance quality, price fairness, and restaurant authenticity as factors evaluated in customers' perceived value. The methodology structures the presentation of this paper, and the data used in this study will be discussed in Section 2. The results and discussion of this research will be published in Section 3, and finally, Section 4 provides closing remarks.

METHODS

This study employed a quantitative approach, utilizing primary data through a survey distributed online questionnaires. A seven-point Likert-type scale was used to evaluate each construct in this study. Non-probability sampling, specifically purposive sampling, was utilized for sample selection. 17 Japanese restaurants have been certified as halal (chanelmuslim.com). However, only 7 Japanese restaurants have valid certification, including Marugame Udon. The participants in this study were individuals who had made at least one physical purchase. They participated in this study by filling out online questionnaires through Google Forms. The questionnaires were distributed via social media platforms such as WhatsApp and Instagram's story and direct message features during October 2022. A total of 519 samples were collected, whereby surveys with incorrect or partial responses were excluded from the analysis. Therefore, after the screening and

trimming process, the remaining data used in this study consisted of 400 samples, which satisfied the guidelines for determining sample sizes of more than 30 and less than 500 are appropriate for most studies (Sekaran & Bougie, 2016).

The Structural Equation Model (SEM) was employed to test the hypotheses through the AMOS 26 application program. Figure 1 shows the framework of this research. The convergent validity test was carried out using Confirmatory Factor Analysis (CFA), and the Reliability test employed the value of Construct Reliability (CR). All constructs used in this research were adjusted to meet the research environment and drawn from the most pertinent literature. The explanation of the variables from this research can be seen at Table 1.

Table 1. Constructs and item description

Variable/Source	Indicators	Operational Description
Customer perceived value (Liu et al., 2018)	- The service is good and according to my expectations (CPV1) - The food at delicious and meets my expectations (CPV2) - Overall, the dining experience was good according to my expectations (CPV3) - The restaurant offers good value according to my expectations (CPV4)	a consumer's overall evaluation of a product's usefulness based on their evaluations of what is given and received.
Food quality (Slack et al., 2021)	- The food taste is delicious (FQ1) - The food is hygienic (FQ2) - The food is fresh (FQ3) - The food is visually attractive (FQ4) - The food smell enticing (FQ5)	a mixture of factors that are used by customers to assess food quality
Employee service quality (Chen & Hu, 2010; Slack et al., 2021)	- Friendly employee - hospitality (ESQ1) - Speed of service (ESQ2) - Accuracy in fulfilling orders (ESQ3) - Employees willing to help (ESQ4)	the level to which restaurant employees show interpersonal courtesy to customers
Dining atmospheric quality (Slack et al., 2021)	- Have attractive interior design and décor - the ambiance (DAQ1) - Furnishing/facility in the restaurant is appropriate (DAQ2) - The restaurant has comfortable seating space (DAQ3) - The dining areas are thoroughly clean (DAQ4)	a space designed to create certain specific emotional effects in the minds of customers to increase their purchase probability
Price fairness (Konuk, 2019; Severt et al., 2022)	- The food is reasonably priced (PF1) - The price is acceptable (PF2) - The price seemed appropriate for what I received (PF3)	consumers' subjective feelings about prices as being right, fair, or legitimate versus wrong, unfair, or illegitimate
Restaurant authenticity (Liu et al., 2018)	- The taste of the food is authentically Japanese (RA1) - Name of the dishes as authentically Japanese (RA2) - The ambiance of the restaurant is authentically Japanese (RA3) - The appearance of the employees as authentically Japanese (RA4)	the quality of being genuine, real, or true, and reflecting the culture of the ethnicity it refers to

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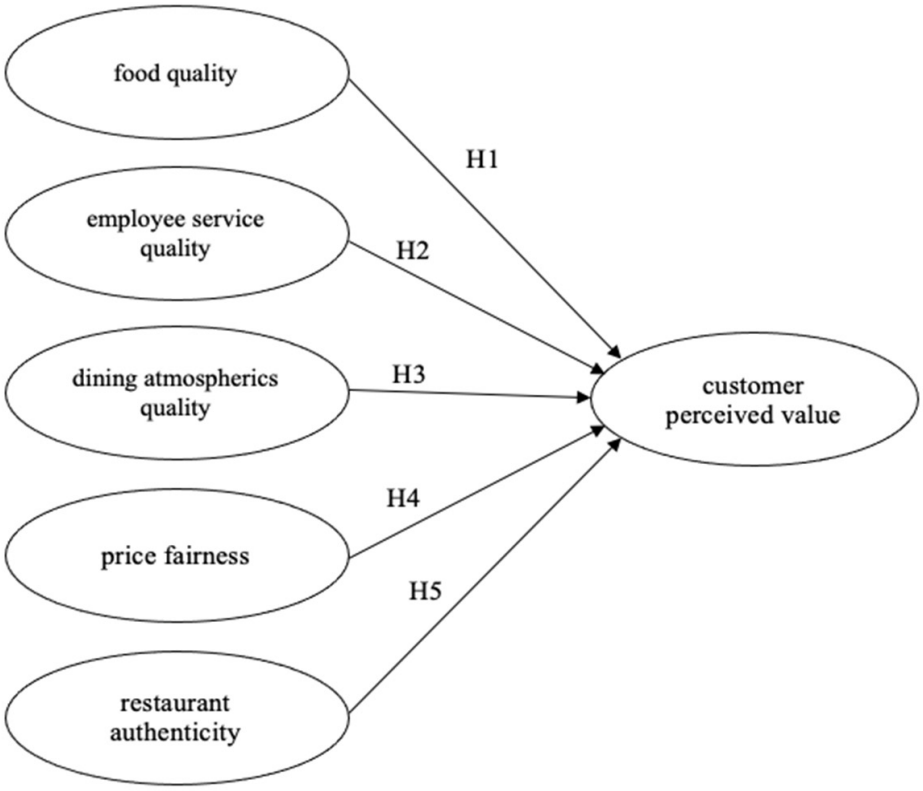
Figure 1. Research Framework



RESULT AND DISCUSSION

The descriptive data in Table 2 reveals that 77 male respondents (19.25%) and 323 female respondents (80.75%) participated in the study. Most respondents fell into the 20-24 age group, with 191 respondents (47.75%). In terms of educational background, a total of 223 respondents (55.75%) had a bachelor's degree. Most respondents identified as college students, with 206 respondents (51.5%). As for the monthly expenditure, most respondents spent ≤ Rp2.500.000, amounting to 256 respondents (64%). Regarding purchase frequency, most respondents made purchases 1 – 3 times, with 244 respondents (61%). Lastly, the majority of respondents frequently visited branches in West Java, with 94 respondents (23.5%).

The convergent validity test was carried out using Confirmatory Factor Analysis (CFA) with AMOS 26 and would be declared valid if the test results showed a significant ≥ 0.5 (Sekaran & Bougie, 2016). The results of the validity test are presented in Table 3. It could be observed that all statement items exhibit a factor loading value of more than 0.5, indicating that all indicators are valid.

Table 2. Profile of Respondents

	Category	Frequency	Percentage (%)
Gender	Male	77	19.25%
	Female	323	80.75%
Age	15 – 19	126	31.5%
	20 – 24	191	47.75%
	25 – 29	54	13.5%
	30 – 34	18	4.5%
	≥ 35	11	2.75%
Education	Elementary & Junior high school	6	1.5%
	High school/equivalent	119	29.75%
	D3/D4	45	11.25%
	Bachelor	223	55.75%
	Master/Magister	6	1.5%
	Doctor	1	0.25%
Occupation	Students	51	12.75%
	College Student	206	51.5%
	Teacher/Lecturer	7	1.75%
	Employee	76	19%
	Entrepreneur	25	6.25%
	Others	35	8.75%
Monthly Expenditure	≤ Rp2.500.000	256	64%
	> Rp2.500.000 – Rp5.000.000	102	25.5%
	> Rp5.000.000 – Rp7.500.000	26	6.5%
	> Rp7.500.000 – Rp10.000.000	7	1.75%
	> Rp10.000.000	9	2.25%
Purchase Frequency	1 – 3 times	244	61%
	4 – 6 times	64	16%
	> 6 times	92	23%
Frequently Visited Branches	Jakarta	69	17.25%
	West Java	94	23.5%
	East Java	36	9%
	Central Java	12	3%
	Banten	21	5.25%
	Yogyakarta	32	8%
	North Sumatra	39	9.75%
	Riau	31	7.75%
	South Sulawesi	25	6.25%
	Others	41	10.25%

The reliability test was conducted using the Construct Reliability value. According to Hair et al. (2011), if the Construction Reliability coefficient is more than > 0.70, then the result is considered reliable. This study tested the suitability of the structural equation model with three groups of fit measures, namely Absolut Fit Measures, Incremental Fit Measures, and Parsimonial Fit Measures. The absolute suitability criteria tested included

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Chi-Square, Normed Chi-Square (CMIN/DF), Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Root Mean Square Error of Approximation (RMSEA). Meanwhile, the incremental fit criteria tested in this study include the Tucker-Lewis Index (TLI) and the Comparative Fit Index (CFI). In contrast, the parsimony criterion tested in this research is Parsimonious Goodness of Fit (PGFI). Table 5 presents the results of testing the structural equation model, which shows the RMSEA 0.072, TLI 0.902, and CFI 0.916 meet the required cut-off value, as did the PGFI results. The AGFI value is 0.828, and the GFI is 0.864, which is included in the marginal fit category. Because there are three good criteria, this research has good results. Furthermore, the model modification was not carried out and continued with further analysis.

The research hypotheses were tested using the Structural Equation Model (SEM). The output of a regression weight test could be used to determine the results of hypothesis testing (Table 6). Regression weight is a test to determine the link between exogenous and endogenous variables. If the probability (p) value was less than 0.05 and the C.R. value was more significant than 2.000, the hypothesis in this study was accepted (Ghozali, 2017).

Table 3. The Result of the Validity Test

Variables	Indicators	Factor Loading	Model
Customer perceived value	CPV1	0,732	Valid
	CPV2	0,686	Valid
	CPV3	0,816	Valid
	CPV4	0,848	Valid
Food quality	FQ1	0,592	Valid
	FQ2	0,775	Valid
	FQ3	0,816	Valid
	FQ4	0,587	Valid
	FQ5	0,552	Valid
Employee service quality	ESQ1	0,784	Valid
	ESQ2	0,675	Valid
	ESQ3	0,726	Valid
	ESQ4	0,766	Valid
Dining atmospheric quality	DAQ1	0,777	Valid
	DAQ2	0,821	Valid
	DAQ3	0,738	Valid
	DAQ4	0,719	Valid
Price fairness	PF1	0,860	Valid
	PF2	0,935	Valid
	PF3	0,777	Valid
Restaurant authenticity	RA1	0,828	Valid
	RA2	0,859	Valid
	RA2	0,760	Valid
	RA3	0,718	Valid

The three hypotheses are statistically shown to be considerably affirmative, as indicated in Table 6. It can be observed that customer-perceived value is positively impacted by food quality, employee service quality, and price fairness. These findings support H1, H2, and H4. Meanwhile, the results for H3 and H5, which refer to restaurant authenticity and dining atmosphere quality, are insignificant. This result means that the quality of the restaurant's atmosphere and authenticity do not affect the customer's perceived value. In other words, the findings of this study show that H3 and H5 do not support the hypotheses.

Table 4. The Result of the Reliability Test

Variables	CR	Model
Food Quality	0,984816	Reliable
Employee Service Quality	0,933532	Reliable
Dining Atmospheric Quality	0,959975	Reliable
Price Fairness	0,87765	Reliable
Restaurant Authenticity	0,902072	Reliable
Customer Perceived Value	0,939812	Reliable

We can explain the empirical findings on the relationship between variables based on the results. Firstly, food quality has a positive effect on customers' perceived value. Food quality encompasses a mixture of factors (such as physical aspects, microbial composition and characteristics, nutritional value, processing and storage, and safety) that customers use to evaluate food quality, differentiate food products, and determine the level of acceptance. Besides, food quality only needs to be changed slightly to increase or decrease customer perceived value (Ryu et al., 2008). The quality of food provided by a restaurant is paramount in a customer's decision to choose one restaurant over another (Astuti & Hartono, 2023; Serhan & Serhan, 2019).

Table 5. Model Goodness-of-Fit

Criteria	Cutoff Value	Result	Evaluation
X^2Chi-Square	Expected to be small	724,706	Not Fit
Probability	≥ 0,05	0,000	Not Fit
RMSEA	≤ 0,08	0,072	Fit
AGFI	≥ 0,90	0,828	Marginal Fit
GFI	≥ 0,90	0,864	Marginal Fit
CMIN/DF	≤ 2,00	3,058	Not Fit
TLI	≥ 0,90	0,902	Fit
CFI	≥ 0,90	0,916	Fit
PGFI	> 0,5	0,683	Fit

This result suggests that customers prioritize the flavor of the food and are attentive to its preparation and ingredient awareness, particularly in Japanese restaurants. Besides, restaurants that exhibit good food quality, characterized by delicious taste, cleanliness, hygiene,

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freshness, visually appealing presentation, and enticing aroma, significantly enhance customers' perceived value. The findings of this study align with those of Slack et al. (2021), which found that food quality is a strong predictor of consumer perceived value and significantly influences that value in a favorable way. This research is also consistent with the studies of Ryu et al. (2008) and Truong et al. (2017), which highlight the importance of food quality in shaping customer's perception of value, as well as Shah et al. (2021) which emphasize that better food quality plays a significant role in increasing customers' perceived value. These findings provide valuable insights for restaurant managers, enabling them to comprehend how perceptions of food quality contribute to customer-perceived value.

Secondly, employee service quality is found to have a positive effect on customers' perceived value. The findings of this study are relevant to previous research from Slack et al. (2021) and Truong et al. (2017), who state that employee service quality is a major determinant of customer perceived value, and it has a significant positive impact on that value. Service quality is the comparison of customers' expectations of the service offered and their perception of the service received (Yarimoglu, 2014). Employee service quality (in the restaurant industry) is defined as the level of interpersonal service restaurant employees provide when interacting with customers (Ha & Jang, 2010). Customers assess the interpersonal service interaction with restaurant employees and form their perceptions of a restaurant's employee service quality. Restaurants with good employee service quality, as indicated by friendly employees (hospitality), speed of service, accuracy in fulfilling orders, and employees willing to help will significantly increase customers' perceived value. This result means that customers are concerned about employee service quality as they visit a restaurant to enjoy the food with pleasant company while experiencing excellent service (Slack et al., 2021). As customers in Japanese restaurants tend to notice employee behavior and are sensitive about how well the employee treats them, service quality provided by restaurant employees is considered essential to increasing customer perceived value.

Table 6. The result of the Regression Weight Test

Relationship				Estimate	S.E.	C.R.	P	Description
H1	Customer perceived value	←	Food quality	0,563	0,153	3,677	***	Significant
H2	Customer perceived value	←	Employee service quality	0,545	0,115	4,761	***	Significant
H3	Customer perceived value	←	Dining atmospheric quality	-0,105	0,098	-1,066	0,286	Not Significant
H4	Customer perceived value	←	Price fairness	0,075	0,032	2,348	0,019	Significant
H5	Customer perceived value	←	Restaurant authenticity	-0,098	0,076	-1,285	0,199	Not Significant

Moreover, managers should consider strengthening both their employees' technical and social skills, given that they contribute considerably to the value of the firms (Truong et al., 2017). Social skills are the ability of an employee to interact with consumers in a good, friendly, and respectful way. On the other hand, technical skills refer to an employee's capacity to provide clients with rapid, responsive, and dynamic service that fulfilled their service order accurately and as they had expected. Controlling and enhancing this component of employee quality should concern restaurant management. Therefore, businesses must invest in employee training and development to ensure their employees provide high-quality service. Doing so can enhance the customer's perception of the value received from the business.

Thirdly, dining atmospheric quality did not have a positive significant influence on customer's perceived value. Elmashhara and Soares (2020) emphasize in particular that the atmosphere of the place is, in some cases, more influential than the product itself. By establishing a customer dining experience in a pleasant and comfortable atmosphere, customer-perceived value and competitive advantage can be developed. A previous study by Jalilvand et al. (2017) found that the dining atmospheric quality is also a significant predictor of and positively influences customer perceived value. However, in this study, the result of the analysis showed that dining atmospheric quality did not have a significant influence on customers' perceived value. This result means that customers are not concerned about the dining atmosphere quality in Japanese restaurants. This condition indicates that customers in Japanese restaurants might be concerned about another aspect of the restaurant rather than the dining atmosphere quality itself because many customers can be drawn to Japanese restaurants more for their excellent taste food and affordability than for the ambiance. Japanese restaurants with good dining atmospheric quality, characterized by attractive interior design and décor (the ambiance), furnishing/facilities in the restaurant are appropriate, the restaurant has comfortable seating space, and the thoroughly clean dining areas will not necessarily increase their customer-perceived value. The findings of this study are supported by the study from Ryu et al. (2012), which stated that an aesthetically pleasing environment was not shown to be a significant factor of consumer perceived value. These results are at odds with the majority of earlier studies, including Jalilvand et al. (2017), Liu and Tse (2018), Slack et al. (2021), and Weinstein (2020), who state that dining atmospheric quality has a positive significant influence on customer perceived value.

Fourthly, price fairness has a positive effect on customers' perceived value. Price fairness is conceptualized as the consumer's judgment and emotion regarding whether the difference (or lack thereof) between the seller's price and the other party's comparative price is reasonable, acceptable, or justified. Consumers generally compare a product's utility and price to infer a perceived value. From the same perspective, Itani, Kassar, and Loureiro (2019) argue that when a product's price is not acceptable, this results in lower consumers' perceived value. In contrast, customers' reasonable, acceptable, and fair menu price perceptions may enhance their value perceptions (Konuk, 2019). Relevant to the results of the present study, past empirical research

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findings also imply that price fairness affects customer perceived value (Ferreira et al., 2010). This result means customers are most concerned about price fairness in Japanese restaurants**.** This condition demonstrates that customers tend to notice what they paid for and are concerned about whether the price is appropriate for what they receive. Restaurants with good price fairness are characterized by reasonably priced food price, which is acceptable, and the price appropriate for what the customer receives will increase their perceived value.

Furthermore, the findings of this study also support research by Konuk (2019), who claims that price fairness significantly influences customer perceptions of value. This result implies that customers perceive value as higher when they believe the price is reasonable, fair, and acceptable. The significance of price fairness in raising customer perceived value suggests that business profit projections should not merely decide pricing levels. Setting menu prices should also consider how customers perceive the price of the dish. The prices on the food menus should be compared to those offered by other restaurants to determine the menu pricing in this situation. As a result, similar pricing levels may improve consumer price fairness perceptions of the price menus at the restaurant, and then the customer perceived value of the Japanese ethnic restaurant will ultimately increase.

Fifthly, restaurant authenticity is found not to have a positive significant influence on customers' perceived value. Authenticity is often seen as a restaurant offering to gain more excellent value (Kovács et al., 2014). One of the main reasons people eat at ethnic restaurants is to seek out unusual and authentic cultural experiences (Liu & Mattila, 2015). According to Wang and Mattila (2015), a restaurant is considered authentic if the food and the eating experience represent the ethnicity. Something recognized as authentic tends to be more valuable than something categorized as not authentic. In addition, previous empirical studies have supported a positive relationship between the authenticity of ethnic restaurants and customers' perceived value (Jang et al., 2012). As a result, restaurants often use the concept of authenticity as a unique selling point (Lu et al., 2015), and whether the food and dining environment reflect the culture of ethnic origin has become an essential attribute for evaluating ethnic restaurants (Liu & Jang, 2009).

However, in this study, restaurant authenticity does not significantly impact customer perceived value. This result means that customers are not concerned about the authenticity of Japanese restaurants. Customers might be concerned about another aspect of the restaurant rather than the authenticity aspect. Many customers might need to be more familiar with Japanese restaurants' original/authentic aspects so they cannot judge authenticity aspects. Individuals' cultural knowledge, social context, experience, and other's opinions may all influence authenticity judgments, and thus, authenticity perceptions of the same restaurant may differ among customers (Liu & Mattila, 2015; Youn & Kim, 2017).

Moreover, restaurants with good authenticity aspects, which are marked by the taste of the food as authentically Japanese, the name of the dishes as authentically Japanese,

the ambiance of the restaurant as authentically Japanese, and the appearances of the employees as authentically Japanese, will not necessarily have significant roles in increasing customers' perceived value. The findings of this study do not support the research of Jang et al. (2012) and Liu et al. (2018), who revealed a positive connection between the authenticity of ethnic restaurants and the perceived value of customers. However, Wang and Mattila (2015) hypothesized that for customers outside of the ethnic group, authenticity will only be valued when people are generally familiar with ethnic eating or are willing to engage with a foreign culture.

Some people are unconcerned about ethnic restaurant authenticity because they are unfamiliar with ethnicity and cultural differences, regardless of whether they eat the food regularly, or because they have no interest in exploring ethnicity and cultural differences and only see ethnic restaurants as another dining option (Liu et al., 2018). As a result, ethnic restaurant managers and owners should more effectively structure their businesses and attempt to segment their target customers according to cultural motivation and familiarity. Restaurants may emphasize authenticity for consumers with high levels of cultural attraction and familiarity through theming, atmospherics, and storytelling employing ethnic culture and restaurant history. Restaurants should focus on utilitarian characteristics such as food quality, employee service quality, price fairness, and location convenience for clients with limited cultural interest and lack of cultural familiarity. It will help a Japanese ethnic restaurant attract both types of customers if they implement both of those.

CONCLUSION

This study aims to identify the factors most influential in driving customer perceived value. In the restaurant industry, owners or managers must consider many factors to enhance customer perceived value, which can significantly benefit their business. This study, hence, contributes to understanding the factors that influence customer perceived value, particularly in ethnic Japanese restaurants. One significant finding is that the food quality of a restaurant has a positive effect on customer perceived value. This research proves that perceived food quality is essential in shaping customer perceived value. In other words, customers place great importance on food quality when choosing an ethnic restaurant. The results also show that employee service quality positively affects customer perceived value. The findings of this study also indicate that employee service quality positively influences customer perceived value. Hence, this study highlights the importance of restaurant businesses prioritizing employee training and development to ensure high-quality service. In addition, this study also discovered that price fairness can positively influence customers' perceived value. Therefore, in setting the price of the menu served at an ethnic restaurant, it is essential to consider how the customers perceive the pricing. Comparing prices with those offered by other restaurants can contribute to customers perceiving the prices as fair. Subsequently, it will enhance the perceived value of an ethnic Japanese restaurant.

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In contrast to previous studies, this study discovers that the quality of the dining atmosphere and the restaurant's authenticity do not significantly affect the customer's perceived value. In other words, these findings suggest that the two variables are not considered critical factors in customer perceived value. Therefore, the ethnic restaurant industry should pay more attention to the aspects of food quality, employee service quality, and price fairness to significantly increase the perceived value of their customers and compete in the competitive restaurant industry market. Theoretical and practical implications suggest that, when considering customer perceived value, attention should be given to food quality, employee service quality, and price fairness. Thus, future studies may explore other factors, such as restaurant service characteristics, extended service times, and special pricing for specific periods/seasons in customer perceived value. As value is pivotal for a product, it would be beneficial to test the model offered in this study on other ethnic restaurants so that the results can be further generalized.

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Challenges in Embracing Green Supply Chain in Morocco's Auto Industry

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Abstract
As global environmental awareness grows, businesses are increasingly pressured to integrate environmentally responsible practices into their supply chains. However, the automotive industry in Morocco needs to be faster to embrace Green Supply Chain Management (GSCM). This research applies the rigorous Analytic Hierarchy Process (AHP) approach and polls industry specialists to evaluate and prioritize the most significant barriers to broad GSCM deployment in the automobile industry. The results show that financial hurdles are the most difficult to overcome, whereas technical and infrastructure hurdles are less than others. This ground-breaking study provides important insights into the barriers to GSCM implementation in Morocco's automotive industry. These results could motivate governments, business leaders, and academics to create concrete plans to address the challenges highlighted here. The primary goal of this study is to promote environmental stewardship and drive corporate growth in Morocco's automotive sector by adopting of green supply chain techniques.

Keywords:
green supply chain management; barriers analysis; analytic hierarchy process; automotive industry

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INTRODUCTION

The concept of Green Supply Chain Management (GSCM) traces back to the late 1980s when companies began incorporating environmental considerations into their operations in response to the quality and supply chain revolutions. Discussions on the green supply chain can be attributed to Kelle and Silver's study in the 1960s, which introduced an optimal forecasting system for reusable products (Fortes, 2009). Over time, GSCM has evolved to encompass various dimensions such as green design, life-cycle analysis, reverse logistics, waste management, and green manufacturing. These developments have contributed to a more comprehensive understanding of GSCM's potential in driving sustainable practices throughout the supply chain.

Empirical evidence strongly supports the positive impact of GSCM implementation on automotive supply chain performance. The automotive companies in Portugal demonstrate the favorable influence of GSCM on supply chain performance (Carvalho et al., 2010). Similarly, research on Volvo, Trans Alta, and Nortel suggests that adopting GSCM practices can balance economic growth and environmental preservation (Rowledge et al., 2017). Furthermore, studies examining the economic implications of GSCM adoption highlight significant benefits (Rao & Holt, 2005). For instance, a study on manufacturing companies in the UAE reveals that green purchasing enhances economic performance through reduced energy and material consumption and increased average profit and sales returns (Younis et al., 2016). Consequently, green purchasing is considered a strategic approach to bolster economic vitality. Companies are faced with several obstacles in their pursuit of environmentally responsible practices despite the number of reasons pushing them to adopt Green Supply Chain Management (GSCM) and advance corporate sustainability. It is clear that GSCM implementation is a challenging task (Giunipero et al., 2012).

In the automotive industry, a vanguard of visionary automakers has emerged as trailblazers, leading the charge in Green Supply Chain Management (GSCM) and redefining the industry's future. With a proactive mindset, these companies embrace green design, sustainable purchasing, eco-friendly marketing, efficient production, eco-conscious packaging, and recycling practices. Remarkably, their commitment to sustainability goes beyond profit; it is a collective responsibility. Moreover, Moroccan automobile manufacturers, echoing this environmental consciousness, have integrated greening strategies, with Renault standing out for its remarkable CO2 emissions reduction through energy optimization and renewable energy utilization, alongside eliminating liquid industrial waste and reducing water charges (Haddach et al., 2017). These pioneers set a powerful precedent, underscoring that profitability and environmental stewardship can harmoniously drive the automotive industry toward a cleaner, greener, and more sustainable tomorrow.

However, challenges persist for other automakers, particularly in India, where limited customer demand, lack of knowledge, and concerns about additional costs hinder full GSCM implementation. Nonetheless, empirical evidence and case studies demonstrate the potential benefits of GSCM adoption, encouraging organizations to consider sustainable practices for both environmental preservation and economic growth. As a result of increasing public awareness as well as the efforts of key manufacturers, the automotive industry's future may be more promising than was once anticipated.

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Various countries have various environmental laws and regulations, which has led to disagreements about what is preventing Green Supply Chain Management (GSCM) from being implemented in the automotive industry. Others have yet to implement GSCM for various reasons, including low customer demand, a lack of expertise, and the perception that GSCM is an unnecessary expense. One must have an in-depth understanding of the potential barriers that may arise to successfully implement Green Supply Chain Management (GSCM) in the automotive industry. Numerous studies have been conducted, and their findings have shed light on modern enterprises' challenges.

Dashore & Sohani (2013) combed through the available literature and met with industry professionals to compile a list of twenty distinct obstacles to GSCM. Mohammadjafari et al. (2014) identified around twenty sub-barriers, which they divided into the categories of technology and funding. Zhu et al. (2007) highlighted regulatory compliance as a significant barrier, particularly in light of China's entry into the World Trade Organization. Several studies have shed light on the specific barriers in the Indian context. Luthra et al. (2011) identified 11 barriers and established contextual relationships using the Interpretive Structural Modeling (ISM) approach. Similarly, Mathiyazhagan et al. (2013) examined 26 barriers and assessed their impact on GSCM implementation in the Indian automobile industry, using ISM to determine the most significant barriers.

In the Indian mining industry, Muduli & Barve (2013) revealed that poor legislation and lack of environmental awareness were critical obstacles to GSCM adoption. Focusing on the viewpoint of a first-tier supplier, Silva et al. (2018) examine the challenges facing the Brazilian automobile sector in its efforts to adopt Green Supply Chain Management (GSCM). It classifies 43 GSCM roadblocks, verifies 13 of them with the help of experts, and evaluates their effect on different parts of the business using the Analytic Hierarchy Process (AHP). The cost implications barrier (B1) stands out as the most significant, with a weight of 22 times that of the thirteenth-ranked barrier (B21). Due to the interdependence of the companies involved in a supply chain, it is possible to eradicate some impediments to Green Supply Chain Management (GSCM) at a time. Therefore, supply chain members often need to establish priorities for overcoming these obstacles and work to do so in a way that considers their relative significance and urgency (Govindan et al., 2014).

This study is a first of its kind since it examines the obstacles to Green Supply Chain Management (GSCM) in the automotive sector, specifically in Morocco, where such research is still in its infancy. This study intends to shed light on the unique challenges encountered by the Moroccan automobile industry in adopting GSCM since the factors preventing its widespread adoption vary widely depending on the country and sector. The main goal is identifying and prioritizing these obstacles, offering crucial information for supply chain managers to target and overcome the most obstructive difficulties proactively. While other studies have looked at GSCM roadblocks, this one stands out by focusing on an understudied environment and industry to uncover novel difficulties and provide specialized solutions that can help supply chain managers push sustainable practices forward. The study aims to help the Moroccan automobile industry switch to more green practices as soon as possible by identifying and removing the most pressing impediments.

METHODS

Analytic Hierarchy Process (AHP) is a collection of axioms that closely determine the aspects of the environmental problem (Saaty, 1986). It is a decision-support tool in business industries. It is a methodology that compares alternatives concerning a criterion in a natural, pair-wise mode. AHP is based on a well-defined mathematical structure of consistent matrices and their associated right Eigen vector's ability to generate true or approximate weights (Kumar et al., 2009). The major objective is to determine what stood in the way of the widespread implementation of Green Supply Chain Management (GSCM) in the Moroccan automotive industry. We chose AHP because it has been suggested as a helpful method by previous GSCM researchers for understanding the driving forces and constraints underlying GSCM adoption.

Table 1. Barriers and sub-barriers analyzed by using AHP.

Barrier category	Specific barriers
Financial (F)	Deficiency of finances (F1) The unavailability of bank loans (F2) Costs of GSCM implementation (F3) Costs of hazardous waste disposal (F4) High investment and less return on investment(F5)
Organizational and operational (O)	Lack of commitment from Top, middle management and individual (O1) Bad company's culture (O2) Lack of company efforts to adopt the Rs practices such as reuse, recycle etc. (O3) Lack of ethical value and corporate social responsibility (O4) Lack of government initiatives and supportive policies (O5) The suppliers' refusal to adapt to green concepts (O6)
Technological and infrastructure (TI)	Non-adoption of advanced cleaner technologies (TI1) Complexity in recovery operations (TI2) Lack of research and development (TI3)
Knowledge and support barriers (KS)	Customers' unawareness of GSCM practices (KS1) Lack of knowledge and experiences on environmental impact and green practices (KS2) Lack of environmentally conscious human resources and skilled in GSCM practices (KS3) Lack of staff training about GSCM (KS4) Lack of support from supply chain players (KS5)

This research into the GSCM literature led us to discover as many as nineteen sub-barriers that together impeded GSCM's widespread adoption. To better understand these obstacles, we broke them down into the four categories shown in Table 1. As part of our study, we surveyed Moroccan automotive experts and professionals with knowledge of GSCM deployment. To ensure that the pair-wise comparison questionnaire, a crucial aspect of the AHP process, would provide valuable insights, we made a great effort in selecting the respondents.

We chose AHP for our analyses because of the following reasons. First, AHP is well-suited, because of its widespread reputation for simplicity and ease of application. We kept the matrix acceptable in size and minimized the possibility of inconsistency by

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restricting the number of sub-barriers to 19. In addition, the Analytic Hierarchy Process (AHP)'s capacity to build a hierarchical framework for analyzing choice criteria makes it a good fit for our research aims. This research focused our efforts where they would have the most payoff, efficiently prioritizing the many difficulties inherent in GSCM. Although we randomly polled 52 experts in the Moroccan automotive sector, we only received usable responses from 14. Notably, AHP is more of a decision-making tool than a statistical one. Therefore, its effectiveness in practice is not dependent on big sample sizes.

Figure 1. AHP Framework for Identifying Key Barriers of GSCM Implementation

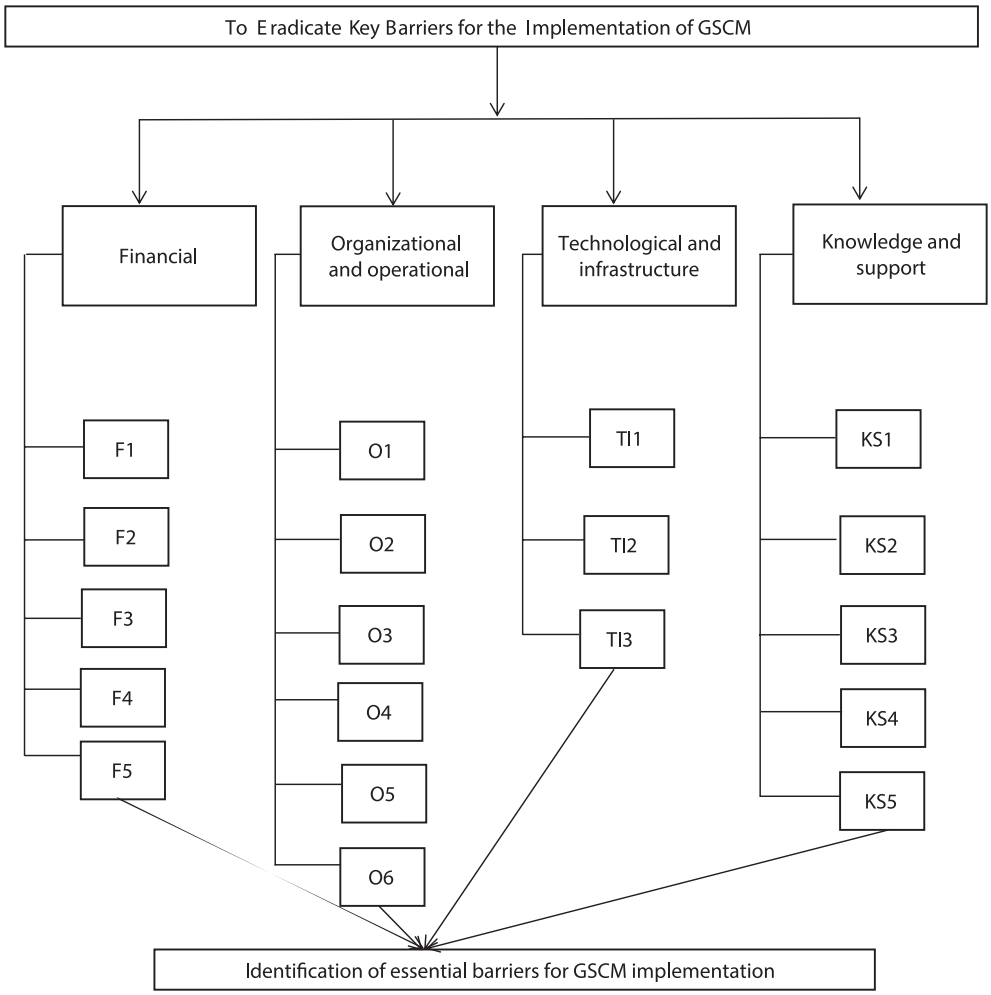

Figure 1 depicts the hierarchical prioritizing model we developed to achieve our study objective of identifying and removing critical impediments to the widespread adoption of GSCM. The literature evaluation yielded a four-tiered framework, with the top level representing the research objective, the next level representing the barrier categories, and the bottom level representing the specific barriers within each category. We developed a five-part, pair-wise comparison questionnaire to help us assess the significance of each obstacle and give them the attention they deserve. The questionnaire made it easy to compare broad categories of obstacles to specific obstacles within each category.

After collecting and analyzing filled-out surveys, the AHP approach is used to determine the standardizing weight for each category and individual barrier. In conclusion, we gained insight into the obstacles blocking the widespread implementation of GSCM in Morocco's automotive industry with the participation of expert respondents.

RESULT AND DISCUSSIONS

Table 2 shows the findings of an AHP study of the challenges associated with implementing green supply chain management (GSCM) in the Moroccan automotive sector. Several types of obstacles, including those related to Financial, Organizational and Operational, Technological and Infrastructure, and Knowledge and Support, are cataloged in the research. Global weights are then determined, considering both the relative relevance of each barrier within its category and the overall significance of all barriers. The financial barrier has the highest weight (0.38244). Among the four barrier categories, it is the most significant impediment to GSCM adoption in the Moroccan automotive sector. The second highest weight is given to the knowledge and support barrier category, indicating that it also considerably influences GSCM adoption. Organizational and operational barriers are ranked third, whereas technological and infrastructural barriers obtained the lowest weights (0.1054).

Among the barriers, the Costs of the GSCM implementation barrier (F3) have the highest global weight, followed by the lack of support from supply chain players (KS5). The high investment and lower return on investment (F5) has obtained the third-highest global weight. Moreover, the fourth-highest global weight went to the suppliers' refusal to adapt to green concepts (O6). At the same time, the bad company's culture (O2) is the less impactful barrier to the GSCM implementation. Financial barriers are a significant and continuous element slowing the automotive industry in Morocco's shift from conventional to GSCM. The most prominent challenge to implementing GSCM is a need for more financial resources. Financial barriers as significant restraints to GSCM implementation (Lee, 2008: Khan & Qianli, 2017). Lee (2008) pointed out that the costs of implementing GSCM might be a significant barrier for organizations looking to embrace green practices.

The findings are intriguing since they oppose the argument by Besbes et al. (2013), who posited that large enterprises may not face significant financial hurdles. On the other hand, this research shows financial barriers to implementing GSCM techniques at even the largest automotive companies in Morocco. The biggest financial obstacle found in this research is the costs of GSCM implementation (F3), which entail extra expenditures that are at odds with the financial objectives of these businesses. Moreover, the expensive investment and low return on investment (F5) are significant impediments, and the financial (F1) deficiency prevents substantial investment in GSCM processes. The unavailability of bank loans (F2) exacerbates the financial constraints, as Moroccan banks do not offer specific loans for green initiatives. These results highlight the critical importance of overcoming financial barriers to promote broader and more fruitful adoption of GSCM techniques.

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Table 2. Local and Global Weights of All Barrier Categories and Specific Barriers for the Implementation of GSCM

Barrier category	Relative weights using AHP	Barriers	Relative weights using AHP	Global weights using AHP	Rank
Financial	0,38244	F1	0,17454	0,06675	5
		F2	0,10984	0,04201	13
		F3	0,41884	0,16018	1
		F4	0,05704	0,02182	16
		F5	0,23974	0,09169	3
Organizational and operational	0,23469	O1	0,19684	0,04620	8
		O2	0,04898	0,01149	19
		O3	0,18304	0,04296	12
		O4	0,06512	0,01528	17
		O5	0,19672	0,04617	9
		O6	0,30930	0,07259	4
Technological and infrastructure	0,10541	TI1	0,41357	0,04359	11
		TI2	0,13800	0,01455	18
		TI3	0,44843	0,04727	7
Knowledge and support	0,27745	KS1	0,11882	0,03297	15
		KS2	0,21054	0,05841	6
		KS3	0,14277	0,03961	14
		KS4	0,16489	0,04575	10
		KS5	0,36298	0,10071	2

The second-highest impact barrier is knowledge and support. This result agrees with Abdullah et al. (2016), who similarly argue that lack of information and assistance hinders GSCM implementation. According to Abdullah et al. (2016), adopting green practices with sufficient understanding and support from stakeholders is only possible. According to the results, the biggest problem in this area is the need for more support from supply chain players (KS5). The success of GSCM depends on the combined efforts of everyone involved in the supply chain. The assessed businesses ran into this problem because they could not convince their stakeholders of the importance of environmental impact and green practices (KS2). The lack of staff training about GSCM (KS4) is also cited as a significant barrier. The only way to overcome these roadblocks is to provide workers with training and guidance in environmentally friendly methods.

However, it seems contradictory that customers' unawareness of GSCM practices (KS1) was given the lowest priority. Companies may be motivated to adopt green practices apart from client demand to improve their brand image, meet future regulatory obligations, or follow global sustainability trends. This research indicates that automotive manufacturers in Morocco are becoming more environmentally responsible, even without direct market pressure. The organizational and operational obstacles are next on the list of GSCM implementation barriers. The most critical challenge in this group is the supplier's refusal to adapt to green concepts (O6). Since the automotive industry needs parts from suppliers, it might be challenging to implement GSCM if those companies are hesitant to provide environmentally friendly materials. Successful GSCM deployment and reducing environmental effects need strong supplier collaboration. The second most important is the

need for more commitment from the top, middle management, and individuals (O1). Jayant & Azhar (2014) point out the importance of top and middle management in shaping a company's approach to environmental management. These results stress the need for full buy-in and dedication from top management before GSCM can be successfully implemented. When businesses adhere to sustainability principles, they better allocate resources, integrate environmental initiatives, and become more resilient in adversity.

The lack of government initiatives and supportive policies (O5) is another critical obstacle to GSCM implementation. This study corroborates the results of prior research suggesting that excellent government policy may encourage environmentally friendly practices in the private sector. Despite companies' best intentions, RS practices like reuse, recycling, etc. (O3) are not being implemented, indicating that more work must be done to encourage mainstream green practice adoption. Lastly, obstacles such as lack of ethical principles and CSR (O4) and a poor company culture (O2) are underlined. These challenges underscore the need for a business culture and values aligned with sustainability principles to promote successful GSCM implementation. When considering the challenges posed by technology and infrastructure, the absence of R&D (TI3) is often cited as the primary cause of concern. Education and research on GSCM could be much better in Morocco, which impedes progress in this area. To successfully apply GSCM processes, businesses need access to cutting-edge research and tools. Garcia-Torres et al. (2019) also highlighted the significance of R&D in the spread of green practices, which is consistent with these results.

The second most common challenge to GSCM implementation is the non-adoption of advanced cleaner technologies (TI1). Consistent with findings by Alonso-Muñoz et al. (2022), this finding highlights the role of technical innovation in enabling sustainable operations. Since the Complexity in recovery operations (TI2) is the least apparent technical barrier, it may not be as significant of a challenge to the adoption of GSCM. Even though this research suggests reduced Complexity in recovery operations, businesses still need to look for ways to simplify and enhance their waste recovery procedures to get the best possible environmental outcomes.

CONCLUSION

This study accomplished its primary goals, concentrating on identifying and comprehending the many obstacles Moroccan automotive firms confront in implementing green supply chain management (GSCM). The problems separated them into four groups: monetary, institutional, technical, and informational. Our detailed analysis of the hurdles within each category has helped the Moroccan automobile sector get a deeper and more nuanced understanding of the challenges it confronts in adopting sustainable supply chain practices. These results provide a solid foundation for future efforts, equipping stakeholders with the insights needed to devise concrete measures to remove these impediments.

Governments should take decisive action to overcome the most significant obstacles. Such action might include setting aside funds for environmentally friendly operations or teaming with banks to set up loans expressly for GSCM projects. As a method of amplifying the effects of GSCM adoption, it highlights the potential advantages of international cooperation with other countries and green-focused organizations. We stress the need

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for information sharing and capacity development beyond only policy. Increased training opportunities and easier access to conferences and summits are two ways authorities may better equip industry stakeholders with a thorough grasp of GSCM plans.

Finally, our findings show that increasing management's trust in GSCM's financial benefits for automotive companies is critical. This assurance is vital for resolving the recognized problems without risking the company's bottom line. Barrier elimination and supply chain resilience evaluation should be at the forefront of these efforts. Implementing GSCM requires careful forethought, setting short-term and long-term objectives, and a relentless review cycle. Financial pressures may be reduced, and a sustainable culture can be fostered by fostering cooperation and cost-sharing agreements among all partners in the supply chain. Building solid relationships with supply chain participants, governmental authorities, and shareholders is essential to securing access to vital resources, information, and greener technologies.

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Impact of Raw Material Export Restrictions on Employment: Evidence from Panel Data

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Abstract
The extractive industry typically contributes limited direct employment in host countries, prompting some nations to consider export restrictions on raw materials to enhance domestic job opportunities. However, scholarly opinions on the efficacy of these policies vary widely. This study addresses this gap by utilizing an extensive dataset spanning over a decade and encompassing diverse countries. Employing a fixed-effect Ordinary Least Square (OLS) regression model with panel data from 74 countries from 2009 to 2021, this paper shows that raw material export restrictions do not affect employment rates. This fact challenges the prevailing notion that export restrictions inherently boost domestic employment. Consequently, a more comprehensive strategy, including economic diversification, technological investment, and alternative job creation measures alongside export controls, is essential to effectively address employment challenges within the extractive sector.

Keywords:
raw materials, export restriction, employment, extractive industries

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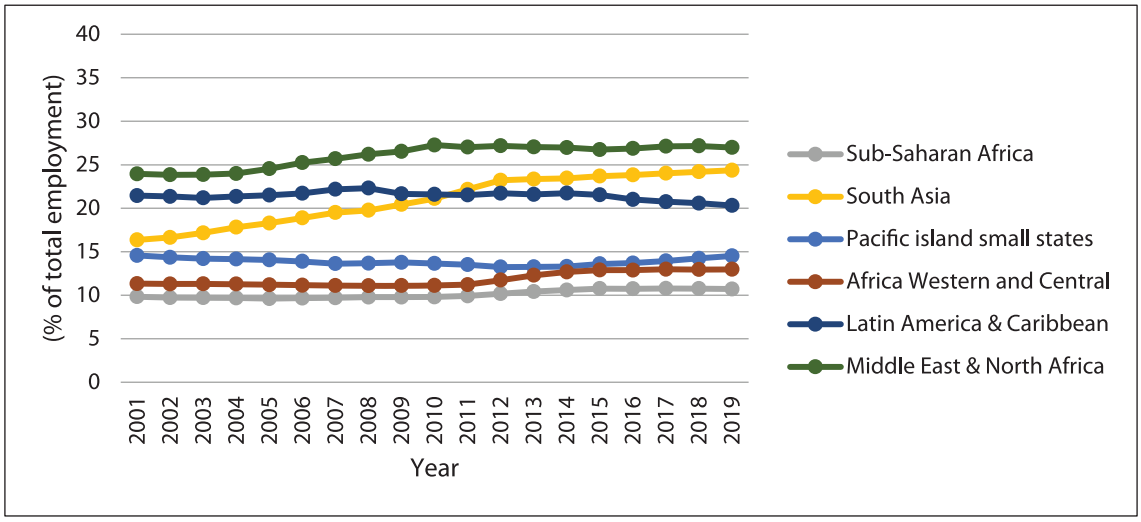
INTRODUCTION

Over the last decades, countries around the globe have increasingly used restrictive measures on raw-material exportation, mainly to promote the development of higher-value downstream processing jobs on the domestic market (OECD, 2019). The World Trade Organization (WTO) asserted that since early 2000, at least 80 countries/ territories have implemented raw material export restriction policies, and more than 80% of the restrictions are still in force in 2022. While a growing number of empirical studies have identified the causal impact of imposing export restrictions on international trade (Melek & Ojeda, 2017; Wubbeke, 2013; Massari & Ruberti, 2013; Korinek & Kim, 2011; Balistreri & Worley, 2009) and the global value chain (Bown et al., 2021; Handley et al., 2020; Mancheri et al., 2019; Fajgelbaum et al., 2020; Fujio, 2013; Daudin & Schweisguth, 2011; Korinek & Kim, 2010) research examining its effect on the economies of exporter countries, particularly towards the country's employment, has been scarce.

It is imperative to note that for a country with high activity in extractive industries, its mining sectors arguably provide little direct employment (Addison & Roe, 2018; Aragón & Rud, 2013; Kinnaman, 2011; Latina et al., 2011; Matsushita, 2011; Kim J, 2010). Further, in their 2019 report, the OECD suggests that at the aggregate level, the mining sector usually occupies a small share of total employment (see Figure 1). Some countries seek to generate more jobs by imposing export restrictions on unprocessed materials. However, scholars are divided on the employment-generating effect of export restrictions where some argue to have a positive impact (Bernard et al., 2004; Brambilla et al., 2014; Ostensson, 2017; Vyboldina et al., 2016), while others suggest the reverse result (Fu & Balasubramnayan, 2005; Fung & Korinek, 2013; Korinek & Kim, 2010).

Figure 1. Employment in extractive industries as a percentage of total employment in selected regions



Source: OECD and World Bank (2019)

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As Östensson (2017; 2019; 2020) and Roe (2017) suggest, an export restriction policy might encourage more processing industries in the downstream sectors and eventually generate more employment. With more raw materials available for domestic use, producer countries will have more options to diversify their products and arguably will attract more firms to create more job opportunities (Brown et al., 2021; Jacob & Pedersen, 2018; Östensson, 2017; Roe, 2017). It will also allow countries to specialize in resource-heavy produced goods (Brambilla et al., 2014; Roe, 2017; Yan et al., 2011). Additionally, restrictive measures on raw materials exportation will help to encourage higher transactions and trade activities since the producer country will be able to fully control the goods from the unprocessed materials and all its derivatives (Östensson, 2017; Roe, 2017).

However, opponents of export restrictions have long argued that this policy is apt to escalate the price of exported products, reducing export quantities (Korinek & Kim, 2011; Fung & Korinek, 2013; Kim, 2010). A decreased export volume will threaten the producer country's employment rate as they have a smaller demand for the goods. Although Korinek and Kim (2010) acknowledged that reduced raw material export could redirect a portion of supply to the local market, exerting a downward force on local prices, they further warned that this measure would establish a gap between domestic prices and the rates levied on international consumers. Subsequently, reduced exports due to export restrictions shift demand to other nations, potentially triggering a global price spiral if those nations respond with similar export-limiting measures. Hence, the objective of this policy, especially to generate more job opportunities in the producer country, appears to be challenging to achieve (Korinek & Kim, 2010; OECD, 2010).

This paper attempts to provide statistical evidence for the arguments above. It aims to estimate the impact of raw materials export restrictions on the aggregate employment rate in the host countries. While prior studies have explored the economic consequences of these policies, their implications for domestic job markets have received limited attention. This study addresses this gap by delving into the employment ramifications of raw material export restrictions. It attempts to introduce a new standpoint using an extensive dataset spanning over a decade and encompassing a diverse set of countries. The question of how raw material export restrictions affect the employment rate of the producer country will be a guide throughout this paper. Given the ongoing scholarly arguments on both proponents and opponents of raw material export restrictions, this paper used two-tailed hypothesis testing, arguing that raw material export restrictions affect producers' country employment rate. Lastly, the primary objectives of this study are twofold: first, to estimate the impact of raw material export restrictions on employment rates in producer countries. Second, to provide empirical evidence that informs the broader discourse on the employment implications of export control policies in the extractive sector. By examining these objectives, this research aims to offer a more comprehensive understanding of the multifaceted effects of export restrictions, especially in terms of their influence on domestic employment.

METHODS

This research used panel data consisting of 74 countries for the period of 2009 to 2021 (selected based on the availability of the data). Employing the Ordinary Least Square method, the paper utilized 3 (three) models of a regression equation.

$$Y_{i,t} = \beta_0 + \beta_1 X_{1i,t} + Z'_{i,t}\beta_2 + \mu_t + \delta_i T + \varepsilon_{i,t}$$

The dependent variable is the employment rate which is measured by employment to population ratio by using the total percentage (%) of workers aged 15 and above from the national estimate (modeled ILO estimates). The first model denoted the dependent variable when it regressed with the raw material export restrictions variable, which in this study, is represented by a dummy variable. The dummy will refer to export activity at the 6-digit level of the HS2007 classification. The export restriction here, due to the limitation of the data, will be broadly defined as all measures of restrictions (export prohibition, export quota, export tax, and export surtax), resulting producer country limiting the quantity of goods exported to foreign buyers. The first model of regression also includes the concentration index, which measures how exports of a country are concentrated on a few products or otherwise distributed in a more heterogenous manner among a series of products; the productivity index which serves as a comprehensive metric, evaluating the effectiveness of productive resources, entrepreneurial expertise, and the interconnectedness of production processes, which together determine the capacity of a country to produce goods; technological index, where it measures how countries estimate the use of machine and technology to produce goods; log of net foreign direct investment (FDI) where the data aggregates equity capital, reinvested earnings, other long-term and short-term capital, as presented in the balance of payments, using real ($ constant) US dollars; and per capita gross domestic product which is a quantification of a nation's economic output per individual. This will be computed by dividing a country's GDP by its population and is expressed in real ($ constant) US dollars.

Then, the second model of the regression includes all independent variables from Model 1 with an addition of time and country fixed effects. Lastly, the third model includes all independent variables from Model 1 and time and country fixed effect in Model 2 with an addition of low-income country interaction variable. The low-income country variable indicates a country that has a GDP per capita below $ 12.962 USD (World Bank threshold to categorize low-income countries and high-income countries). Model 3 is presented with the intention to capture the differences in the effects of export restriction policy among low-income versus high-income countries.

It is imperative to note that most of the dependent variables in this study are factors related to firms' ability to produce goods, derived from the input-output analysis model. Referring to the Cobb-Douglas production function (Q = f (K, L, P, H)), FDI and GDP are proxies for monetary capital, while technology and concentration index are assets that are created for use in the production process. All these four variables will help to understand the physical capital (K) in the equation. Additionally, the productivity

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index is a proxy for entrepreneurship (H) which informs the quality of the business intelligence that is applied to the production function.

In modeling the regression equation, this paper considered the following factors. First, the Hausman test is utilized to decide whether the model should use fixed effect or random effect, as this paper is interested in time-variant variables. Second, as understanding if the data is stationary is crucial before identifying the relationships between the variables, this paper also started the analysis by examining whether the stationary issues exist in the data. Third, this paper also checked for panel heteroskedasticity using the LR test to evaluate the difference between nested models. The result is then used to examine whether the panel is balanced and should any robust standard error model be incorporated. Following this, the paper then examined the serial correlation within the panel by conducting the Wooldridge test. Lastly, it also checked the contemporaneous spatial correlation.

The Hausman test conducted for the model suggests that a fixed effect is favored. Further, the result for the Fisher-type unit-root test based on augmented Dickey-Fuller maintains that the data is stationary in some panels. To rectify the issue, (n-1) time dummies are then included in the specification. This will help to account for "different y-intercepts" within annual cross-sections. Further, it provides a control for individual year effects (i.e., year-specific common shocks, which are constant across countries but vary by year). In addition, after conducting the LR-test, which shows that it is significant and has a balanced panel, this paper decided to use the country-clustered standard error. A serial correlation problem also exists in the panel based on the result of the Wooldridge test; hence, the Prais-Winsten transformation/AR (1) disturbance is then employed. Lastly, as the country-clustered standard error is already in use, the issue of contemporaneous spatial correlation has already been taken into account.

RESULT AND DISCUSSIONS

Table 1 provides statistical evidence about the effect of imposing raw materials export restrictions on host countries' employment, with and without a fixed effect. Model 1 contains the estimates for the effects of an export restriction without applying time and country fixed effects, Model 2 contains the estimates for the effect of an export restriction using time and country fixed effects, and Model 3 contains the estimates for the effect of export restriction when the low-income country interaction term is employed. The coefficient on the primary interest variable in Model 1 shows that imposing raw material export restrictions will decrease the employment rate. Model 2 and Model 3 show a similar result, where restricting the export of unprocessed material will decrease the employment rate, respectively. In addition, the more homogenous products of a producer country from the raw materials are, the more likely they have a lower employment rate. As suggested in Table 1, any additional point on the concentration index of a product will lead to a decrease of 16.61 percentage points (Model 2) and 15.88 percentage points (Model 3) in the employment rate. However, this result is not significant in Model 1.

In the same line, one additional point on the productivity index of a country will decrease the employment rate by around 0.40 percentage points for all models. However, this coefficient is not statistically significant. On the variable of technology index, at 10% and 5% significant levels, one additional point will increase the employment rate by 0.25 percentage points in Model 1, 0.40 percentage points in Model 2, and 0.37 percentage points for the low-income country interaction model (Model 3). Similarly, a 1% increase in log FDI will increase the employment rate by 0.17 percentage points in Models 2 and 3, but this estimation is not significant in Model 1.

Likewise, the log GDP per-capita variable suggests that a 1% increase in log GDP per capita is associated with an increase in employment rate by 0.0018, 0.0036, and 0,0034 percentage points in Model 1, 2, and 3, respectively. Additionally, as Model 3 suggests, compared to a high-income country, in a low-income country, the raw material export restriction will cause employment rates to increase by 0.21 percentage points. However, this result is arguable since the causality effect is not strongly established. Additionally, from the margin command estimation, the hypothesis that there is a statistically significant difference between rich and poor countries on the effect of export restriction on employment is also rejected. Accordingly, reflecting on the result, the hypothesis that export restriction on raw materials affects employment is rejected. The regression model does not hold statistically significant power to explain the causal relationship between the export ban and employment rate.

The findings of this study contradict the idea that limiting the export of raw materials can create job opportunities for the domestic markets, which has been a concern for many advanced and developing countries. These countries often resort to export restrictions policies such as export taxes, export quotas, export licensing, or complete export bans for various reasons, including employment purposes (Jacob & Pedersen, 2018; Östensson, 2017; Roe, 2017; Korinek & Kim, 2010). These policies may also serve political and economic goals, as they can favor specific producer and consumer groups. However, the regression analysis results in this research support the argument made by the World Trade Organization (2010) that export limitations are often deemed less effective in achieving distributional goals. Instead, alternative policy instruments like direct support or subsidies, as well as income taxes, could prove to be arguably more efficacious in accomplishing these objectives (Korinek & Kim, 2010; Östensson, 2017; Roe, 2017).

Although the result turns out to be insignificant in this regression, the trade policy theory, especially the Heckscher–Ohlin model, justifies the behavior of exporter countries that attempt to promote more down-streaming activities of raw materials and wish to generate more high-value-added goods by limiting their export of unprocessed goods. When an export restriction policy is imposed, as Fliess et al. (2017) assert, the price of the materials for non-domestic buyers will increase, and its supply to the global market will decrease. Subsequently, this will make more raw materials accessible for domestic use at a more affordable price below the world market. This condition will arguably lead to more domestic firms being encouraged to utilize the unprocessed material as an

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input to expand, diversify, and promote their products to the local and global market at a more competitive price (Fliess et al., 2017; Kasahara et al., 2016; Bas, 2012; Milner & Tandrayen, 2007; Turco & Maggioni, 2013)

Table 1. Employment Rate and Raw Material Export Restriction in Three OLS models

Variables	Dependent Variable: Employment Rate		
	(1)	(2)	(3)
	Model 1	Model 2	Model 3
Export Restriction	-0.381	-0.260	-0.374
	(0.618)	(0.219)	(0.229)
Concentration Index	18.52	-16.61**	-15.88**
	(2.710)	(6.676)	(6.702)
Productivity Index	-0.470	-0.401	-0.408
	(0.177)	(0.317)	(0.318)
Technology Index	0.250*	0.402**	0.375**
	(0.134)	(0.163)	(0.164)
Log FDI	2.111	0.175*	0.171*
	(0.203)	(0.0913)	(0.0881)
Log GDP Per-capita	0.118***	0.362***	0.342***
	(4.32e-06)	(0.000112)	(0.000103)
Low-Income Countries			-2.173***
			(0.722)
Low Income with Export Ban			0.216
			(0.428)
Constant	9.643	61.96***	63.87***
	(7.064)	(10.63)	(10.78)
Observations	759	759	759
R-squared	0.203	0.252	0.274
AIC	5371.417	3000.549	2970.986
BIC	540.832	3028.333	3008.032
Country FE	NO	YES	YES
Year FE	NO	YES	YES
Number of Country	74	74	74

Standard errors are in parentheses. *** , ** and * indicates significance in a 99% confidence interval (p<0.01), 95% confidence interval (p<0.05) and 90% confidence interval (p<0.1), respectively.

Similarly, Bernard et al. (2004) and Brambilla et al. (2014) further argue that export limitation effectively functions as an implicit form of subsidy for the downstream sectors by making production input more available at lower prices. This condition will enable a country to gain a larger share of the export market as their domestic firms are incentivized to have more variety of products, at least those that are resource intensive, and more market sectors to sell (Bernard et al., 2004; Brambilla et al., 2014). Bernard et al. (2004) and Brambilla et al. (2014) also maintain that in developing countries, in particular, the extractive industries continue to contribute significantly to the gross

domestic product (GDP), which shows that there has been negligible diversification away from these sectors. In this context, Bernard et al. (2004) and Brambilla et al. (2014) emphasized the significance of the role played by government policies in creating incentives for diversification, one of which is through raw materials export restriction. By imposing a raw material export restriction policy, a producer country is expected to have more downstream industries to produce higher value-added unprocessed materials; hence, the need for manpower will also increase (Bernard et al., 2004; Brambilla et al., 2014). Dergachova et al. (2021) suggest similar findings where if a country can diversify its extractive minerals into more semi or finished goods, they could generate more jobs as they will provide more options in the labor market.

Additionally, export restrictions are frequently implemented to foster the growth and development of downstream processing sectors within a country (Korinek & Kim, 2010). This approach is often driven by the desire to counteract or mitigate the effects of tariff escalation, a phenomenon where tariffs on processed or value-added products are higher than those on raw materials or primary goods (Korinek & Kim, 2010; Kasahara et al., 2016; Bas, 2012). These measures can be a strategic tool to leverage the market influence wielded by the country implementing them, particularly when that nation possesses a substantial share of the export market (Korinek & Kim, 2010). When a country holds a significant market share, it can use export restrictions to exert control and influence over international trade dynamics with its possessed raw materials. By strategically limiting the export of their materials, the country can effectively manipulate supply and demand, potentially driving up prices or negotiating more favorable trade terms. This practice allows the country to capitalize on its dominant position in export markets, shaping the economic outcomes to its advantage and reinforcing its position as a critical player in the global trade landscape (Fliess et al., 2017; Kasahara et al., 2016). In either case, as noted in the OECD report (2019), export restriction-applying countries adopt these measures to enhance their domestic welfare and economic well-being.

It is interesting to note, however, that despite the theoretical justification above, the regression result, although insignificant, has a negative coefficient sign for the export restriction variable in all models. These insignificant findings on the effect of raw materials export restrictions on employment rate and the coefficient signs in all models align with the OECD Trade Policy Studies report. In their papers entitled *The Economic Impact of Export Restrictions on Raw Materials* (2010) and *Aid for Trade: Economic Diversification and Employment* (2019), OECD affirms that export limitation on unprocessed materials will have detrimental impacts on resource allocation, global trade, and industries both on the exporter side and importer side. Thus, the theoretical assumption referred to here under the Heckscher–Ohlin model to explain the behavior of producer countries in imposing export restrictions seems not applicable in this context. This result could also be driven because raw materials and their dependent sectors make up such a low share of total employment, especially in developing countries.

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OECD (2019; 2010) further maintains that rather than having the expected benefit of restricting raw material export as a subsidy for supplying cheaper materials for downstream industries, it is more likely that export restrictions have a detrimental impact on international trade and investments, which, in turn, can lead to a potential decline in the long-term supply of raw materials. By imposing such restrictions, countries disrupt the smooth flow of essential resources in global markets. This disruption disrupts the efficient allocation of raw materials and discourages foreign investments in the affected sectors due to the uncertainties surrounding export restrictions. Consequently, reducing foreign investments in raw material extraction and production may undermine the long-term supply capacity. This scenario raises concerns about raw material resources' sustainability and availability to meet future demands, posing potential challenges for industries reliant on these resources. This scenario will also cause uncertainty about raw material prices at the global level, which negatively affects the overall trade chain.

Lastly, the regression models also present an exciting finding that implies that producer country should diversify their products and produce more value-added goods by advancing their technological use to generate more job prospects in their extractive industries. When producer countries can diversify their product, the model shows that the employment rate can be positively affected (inferred from the significant coefficient of concentration index). Likewise, technology utilized by firms also positively affects the employment rate. Therefore, it is suggested that the producer country should invest more in technology to provide more choices and opportunities for processing the raw materials.

CONCLUSION

The main finding of this paper is that raw material export restriction has no causal effect on employment. There is insufficient statistical evidence to infer that the alternative hypothesis is true. The paper, thus, is not adequate to support the argument that restricting raw materials to export will shift the domestic firms' roles from only operating in upstream industries, such as mining, to mid and downstream, such as extracting and refining crude material, which can boost the job-generating effects for the host countries. In contrast, the implication of this paper might have supported the finding of the OECD's report (2010) that raw material export restrictions negatively impact industries in producer and importer countries. This paper also further informs us that producer countries need to diversify more of their products and improve their technological use in their firms to affect the employment rate from their extractive industries sectors positively.

Additionally, it is imperative to note that this paper uses a relatively broad definition of export restrictions. It includes all measurements listed in the OECD categories of export restriction activities, from export ban to export quota. Future research might consider using more specific definitions to capture more accurate estimations. In addition, another limitation of this study is that the employment data is collected from all sectors, focusing on something other than the industry that produces goods/services from raw

material production. Further, the raw materials data referred to here use the 6-digit level of HS2007 classification, which also has many categories, from aluminum to zirconium, where they are used in various industries. Therefore, a study focusing more on raw material employment and further specific industry classification will help explore the possible causal relationship between export restriction and employment. Lastly, future research might also consider adding more periods and countries to increase the study's sample size to get higher precision and more confidence in the estimates.

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	2012	2013	2014	2015	2016	2017
Fundraising	52.271	76.036	115.415	147.512	174.018	186.608
Financing	46.886	68.181	102.655	147.505	179.284	187.886
Asset	66.090	97.519	145.467	195.018	229.557	244.197

Source: Islamic banking statistics, Bank of Indonesia

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