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How Effective are Policy Interventions Against the COVID-19 Infection Rates?

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Abstract

Studies on the COVID-19 pandemic are more likely to concentrate on the effects of the virus while ignoring its time-series characteristics, particularly its stationarity characteristics. Thus, this study attempts to investigate the effectiveness of policy interventions against COVID-19 by determining the permanent or transitory effects in 5 major regions and the ten most infected countries. Using the endogenous multiple breaks unit root tests introduced by Kapetanios (2005), the findings indicate that only the impacts of shocks to COVID-19 infection rates in France are likely to be permanent. However, the transitory effect is found in Brazil, Germany, Iran, Italy, Russia, Spain, Turkey, the United Kingdom, and the United States. The country where the shock has a permanent impact is suitable for policy interventions, including lockdowns, social isolation, and local isolation. While herd immunity, which protects the entire population against COVID-19, is better ideal for application in countries that experience shocks with a transitory effect.

Keywords:
COVID-19; infection rates; permanent shock; transitory shock; unit root

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INTRODUCTION

A novel coronavirus was eventually identified in Wuhan, Hubei Province in China in late December 2019. The International Committee of Taxonomy of Viruses (ICTV) termed the virus as 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. Then, the WHO issued a global alert about this deadly new infectious disease in early January 2020. At least 215 countries have reported cases of this new coronavirus, infecting more than 5 million people with a death toll of over 300 thousand worldwide by mid-May 2020. Thus, this pandemic has been declared as a global health emergency and has caused an unprecedented human and health crisis.

To date, scientists are working at breakneck speed to find an effective vaccine for COVID-19. In mid-March 2020, Europe was at the epicentre of the COVID-19 pandemic, followed by the United States in April 2020. Because of the alarming levels of spread, severity, and inaction of the political parties, billions of people were sent into lockdowns as health services struggled to cope (Liao et al., 2020). Several countries brought in travel restrictions on flights and visitors from the at-risk area were quarantined on arrival. Furthermore, travel within major cities across the globe has ground to a halt as restrictions on movement and social contact have come into force (Honey-Rosés et al., 2020). In doing so, the spread of the coronavirus has taken a toll on global economic players and is poised to increase global unemployment as it has potentially pummelled global economies.

Given that the COVID-19 epidemic has re-written almost every aspect of people's lives, a variety of studies have considered the possible impacts of COVID-19 on financial markets, political uncertainty, poverty, society, tourism, as well as the global environment (e.g., Al-Malkey & Al-Sammak, 2020; Goodell, 2020; Mamun & Ullah, 2020; Lai et al., 2020b; Nicola et al., 2020; Sharif et al., 2020; Yezli & Khan, 2020). On the contrary, studies of the microbiological underpinnings of the COVID-19 pandemic on human-to-human differences have taken place. For instance, Stehlík et al. (2020) have identified the exponential curve from a microbiological point of view as a reasonable model for the outbreak of COVID-19 epidemics. Furthermore, Buonsenso et al. (2020) explored the microbiological and immunological aspects of SARS-CoV-2 infection in children, which emphasises the key distinctions from adult SARS-CoV-2 infection.

To this end, studies on the COVID-19 pandemic are more likely to focus on the impacts of COVID-19 while neglecting the time-series characteristics, particularly the stationarity properties of the COVID-19 infection series. It is imperative to know whether the time-series data is either stationary or non-stationary as this knowledge has significant implications for policymaking and econometric modelling, as highlighted

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in Rath &Akram (2021) and Narayan & Popp (2010). More specifically, if the series of COVID-19 infection rates is found to be non-stationary (or a unit root), then any shock that influences the series tends to have a permanent effect because it would not return to its long-run growth path, meaning that the infection rates of COVID-19 would permanently shift from one level to another.

On the contrary, if the series of COVID-19 infection rates is found to be stationary, then the impact of shock (or policy shock)[1] on the series tends to be transitory as the effect would diminish gradually and the series would return to its long-run growth path. As a result, a policy shock on COVID-19 tends to have a short-span effect. In terms of forecasting, if the series is found to be stationary, then the future movement of COVID-19 infection rates is predictable with respect to its past values since it is mean-reverting. Nonetheless, the infection rates are unpredictable if the series is non-stationary because the series tends to deviate from its mean either in a positive or negative direction whenever it is exposed to shock. Obviously, knowledge of the degree of stationarity of COVID-19 data contributes not merely to the literature, but more importantly, also helps in public policymaking and benefits society in general. In light of these implications and uniqueness, we contribute to the literature and policymaking by investigating empirically the degree of stationarity of the COVID-19 infection rates in the 5 major geographical regions of the world (e.g., the Americas, Europe, Asia, Africa, and Oceania) and the 10 most infected countries. In an effort to affirm the stationarity of COVID-19 infection rates, we employ the multiple breaks (*m*-break) unit root tests introduced by Kapetanios (2005). Unlike the earlier procedures (e.g., Zivot & Andrews, 1992; Lumsdaine & Papell, 1997), the *m*-break unit root test utilises the sequential strategy of Bai & Perron (1998) to improve the efficiency and consistency in detecting the unknown breakpoints. As a result, it is more advanced and precise than previous unit root tests with structural breaks.

The balance of this paper is as follows. The methodology and data used in this study will be discussed in Section 2. The findings and discussion of this study will be reported in Section 3 and Section 4 respectively. Finally, Section 5 provides the concluding remarks.

METHODS

The purpose of this study is to examine the stationarity of COVID-19 infection rates. In an effort to validate whether COVID-19 infection rates belong to a stationary or non-stationary process, we conduct the endogenous single- and double-break unit root tests introduced by Kapetanios (2005), which are extended from the Zivot and Andrews (1992). To perform the Kapetanios' *m*-break unit root test, we estimate the following Model A (break in the intercept), Model B (break in the slope), and Model C (break in both the intercept and the slope):

[1] Any government policy or unpredictable events that have significant economic impacts are referred to as policy shocks. In this study, the term "policy shock" refers to any measure taken by the government to combat the COVID-19 epidemic, such as lockdown, quarantine, and so forth.

$$\text{Model A: } y_t = \alpha_0 + \alpha_1 t + \delta y_{t-1} + \sum_{i=1}^{k} \omega_i \Delta y_{t-i} + \sum_{j=1}^{m} \theta_j \, \mathrm{DU}_{j,t} + \varepsilon_t \quad (1)$$

$$\text{Model B: } y_t = \alpha_0 + \alpha_1 t + \delta y_{t-1} + \sum_{i=1}^{k} \omega_i \Delta y_{t-i} + \sum_{j=1}^{m} \gamma_j \mathrm{DT}_{j,t} + \varepsilon_t \quad (2)$$

$$\text{Model C: } y_t = \alpha_0 + \alpha_1 t + \delta y_{t-1} + \sum_{i=1}^{k} \omega_i \Delta y_{t-i} + \sum_{j=1}^{m} \theta_j \, \mathrm{DU}_{i,t} + \sum_{j=1}^{m} \gamma_j \mathrm{DT}_{j,t} + \varepsilon_t \quad (3)$$

Where $\Delta = (1 - L)y_t$, L is the lag operator, t is the deterministic time trend variable, and ε_t is the disturbance term assumed to be normally distributed and white noise. Δy_{t-i} is the lagged dependent variable accommodated into the model to account for the existence of a serial correlation problem. Besides, we set the maximum lag length at fourteen days before choosing an optimum lag (k) using the Bayesian Information Criterion (BIC), which is equivalent to the incubation period of coronavirus. In this study, we set $m = 2$ which is the maximum number of unknown breakpoints.[2] $\mathrm{DU}_{i,t}$ is the level shift dummy variable while $\mathrm{DT}_{i,t}$ is the trend break dummy variable. $\mathrm{DU}_{i,t} = 1$ if $(t > \mathrm{TB}_i)$, $\mathrm{DT}_{i,t} = 1$ if $(t > \mathrm{TB}_i)(t - \mathrm{TB}_i)$, zero otherwise where $\mathrm{TB}_i + 1$ represents the dates of the ith breakpoints. This implies that if $(t > \mathrm{TB}_{i,t})$, then the time trending break variable $(\mathrm{DT}_{i,t})$ started from the period of $\mathrm{TB}_i + 1$ will be accommodated into the model to capture the slope trend break. The breakpoint, (TB_i) is ascertained endogenously by the maximum value of $t(\hat{\lambda}_{\inf})$ for δ in absolute terms. It is important to note that despite the unit root test with structural break usually superior to the standard one, especially when the series is confronted with structural change, the results remain sensitive to the choice of model. In the aspect of modelling, Sen (2003) documented that Model C is preferable to other models because it tends to have a smaller error. Nonetheless, Narayan (2005) argued that there is no consensus evidence that Model C is superior to other models. Motivated by these conflicting arguments, we extend the general-to-specific principle of Chang & Nieh (2004) to select the best model for the *m*-break unit root test based on the *t*-significance of the level shift and slope dummy variables. The model selection procedure begins by estimating the double-breaks model (also known as Model CC) which consists of both level shift and slope dummy variables ($\mathrm{DU}_{1,t}$, $\mathrm{DU}_{2,t}$, $\mathrm{DT}_{1,t}$, and $\mathrm{DT}_{2,t}$). The double-breaks Model CC will be selected if all the specified dummy variables are statistically significant. However, the double-breaks Model AA will be selected if only both of the levels shift dummy variables ($\mathrm{DU}_{1,t}$, and $\mathrm{DU}_{2,t}$) are significant. Likewise, if only both of the slope dummy variables ($\mathrm{DT}_{1,t}$, and $\mathrm{DT}_{2,t}$) are found to be significant, the double-breaks Model BB will be chosen for testing the presence of a unit root. Subsequently, if only part of the specified dummy variables is significant, then the single-break model will be used (i.e., Model A, B and C) for testing the presence of a unit root.

[2] Despite the fact that the *m*-break unit root test allows one to examine the presence of a unit root up to five unknown breaks, the Monte Carlo simulation of Kapetanios (2005) reveals that the power of the test is generally low for models with a higher number of unknown breakpoints. Hence, the present study considers only cases with one and two unknown structural breaks in order to avoid an unnecessary reduction in sample power.

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The analysis of this study used the daily data of the COVID-19 infection rates from 1st February 2020 to 14th May 2020. The data used in this study are collected from the *Our World in Data*.[3] The series are converted into natural logarithms in an effort to induce stationarity. The choice of sample is mainly based on data availability and the severity of the infected countries. As such, the sample period varies across the countries and regions under review. The sample and descriptive statistics are reported in Table 1. This study covers the 5 major regions in the world (e.g., Africa, the Americas, Asia, Europe, and Oceania) and also the 10 most infected countries, namely the United States, Spain, Russia, the United Kingdom, Italy, Brazil, Germany, Turkey, France, and Iran.

Table 1. Sample and Descriptive Statistics

Countries	Sample	Obs.	Min	Mean	Max	Std. Dev.
World	01-Feb – 14-May	104	527	41336.38	101445	36457.61
Regions:						
Americas	25-Feb – 14-May	80	1	23622.59	62037	18258.47
Europe	22-Feb – 14-May	83	14	19560.72	37256	12116.30
Asia	01-Feb – 14-May	104	413	6768.72	18254	5410.29
Africa	12-Mar – 14-May	64	13	1131.78	3730	921.19
Oceania	27-Feb – 14-May	78	1	107.37	662	158.61
Top 10 countries:						
United States	27-Feb – 14-May	78	1	17829.40	48529	13067.22
Spain	24-Feb – 14-May	81	1	2839.75	9222	2684.13
Russia	12-Mar – 14-May	64	4	3785.33	11656	4020.77
United Kingdom	28-Feb – 14-May	77	2	2983.01	8719	2230.75
Italy	22-Feb – 14-May	83	14	2675.92	6557	1799.39
Brazil	11-Mar – 14-May	65	9	2906.91	11385	3166.08
Germany	26-Feb – 14-May	79	2	2193.57	6294	1934.99
Turkey	16-Mar – 14-May	60	16	2385.20	5138	1459.17
France	26-Feb – 14-May	79	2	1781.29	7578	1658.78
Iran	20-Feb – 14-May	85	2	1356.29	5275	898.56

RESULT AND DISCUSSION

This study attempts to explore the time series property of COVID-19 infection rates. The empirical results of the present study are reported and discussed in this section. Before examining the time series property, it is best to review the pattern and the growth rates of the COVID-19 infection cases over the analysis period as shown in Table 2. In general, the infected cases of COVID-19 in the world and the selected countries show

[3] One may concern about the reliability of the data source. In fact, *Our World in Data* has been cited in many scientific works and widely used in research articles, reports, books, lectures, videos, radio programmes, podcasts, and presentations cite. Chagla and Pai (2021), Mathieu et al. (2021) and Murthi and Reed (2021) are among the excellence examples. In addition, *Our World in Data* is a trusted database in research and media including *Science*, *Nature*, PNAS, and *the Wall Street Journals*. More importantly, it has been used in teaching at various reputable academic institutions including Harvard, Stanford, Cambridge, MIT, Oxford and California Berkeley. Therefore, the data extracted from *Our World in Data* has achieved the scientific integrity that the data is complete, verified, and undistorted.

an accelerating trend. Among the 5 major regions, results show that approximately 86.3 per cent of the infected cases are discovered in Asia, while the other regions covered less than 15 per cent of the cases, especially in February 2020. However, the diseases spread rapidly to countries in other regions in the following month. For example, we find that at the end of February 2020, the selected 10 most infected countries covered just a small fraction of the world's infected cases, which is approximately 1.8 per cent.

Table 2. The Patterns and the Average Growth Rates of COVID-19 Cases

Countries	29-Feb	31-Mar	30-Apr	14-May	Average Growth (%) (Mar-May)
World	85203	777187	3131487	4298983	170.10
Regions:					
Americas	41 (0.05)	188701 (24.28)	1293563 (41.31)	1889807 (43.96)	315.80
Europe	1097 (1.29)	427186 (54.97)	1291060 (41.23)	1623540 (37.77)	113.99
Asia	73468 (86.23)	159341 (20.50)	493162 (15.75)	703947 (16.37)	126.12
Africa	–	5032 (0.65)	36630 (1.17)	72434 (1.68)	362.84
Oceania	4 (0.00)	5302 (0.68)	8114 (0.26)	8375 (0.19)	28.13
Top 10 countries:					
United States	66 (0.08)	164620 (21.18)	1039909 (33.21)	1390746 (32.35)	282.72
Spain	34 (0.04)	85195 (10.96)	213435 (6.82)	272646 (6.34)	89.13
Russia	2 (0.00)	1836 (0.24)	99399 (3.17)	242271 (5.64)	2728.81
United Kingdom	18 (0.02)	22141 (2.85)	165221 (5.28)	229705 (5.34)	342.63
Italy	888 (1.04)	101739 (13.09)	203591 (6.50)	222104 (5.17)	54.60
Brazil	1 (0.00)	4579 (0.59)	78162 (2.50)	188974 (4.40)	874.37
Germany	57 (0.07)	61913 (7.97)	159119 (5.08)	172239 (4.01)	82.62
Turkey	–	10827 (1.39)	117589 (3.76)	143114 (3.33)	503.89
France	57 (0.07)	44550 (5.73)	128442 (4.10)	140734 (3.27)	98.94
Iran	388 (0.46)	41495 (5.34)	93657 (2.99)	112725 (2.62)	73.03

Note: The data are collected from *Our World in Data*. Figures in the parenthesis (.) indicate the proportion of coronavirus-infected cases.

Surprisingly, the proportion of infected cases in these countries increases drastically to around 70 per cent of the world's infected cases in the subsequent months. Despite the United States' lead in coronavirus cases, our preliminary assessment infers that the spread of the disease in the United States is far behind Russia, Brazil, Turkey, and the United Kingdom. For example, from March to early May 2020, the cases of the outbreak

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in the United States grew on average at a rate of nearly 283 per cent every month, but the virus spread extraordinarily at the rates of approximately 2729 per cent, 874 per cent, 504 per cent and 343 per cent in Russia, Brazil, Turkey, and the United Kingdom, respectively. Indeed, the monthly growth rates of infected cases in other countries, such as Spain, Italy, France, Germany, and Iran, are also greater than 50 per cent. The quick spread of the disease in these countries is probably attributed to the lack of national pandemic prevention action (e.g., implementing lockdowns, social distancing, or isolation measures) because the political leaders have under-estimated the severity of the diseases (Plümper & Neumayer, 2020). Besides, this outcome may also be associated with the aspect of tourism. Tourism is another possible channel that accelerates the transmission of the diseases since the highly infected countries, particularly the United States, Spain, France, Germany, the United Kingdom, Turkey, and Italy, under our investigation, are the world's most visited destinations (World Tourism Organisation, 2019). Given that these countries are the epicentre of the outbreak, it is crucial to further extend our study to analyse whether the shock to COVID-19 infection rates has a permanent or transitory effect via the Kapetanios (2005) *m*-break unit root test.

Table 3 portrays the unit root results from the broader perspective, i.e., the world and the regional levels. Based on the results reported in Table 3, most of the regions under investigation, except for Europe, are subjected to two structural breaks, despite the break dates varying marginally across the regions, ranging from 24 February to 20 April. Moreover, we find that only Models CC, BB, and B are selected. This implies that rates of COVID-19 infection are more likely under a break in the slope of the trend function (Models B and BB) and a simultaneous break in the level and the slope of the trend function (Model CC). As such, the rates of COVID-19 infections across the regions are likely to grow over time.

Focusing on the estimated coefficients for the dummy variables for the breakpoint (DU_1, DT_2, DU_2, and DT_2), we discover that most of the dummy variables are statistically significant at the 5 per cent level. Specifically, the results show that the world's COVID-19 infection rates are subjected to two breaks in the slope of the trend function (DT_1, DT_2) with the estimated coefficients of 0.106 and –0.066. This suggests that the world's COVID-19 infection increases more rapidly after 25 February, then declines gradually after 28 March. The same pattern was also found in the Asia region after 24 March and 8 April. However, the estimated coefficients show that the trend of COVID-19 infection rates in Africa, the Americas, and Europe tends to decline by approximately 0.151, 0.130 and 0.051 respectively. Likewise, our results show that the level shift in Africa is approximately –0.527 on 28 March and –0.205 on 6 April. Furthermore, the COVID-19 infection rates in the Oceania region are subjected to both level shifts and trend breaks but their effects are inconsistent. We find that there is an upward level shift in the COVID-19 infection by 0.527 on 24 March but it shifts downward by 0.279 on 20 April. In contrast to the level shift, our results show that the trend break of the COVID-19 infection in Oceania decreased by 0.279, then increase by approximately 0.095.

Table 3. Results of the Kapetanios Unit Root Test with Structural Breaks by Regions

	World	Africa	Americas	Asia	Europe	Oceania
Model	BB	CC	BB	BB	B	CC
Lag length (*k*)	1	0	2	7	8	1
$t(\hat{\lambda}_{\text{inf}})$	–13.375***	–10.696***	–6.891***	–5.725***	–3.797	–5.643
TB_1	25-Feb	28-Mar	22-Mar	24-Mar	20-Mar	24-Mar
TB_2	28-Mar	06-Apr	01-Apr	08-Apr	–	20-Apr
DU_1	–	–0.527*** (0.000)	–	–	–	0.527** (0.042)
DT_1	0.106*** (0.000)	–0.151*** (0.000)	–0.130*** (0.000)	0.036** (0.012)	–0.051*** (0.001)	–0.279*** (0.000)
DU_2	–	–0.205* (0.076)	–	–	–	–0.581** (0.019)
DT_2	–0.066*** (0.000)	–0.039* (0.068)	–0.159*** (0.000)	–0.017*** (0.000)	–	0.095*** (0.000)
Diagnostic tests						
χ^2_{NORMAL}	0.013 (0.993)	0.424 (0.809)	0.461 (0.794)	3.467 (0.177)	2.090 (0.352)	0.385 (0.825)
χ^2_{SERIAL}	1.611 (0.447)	4.103 (0.128)	3.146 (0.207)	2.744 (0.253)	1.060 (0.588)	2.532 (0.282)
χ^2_{ARCH}	2.268 (0.132)	0.333 (0.564)	2.553 (0.110)	1.158 (0.282)	0.187 (0.665)	0.059 (0.808)
Critical values		Model B		Model BB		Model CC
1 per cent		–5.014		–5.616		–6.587
5 per cent		–4.495		–5.096		–6.113
10 per cent		–4.144		–4.784		–5.847

Note: ***, ** and * denote statistical significance at the 1, 5 and 10 per cent levels, respectively. The optimal lag length (*k*) is determined by the Bayesian Information Criterion (BIC) and (.) denotes the *p*-values. The critical values are collected from Kapetanios (2005). TB_1 and TB_2 refer to the dates of the first and second breakpoints, respectively. DU_1 and DU_2 are the level shift dummy variables whereas DT_1 and DT_2 are the trend break dummy variables. Finally, $t(\hat{\lambda}_{\text{inf}})$ is the t-statistic for δ which is the coefficient of y_{t-1}.

Turning to the computed statistics of the *m*-breaks unit root test in Table 3, we find that the null hypothesis of a unit root can be rejected at the 5 per cent or better significance levels in the aggregated world data. It is also worth noting that the null hypothesis of a unit root is also rejected at the 5 per cent level in three regions, namely Africa, the Americas, and Asia. In light of these findings, we can deduce that the infection rates of COVID-19, in general, do not possess a unit root (or follow a trend-stationary process), except for Europe and Oceania. Given that the series is stationary in Africa, the Americas, and Asia, the infection rates of COVID-19 in these regions are less vulnerable to any shock. Thus, a shock, either positive or negative[4], causes the deviation of COVID-19 infection rates in these regions tend to be transitory rather than a permanent change. This is in accordance with the time-series literature, which states that the data following the stationary process will gradually revert to

[4] The positive shock is that the government strategies, such as movement control orders, travel restrictions, isolation of suspected cases, and the establishment of quarantine centres, are designed to battle COVID-19 or prevent its spread. A negative shock, on the other hand, denotes a lack of cohesion in the government's approach to controlling the COVID-19 epidemic and a relaxation of intervention measures.

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its mean value, even if it deviates transitorily due to a shock or policy intervention. However, our results infer that the shock to COVID-19 infection rates has a permanent effect in Europe and Oceania.

Apart from that, we further validate our unit root findings by implementing a number of diagnostic tests to ensure that the residuals are spherically distributed, serially uncorrelated, and homogenous. To adhere to this purpose, we apply the widely acknowledged Jarque-Bera's test for normality, Breusch-Godfrey's test for serial correlation, and Engle's test for autoregressive conditional heteroskedasticity (ARCH). The results of diagnostic tests are reported in Table 3 and Table 4. We find that the computed statistics of the Jarque-Bera test in all the estimated models do not reject the null hypothesis at the 5 per cent level, demonstrating that the residuals are normally distributed. Likewise, at the same level of significance, the statistics of Breusch-Godfrey's test and Engle's test both consistently do not reject the null hypothesis. These suggest that the estimated models for unit root tests are free from serial correlation and heteroskedasticity problems. Therefore, we can deduce that our unit root findings reported in Table 3 and Table 4 are both reliable.

After establishing the diagnostic tests, we augment our analysis to the 10 most infected countries, and the results are presented in Table 4. We find that most of the estimated coefficients for dummy variables are negative and statistically significant at the 5 per cent level or better, indicating that the model's anticipated structural break dates are strongly accepted and the COVID-19 infection rates decline gradually. Our findings demonstrate that only Turkey and the United States among the top ten infected countries exhibit an upward shift in the COVID-19 infection rates of around 0.730 and 0.688, respectively. However, the infection rates in the majority of the selected countries show at least one negative trend break ranging from approximately –0.033 to –0.289. This finding implies that the infection rates of COVID-19 in the selected countries are steadily dropping.

In tandem with the findings at the regional level, the majority of the COVID-19 infection data at the individual country level was also confronted with two breaks in the slope of the trend function (Models BB, B, and C), except for Iran and Turkey. Consistently, we find that the break dates of the individual countries are mostly distributed around March to April 2020.

Among the 10 selected countries, we were able to reject the null hypothesis of a unit root at the 5 per cent significance level in 9 out of 10 countries, namely Brazil, Germany, Iran, Italy, Russia, Spain, Turkey, the United Kingdom, and the United States. In contrast to Bayyurt and Bayyurt (2020), our results show that the COVID-19 infection rates in these countries are likely to be trend-stationary. This implies that if there is a shock, for example, a large-scale meeting, the infection rates of COVID-19 will increase, but after some time the infection rates will gradually revert to their long-run growth path equilibrium, probably due to the improvement of people's immune systems as suggested by the herd immunity hypothesis.

Table 4: Results of the Kapetanios Unit Root Test with Structural Breaks of 10 Most Infected Countries

	Brazil	France	Germany	Iran	Italy	Russia	Spain	Turkey	United Kingdom	United States
Model	BB	BB	B	A	BB	BB	BB	AA	BB	C
Lag length (*k*)	1	6	10	0	8	1	5	0	5	3
$t(\hat{\lambda}_{\inf})$	−6.042***	−4.550	−6.989***	−6.241***	−5.327**	−13.391***	−5.487**	−11.888***	−8.332***	−7.668***
TB_1	21-Mar	15-Mar	21-Mar	05-Apr	19-Mar	01-Apr	15-Mar	25-Mar	28-Mar	17-Mar
TB_2	04-Apr	01-Apr	–	–	23-Apr	19-Apr	27-Mar	22-Apr	11-Apr	–
DU_1	–	–	–	−0.232** (0.012)	–	–	–	0.730*** (0.000)	–	0.688*** (0.000)
DT_1	−0.137*** (0.001)	−0.152*** (0.002)	−0.289*** (0.000)	–	−0.148*** (0.000)	−0.068*** (0.000)	−0.152*** (0.000)	–	−0.203*** (0.000)	−0.041*** (0.003)
DU_2	–	–	–	–	–	–	–	−0.199*** (0.001)	–	–
DT_2	−0.033** (0.035)	−0.197*** (0.000)	–	–	−0.028*** (0.001)	−0.104*** (0.000)	−0.180*** (0.000)	–	−0.102*** (0.000)	–
Diagnostic tests										
χ^2_{NORMAL}	1.043 (0.593)	1.352 (0.509)	1.198 (0.549)	2.602 (0.272)	4.417 (0.109)	1.622 (0.444)	1.264 (0.531)	1.909 (0.385)	0.619 (0.733)	2.914 (0.233)
χ^2_{SERIAL}	3.263 (0.195)	1.828 (0.401)	3.356 (0.187)	2.491 (0.288)	2.598 (0.273)	0.587 (0.746)	2.514 (0.284)	0.230 (0.891)	4.237 (0.120)	3.144 (0.208)
χ^2_{ARCH}	2.368 (0.124)	0.009 (0.922)	0.473 (0.491)	0.102 (0.750)	0.005 (0.946)	1.030 (0.310)	0.012 (0.910)	0.135 (0.713)	0.002 (0.963)	0.006 (0.939)
Critical values		Model A		Model B		Model C		Model AA		Model BB
1 per cent		−5.338		−5.014		−5.704		−6.162		−5.616
5 per cent		−4.930		−4.495		−5.081		−5.685		−5.096
10 per cent		−4.661		−4.144		−4.820		−5.467		−4.784

Note: ***, ** and * denote statistical significance at the 1, 5 and 10 per cent levels, respectively. The optimal lag length (*k*) is determined by the Bayesian Information Criterion (BIC) and (.) denotes the *p*-values. The critical values are collected from Kapetanios (2005).

Likewise, despite social distancing would effectively alleviate the infection rates of COVID-19, the effect is likely to be transitory due to its mean-reverting behaviour. Nevertheless, we find evidence of the permanent effect of a shock only in France. This result suggests that any policies designed to control the spread of COVID-19, such as the movement control ordering or lockdown policy, would permanently (or effectively) lower the infection rates of COVID-19 in France.

The breaks date as in Table 3 and Table 4 concur with numerous chains of COVID-19 transmission clusters in the infection's countries. In the majority of the cases, the structural break dates were identified in early 2020, especially in February and March. These structural breaks might coincide with some events or policy interventions. The outbreaks in these countries were identified by importing infections that arrived from China and European countries (Giovanetti et al., 2020). At the same time, the virus spread very quickly due to the failure of leadership in countries such as Brazil, Turkey, Russia, and the United States. Populist leaders across the political spectrum are handling the COVID-19 outbreaks with their optimistic bias and ignorance of science, which puts their countries at risk (Plümper & Neumayer, 2020). Moreover, the restrictions on travel implemented differ from country to country after April 20, 2020, causing a spike in coronavirus infections originating from overseas travellers such as Iran, European

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nations, and the United States (Russel et al., 2021). Thus, strict policy measures and effective steps should be put in place based on the findings to contain the epidemic.

On the other hand, the findings indicate that the shocks are found to permanently influence the COVID-19 infection rates in France alone since there is a unit root. The spread of the pandemic in France was traced back to a cluster found in February that was linked to a prayer meeting at an evangelical church in Mulhouse. These clusters triggered the country's pandemic and spread across the nations, causing authorities to struggle with a lack of professional and medical equipment to contain a rapidly spreading virus (Desson, 2020). Additionally, France had the mistaken belief in the pre-crisis period that their health system was sufficient to protect against the epidemic and that they were mainly safe from pandemics (Rowe et al., 2020). When the number of infections accelerates, the government to reduce the spread of COVID-19 in France has included which leads to an overloaded health system, containment measures —lockdown policies—. Furthermore, many people have lingering fears about resurgence cases, fear of dying alone, and anxiety about asymptomatic cases. Thus, the stringent social distancing or lockdown in France could be made obliged to avoid a disastrous rebound in coronavirus cases and break the chain of transmission through the population.

Furthermore, the results also suggest that the effect of a shock like social distancing on the COVID-19 infection rates in Brazil, Germany, Iran, Italy, Russia, Turkey, the United Kingdom, and the United States is only transitory. This advocates that the social distancing measures might only temporarily decrease the rates of infection. Therefore, a herd immunity strategy should be recommended for these countries where it depends on the majority of the population gaining antibodies or immunity that the patient has acquired and offers him protection (Randolph & Barreiro, 2020). If the government wants to let the herd immunity approach go live, then the governments and policymakers must strengthen their public health system by expanding its testing, tracing, and treatment capacity (OECD, 2020), as this approach relies on allowing a large number of the population to become infected (Randolph & Barreiro, 2020). For instance, the nation's citizens must scarify their digital privacy to allow contact tracers to retrace the movements of infected people and everyone they have been in close contact with. Public authorities need to keep monitoring the situation closely, and most importantly, the hospital must have enough capacity to resist the overwhelming numbers of infected patients while waiting for a cure and a vaccine.

CONCLUSION

This study attempts to examine the time-series property of COVID-19 infection rates in the 5 major geographical regions and the 10 most infected countries. Regarding the empirical findings, we discover that the infection rates of COVID-19 are stationary in Africa, the Americas, and Asia, except for the European and Oceania regions. Furthermore, only 8 out of the 10 most infected countries are observed to be stationary. On the other hand, the COVID-19 infection rates data are found to be non-stationary only in France. As such, we may conclude that a shock or any COVID-19 related policy intervention in France tends to have a permanent impact on COVID-19 infection rates.

Therefore, lockdown, social distancing, and community-level isolation would be able to flatten the epidemic curve since these will have permanent effects on the infection rates in France. On the other hand, the shock would have a transitory effect in 8 of the 10 most infected countries. Thus, the decision to introduce herd immunity is essential to protect the whole population against COVID-19. The success of disease control will be highly dependent on the support of the international community which could have collective action in disease surveillance and continuous self-monitoring.

Although this study adds to the policymaking on COVID-19 and the applied time-series literature, particularly in the model selection procedure for unit root tests with breaks, it has a handful of limitations. Likewise, this study merely looked at the unit root property of COVID-19 infection rates in a few selected countries, while downplaying the importance of COVID-19 fatality and recovery rates in a larger sample of countries. Therefore, the current findings might not perfectly reflect the global scenario of COVID-19. Another weakness of the present study resides in the use of the Kapetanios (2005) *m*-break test to determine the presence of a unit root. Even though the *m*-break unit root test is an advanced version of the unit root test with structural breaks as it can cover up to 5 structural breaks endogenously, the power of the test decreases drastically whenever the number of breaks increases. In light of these imperfections, future studies may revisit the subject by expanding the sample, diversifying the indicators of COVID-19, and applying different types of unit root tests to provide more comprehensive and insightful evidence. To further enhance robustness, future studies might also consider utilising panel unit root tests both with and without structural breaks. Finally, future research may also segregate the countries based on their levels of economic development and health-related indices and examine the factors that determine whether the impacts are temporary or permanent.

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Improving Food Security through Financial Inclusion

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Abstract

Financial inclusion may accelerate food insecurity reduction, an issue in Indonesia's development. However, studies examining the relationship between financial inclusion and food security remain inconclusive and scarce in Indonesia. Therefore, this study aims to analyze how strong the relationship between those variables is, both in general and within specific groups. This study mainly used data from the National Socio-Economic Survey (Susenas) 2020. Food security is measured by dietary diversity score (DDS), while financial inclusion is measured by household accessibility to savings and credit. The association between those variables is examined using the Ordinary Least Square (OLS) method. The results show that financial inclusion is positively related to household food security at a significant level, in general, and according to poverty status and location category. Therefore, expanding financial inclusion may be suggested as an alternative to improve food security.

Keywords:
food security; dietary diversity score; financial inclusion

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INTRODUCTION

So far, food security is still a general problem that has been worked on not only at the national level but also globally. Food security has to be improved because of its strategic role in health and productivity (Rusmawati & Hartono, 2021). Food security is a key to achieving healthy, intelligent, active, and productive human resources (Badan Ketahanan Pangan, 2019). Meanwhile, according to several previous studies, the inability to maintain food security is strongly related to health deterioration both physically (Ziliak & Gundersen, 2017) and mentally (Nagata et al., 2019), obesity increase (Brewer et al., 2010), chronic conditions increase such as cardiovascular disease (Seligman, Laraia, & Kushel, 2010) and diabetes (Billimek & Sorkin, 2012), and individual quality of life (Gyasi et al., 2019).

Food security is a state where people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that fulfills their dietary needs and food preferences for an active and healthy life (FAO, 2008). Therefore, food security is identified to be based on four dimensions, which are availability, accessibility, utilization, and stability. Availability is reflected by supply, or the availability of sufficient food which can be affected by the production, stock levels, and net trade of food. Accessibility describes the possession of sufficient resources to obtain food that meets nutritional standards. Therefore, an adequate food supply in an area does not guarantee food security at the household level. Utilization means the guarantee of a person's ability to consume food that is available according to nutritional needs. Lastly, food stability reflects the sustainability of the previous three dimensions all the time. Thus, even though a person's food consumption is sufficient at a certain time, it can be categorized as food insecure if the access is not sustainable over time or risking a deterioration of nutritional status that may be caused by various factors such as weather conditions, political instability, or economic instability (FAO, 2008).

The FAO (2021) stated that food security has continued to decline since 2014, and 720-811 million people in the world were estimated to experience hunger by 2020. If there's no acceleration to overcome this issue, the number will reach 660 million by 2030 due to the prolonged effects of the pandemic (FAO, 2021). Whereas, based on the second goal SDGs, it is expected that by 2030 all countries will end hunger and achieve food security and nutritional improvements.

Similar to global conditions, Indonesia is still experiencing food security problems. Badan Ketahanan Pangan (2019) noted that 76 out of 514 districts/cities are still experiencing food vulnerability. Meanwhile, compared to other countries, Indonesia's Global Food Security Index (GFSI) is ranked 62 out of 113 countries. This indicates that the availability, affordability, quality, and safety of food in Indonesia are still lagging behind other countries. The status of nutritional fulfillment in Indonesia is still considered less than international standards with high variations between regions (Arif et al., 2020). Therefore, Indonesia is still working on improving the resilience of food.

On the other hand, FAO (2013) stated that most of the individuals who live in rural areas and experience hunger do not have access to or are excluded from the formal

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financial system. Murendo et al. (2021) stated that financial inclusion is very important for low-income and marginal groups in society. Financial inclusion is defined as accessibility to financial products and services that are useful and affordable to meet individuals' and businesses' needs such as transactions, payments, savings, credit, and insurance that are used responsibly and sustainably (Demirguc-Kunt et al., 2018). Simply put, financial inclusion is the ability to access financial products and services (King, 2013).

Households with better financial management skills are likely to be food secure since they may optimize their food consumption and can overcome negative financial shocks, such as income decline and unexpected expenditures (Gundersen & Garasky, 2012). Those households may have some savings to serve as an emergency fund to keep the stability of their consumption. This argument is supported by Cnaan et al. (2012), who stated that financial inclusion in the form of easy access to safe and accessible banking will make money management efficient in dealing with emergencies and unstable income flow. Besides that, financial inclusion enables poor households to access affordable finance for undertaking economic activities to gain some advantages (Cnaan et al., 2012). These processes may lead to more food-secure households.

Based on that background, a comprehensive study of the relationship between financial inclusion and food security is necessary. From various previous studies, financial inclusion which is commonly measured at the micro-level through financial services accessibility is still inconclusive. The positive relationship between financial inclusion and food security is demonstrated by Annim & Frempong's (2018) study in Ghana. By applying instrumental variable techniques, Annim & Frempong (2018) concluded that access to credit contributes to an increase in the diversity of food consumed by households. On the other hand, research by Loibl et al. (2017) in the United States and Namayengo et al. (2018) in rural Uganda concluded a negative relationship between financial inclusion and food security. By applying the Tobit regression technique, Loibl et al. (2017) demonstrated that children's food insecurity was recorded higher in families who had payday loans or pawn shop loans and in families who participated in the Individual Development Account (IDA) than the general population. Along with this, Namayengo et al. (2018) with the Difference in Difference (DiD) technique concluded that food security decreased after households took credit. This could be caused by the households having difficulty in paying off the credit installment which later forced them to reduce their consumption (Augsburg et al., 2015).

Prior studies regarding financial inclusion in Indonesia mostly focused on the relationship between financial inclusion to poverty at the regional level (Erlando et al., 2020; Fauzan et al., 2020; Khoirunurrofik & Fitriatinnisa, 2021), the income gap (Khoirunurrofik & Fitriatinnisa, 2021), the development of MSMEs (Adriani & Wiksuana, 2018), and energy poverty (Widyastuti & Hartono, 2022). Most of those studies also utilize macro data available from various sources. To the best of our knowledge, studies of financial inclusion – food security nexus has never been carried out under Indonesian context. Therefore, this study aims to analyze the relationship between financial inclusion and household food security in Indonesia. Using microdata from National

Socio Economic Survey, this study also tries to extend the analysis according to poverty status and household residence location. This study contributes to the literature as a depth analysis of the important role of financial inclusion in improving food security. The findings of this study is expected to contribute as a principle for the formulation of the government policy, especially to increase food security.

METHODS

This study uses data from the National Socio-Economic Survey (Susenas) conducted by Statistics Indonesia in 2020. The data included 334,447 households samples spread across 514 districts/cities in Indonesia. Susenas data is used to obtain information about food security as the dependent variable and also financial inclusion information as the independent variable in this study. Based on the availability of the existing Susenas data, one of the food security measures, which are often used, is the dietary diversity score (DDS). DDS is one of the simplest approaches to measuring the adequacy of food consumption at the household level as an indicator of food security (Cafiero et al., 2014). DDS describes the diversity of food consumed, which is considered a key element of the diet and is measured by summing the number of food groups that households consume over a given period. According to the concept used in Susenas, the reference time used is the last week before the data collection and the calculation of the score includes 12 food groups. The food group consists of grains, tubers, fish, meat, eggs and milk, nuts, vegetables, fruits, oil and coconuts, beverages, seasonings, and other consumption. The group does not cover the consumption of alcoholic beverages, cigarettes, and tobacco.

Some academics mentioned that DDS has several advantages. First, food diversity reflects both macronutrients and micronutrients which are important components of food safety and nutrition (Ruel, 2003). Second, food diversity is considered more in accordance to capture the real conditions, where wealthier people tend to switch their consumption from high-calorie foods to more nutritious ones (Jensen & Miller, 2010). Third, food diversity also has a good performance in measuring economic status and malnutrition, is sensitive to shock, and is relatively inexpensive to implement (Headey & Ecker, 2013).

One of the disadvantages of DDS is that it is often criticized for its lack of comparison between countries. In its application, there are differences in calculating diversity, for example, based on food groups, food codes, or even food composition (Steyn et al., 2006). However, because the study does not aim to find comparisons between countries, the weakness of the DDS does not affect this research. In addition, although it can be said that DDS cannot be considered a comprehensive measure of food security, DDS can describe energy consumption at the household level. If analyzed together with information related to other measures of food security, a comprehensive picture of food security status and its impact on access to diverse diets (Cafiero et al., 2014).

In addition to food security, Susenas is also used to obtain financial inclusion data. In this case, financial inclusion is measured by access to banks and access to credit. These variables are dummy with a value of 1 if the household has access and

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0 if it does not have one. Households are said to have access to a bank if there are household members who have savings accounts in financial institutions. Households are also said to have access to credit if in the past year there are household members who have received credit either from banks, unions, pawnshops, financing companies, joint business groups (KUBE / KUB), or Village-Owned Enterprises (Bumdes).

The study also used several control variables which were selected based on previous studies by Abor et al. (2018), Gyasi et al. (2021), Murendo et al. (2021). Those control variables consist of the head of the household's characteristic variables (gender, marital status, age, education, work status), the household's characteristic variables (location, household size, disability, asset ownership, and savings ownership), and characteristic variables at the district/city level (per capita gross domestic product of agricultural sector, the market ratio per 1,000 residents and the store ratio per 1,000 residents). The head of the households and household variables are obtained from Susenas data, while the characteristic variables at the district/city level are obtained from GDP publication published by Statistics Indonesia and Village Potential Data Collection.

The gender variable is valued 1 if the household head is a male and 0 if it is female. The marital status variable is valued by 1 if the household head is married, otherwise, it is valued 0. The age variable is a continuous variable of the age of the household head. The education variable consists of 5 categories, which are not graduating from elementary school, graduating from elementary school, graduating from junior high school, graduating from senior high school, and higher than senior high school. The work status variable is a dummy variable with the category of not working (reference category), working in the agricultural sector, and working in the non-agricultural. The location variable is valued 1 if the household lives in an urban area and is valued 0 if the household lives in a rural area. The household size variable is a discrete variable of the number of household members. The disability variable is valued 0 if there is a household member with a disability and is valued 1 otherwise. The assets variable is valued 1 if the household has at least 1 type of asset and is valued 0 if it has no assets at all. The personal saving variable is valued 1 if the household has at least 10 grams of gold/jewelry and is valued 0 if the household has less than 10 grams of gold/jewelry or none at all. Various control variables are incorporated into the model to reduce bias.

To answer the purpose of the study, which is to analyze the relationship between financial inclusion and food security, the Ordinary Least Square (OLS) linear regression model will be applied. This method is chosen because of its ability to examine the relationship between continuous dependent variables and some independent variables. The OLS method minimizes the square value of the difference between the observed responses in the data group to the predicted response using a linear approach. Mathematically, the research model can be written as follows:

$$DDS_i = \alpha_0 + \alpha_1 saving + \gamma_s X_i + \varepsilon_{1i} \quad (1)$$

$$DDS_i = \beta_0 + \beta_1 credit + \gamma_c X_i + \varepsilon_{2i} \quad (2)$$

Coefficients α_1 is the magnitude of the relationship between access to savings and household food security as measured by the dietary diversity score, coefficient β_1 is the magnitude between access to credit and household food security, and X_i is the control variable inserted into the model.

In addition to the main model estimation, the study will also conduct some follow-up analyses. First, heterogeneity analysis according to poverty status and location where the household lives. Second, perform the Oster test to ensure that possible biases in the model do not change the direction of the study variable coefficient (see Table 4).

RESULT AND DISCUSSIONS

Table 1 shows a statistical summary of each research variable. It is known that on average, households have a food diversity score of 10.47. A higher value of food diversity score indicates higher food security. In general, it can be said that the food diversity score is relatively high because it is higher than 8. This classification is based on research by Murendo et al. (2021) and Pauzé et al. (2016) which classify food diversity scores into 3 categories, namely low (score 0-5), medium (score 6-7), and high (score 8-12). Meanwhile, the average access to savings and access to credit was 0.6530 and 0.2008, respectively. In other words, about 65.30 percent of households have access to savings and 20.08 percent of households have access to credit.

Table 1. Research Variable Statistical Summary

Variable	Mean	Standard Deviation	Minimum Value	Maximum Value
(1)	(2)	(3)	(4)	(5)
Dependent Variables				
DDS	10.4740	1.5495	1.0000	12.0000
Independent Variables				
Access to Saving	0.6530	0.4760	0.0000	1.0000
Access to Credit	0.2008	0.4006	0.0000	1.0000
Characteristics of the Household Head				
Marital Status	0.7936	0.4047	0.0000	1.0000
Gender	0.8404	0.3662	0.0000	1.0000
Age	49.1066	13.5053	11.0000	97.0000
Education	2.9269	1.3332	1.0000	5.0000
Working in Agriculture	0.3818	0.4858	0.0000	1.0000
Working in Non-Farm	0.4967	0.4999	0.0000	1.0000
Household Characteristics				
Location	0.4128	0.4923	0.0000	1.0000
Number of Household Members	3.7648	1.7107	1.0000	26.0000
Disability Status	0.0531	0.2243	0.0000	1.0000
Asset Ownership	0.9496	0.2188	0.0000	1.0000
Personal Saving	0.1745	0.3795	0.0000	1.0000
District/City Level Characteristics				
Ln Agricultural GDP per Capita	8.3469	1.1412	3.5042	10.7350
Market Ratio	0.1790	0.1644	0.0000	1.5281
Store Ratio	7.9433	4.0749	0.0418	28.3446
Number of Observations	334,447			

Source: Susenas 2020, processed

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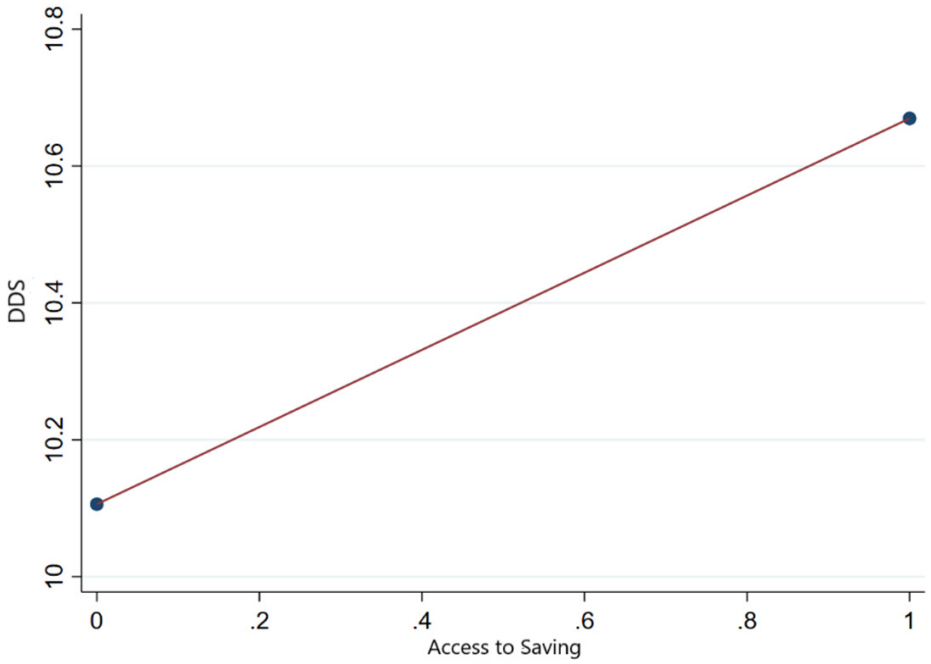
The head of the household generally has the characteristics of married (79.36 percent), male (84.04 percent), with an average age of 49.11 years, completed a minimum of elementary/equivalent education, and worked in the non-agricultural sector (49.67). In addition, it can be seen that a household averagely has 3 to 4 members. There are 41.28 percent of households living in urban areas, 5.31 percent of households have members with disabilities, 94.96 percent of households have at least 1 type of asset and 17.45 percent of households have personal saving. At the district level, the market ratio per 1,000 residents is 0.18, while the store ratio per 1,000 residents was 7.94.

Figure 1. Access to Savings and Food Security Relationship



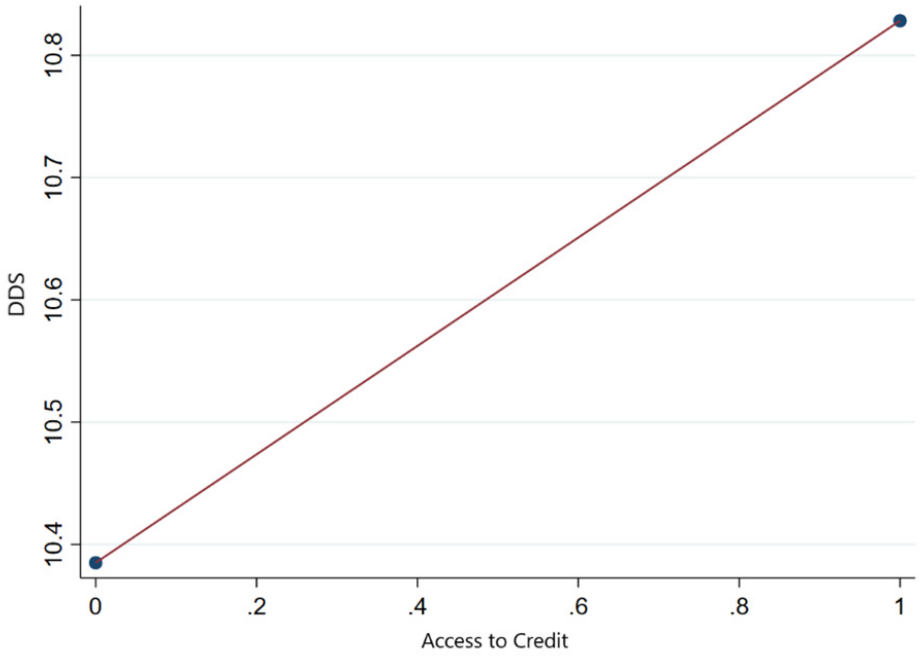
Source: Susenas 2020, processed

By plotting the variables (see Figure 1 and Figure 2), it can be seen that there is a positive relationship between financial inclusion and food security. This means that households with inclusive finances tend to have better food security. Comparing both of the graph, it can be seen that access to savings – food security nexus has a steeper slope compared to access to credit – food security nexus. This gives an early indication that access to savings has a higher effect on improving food security than access to credit. Although this plotting provides a pretty good intuition, it needs to be seen from the results of regression to find out whether the magnitude of the relationship is significant or not.

The results of the regression of access to savings and credit on food security can be seen in Table 2. The results were obtained through robust Ordinary Least Square estimates due to the issue of heteroscedasticity. Models 1 and 2 use the access to

savings as independent variables without control variables and with control variables respectively. Models 3 and 4 use the access to credit as independent variables without control variables and with control variables respectively. Models 5 and 6 use both access to savings and credit access as independent variables without control variables and with control variables respectively.

Figure 2. Access to Credit and Food Security Relationship



Source: Susenas 2020, processed

Based on Table 2, it can be seen there is a positive relationship between access to savings and access to credit in food security, with coefficients of 0.179 and 0.156, respectively. At the mean level, access to savings is associated with the improvement of food security by 1.71 percent, while access to credit is associated with the improvement of food security by 1.49 percent. Some control variables also have a positive relationship to food security, namely the marital status of the household head, age of the household head, work status of the household head, household location, household size, household asset ownership, and household personal saving. In addition, the control variables at the district/city level that are recorded to have a positive relationship with food security are agricultural GDP per capita and store ratio.

Generally, the result is similar to the research conducted by Murendo et al. (2021) in Zimbabwe, which stated that financial inclusion increased food diversity by 12 percent and food consumption by 14 percent although this study yields smaller magnitudes. The smaller magnitude of those associations, in this case, is possible because the initial DDS in Indonesia is relatively high (10.474), compared to the average DDS in Murendo et al. (2021), which is 8.06 for financially included households and 6.87 for financially excluded households.

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Table 2. Financial Inclusion Regression Results on Household Food Security

	Independent Variables					
	Access to Saving		Access to Credit		Access Saving and Credit	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Access to Saving	0.564***	0.201***			0.508***	0.179***
	(0.006)	(0.006)			(0.006)	(0.006)
Access to Credit			0.443***	0.187***	0.318***	0.156***
			(0.006)	(0.006)	(0.006)	(0.006)
Marital Status		0.894***		0.891***		0.885***
		(0.013)		(0.013)		(0.013)
Gender		-0.558***		-0.563***		-0.559***
		(0.014)		(0.014)		(0.014)
Age		0.00643***		0.00637***		0.00649***
		(0.000)		(0.000)		(0.000)
Education		-0.0142***		-0.00595**		-0.0142***
		(0.002)		(0.002)		(0.002)
Work in Agriculture Sector		0.126***		0.103***		0.123***
		(0.010)		(0.010)		(0.010)
Work in Non		0.323***		0.311***		0.310***
Agriculture Sector		(0.010)		(0.010)		(0.010)
Location		0.193***		0.206***		0.194***
		(0.006)		(0.006)		(0.006)
Household Size		0.143***		0.148***		0.141***
		(0.002)		(0.002)		(0.002)
Disability Status		-0.557***		-0.584***		-0.555***
		(0.016)		(0.016)		(0.016)
Asset Ownership		0.605***		0.630***		0.594***
		(0.015)		(0.015)		(0.015)
Deposits		0.334***		0.362***		0.332***
		(0.006)		(0.006)		(0.006)
Ln Agricultural GDP		0.0147***		0.0128***		0.0120***
per Capita		(0.003)		(0.003)		(0.003)
Market Ratio		-0.126***		-0.117***		-0.108***
		(0.016)		(0.016)		(0.016)
Store Ratio		0.0382***		0.0382***		0.0379***
		(0.001)		(0.001)		(0.001)
Observation	334,447	334,447	334,447	334,447	334,447	334,447

Standard errors in parentheses

* p< 0.05, **p < 0.01, ***p < 0.001

Based on the financial services type, access to savings and access to credit both associate positively with food security measured by household dietary diversity score. The positive relationship between access to savings and food security is in line with the study conducted by Baborska et al. (2020). The study found that the use of formal savings services reduces the probability of experiencing food insecurities significantly among individuals who live in rural areas of low-and middle-income countries. It implies that individuals deciding to save money at formal financial institutions enable them to accumulate and access extra money when necessary, and thus are less worried about the resources needed in obtaining food. Meanwhile, the positive relationship between access to credit and food security supports the research by Annim & Frempong (2018), which found that access to credit contributes to a more diversified diet of Ghanaian household, which is measured by food diversity index and food consumption score.

An interesting fact is seen in Table 2 where the variable coefficient of access to savings (0.201) is greater than the variable coefficient of access to credit (0.187). In other words, savings ownership has a stronger association with the increasing diversity of food consumed by households. This can be understood because taking credit for investment implies a repayment commitment that may put a burden on income and consumption when one's resources are limited (Baborska et al., 2020). However, the positive association between access to credit and food security shown in Table 2 clarifies that households are still able to balance out the burden and the advantages.

Table 3. Heterogeneity by Poverty Status and Location

	Poverty Status		Location	
	Poor	**Not Poor**	**Rural**	**Urban**
(1)	**(2)**	**(3)**	**(4)**	**(5)**
Access to Saving	0.148***	0.133***	0.215***	0.114***
	(0.006)	(0.021)	(0.007)	(0.010)
Access to Credit	0.131***	0.125***	0.192***	0.0824***
	(0.006)	(0.031)	(0.008)	(0.010)
Control Variables	Yes	Yes	Yes	Yes
Number of Observations	311,820	22,627	138,045	196,402

Standard errors in parentheses

* p< 0.05, **p < 0.01, ***p < 0.001

To analyze the difference or heterogeneity of the relationship magnitude between financial inclusion and food security, the study used regression-based on poverty status and location. Poverty status is divided into poor and not poor, while locations are categorized

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into rural and urban areas. The relationship pattern in each category is similar to the main regression results, where access to savings has a stronger association with food security than access to credit does.

According to poverty status, it can be seen that access to savings has a greater influence on the food security of poor households (0.148) than non-poor households (0.133). At the mean level, access to savings has an effect of 1.41 percent on improving the food security of poor households and 1.27 percent on non-poor households. Meanwhile, access to credit had a smaller effect, 0.131 for poor households and 0.125 for non-poor households, or 1.25 percent for poor households and 1.19 percent for non-poor households at the mean level. These results are supportive of Murendo et al. (2021) research that highlights the importance of financial inclusion for low- and marginal-income groups in society.

According to the location, access to savings is associated with increasing the food security of households living in rural areas by 0.215 points or 2.05 percent (see Table 3). This magnitude is higher than those living in urban areas, which is about 0.114 or 1.09 percent. Along with this, access to credit was also associated with an increase in the food security of households living in rural areas by 0.192 or 1.83 percent. This number is more than twice the association magnitude in households living in urban areas, which was 0.0824 points or 0.79 percent. Intuitively, the impact of financial inclusion is expected to be greater for rural areas than urban areas. It can be estimated that rural environments have limited financial services facilities. Therefore, some previous studies only focused on the issue of financial inclusion in more vulnerable groups, namely households living in rural areas, as done by Murendo et al. (2021) and Baborska et al. (2020).

Table 4. Oster Test Results

	Independent Variables	
	Access to Savings	**Access to Credit**
(1)	**(2)**	**(3)**
Delta	1.305	2.122
Beta	0.121	0.141
Uncontrolled Coefficient	0.564	0.443
Controlled Coefficient	0.201	0.187
Uncontrolled R-squared	0.030	0.013
Controlled R-squared	0.155	0.153

A comparison of financial inclusion coefficients on the estimation results using the OLS method with and without control variables can be seen in Table 2. The results indicate that the estimation model is robust since the coefficients are quite consistent on various specifications. However, without considering the R-squared movement, the stability of the coefficient is less informative (Oster, 2019). Therefore, to ensure the consistency

of regression results will be carried out robustness is checked by running Oster test (see Table 4). By applying the Oster test, we can see whether the unobserved bias causes a change in the coefficient direction or not.

The delta value indicates the bound estimate or degree of selection on the unobservables relative to the observables. A delta value of 1.3 in a model that uses access to savings as an independent variable means that the unobservables must be 1.3 times more meaningful than the observables to produce a beta of zero or to express the absence of effects from treatment. A delta value of 2.1 in a model that uses access to credit as an independent variable means that the unobservables must be 2.1 times more meaningful than the observables to produce a beta of zero or to express the absence of effects from treatment. Meanwhile, the beta value indicates the magnitude of the bias-adjusted treatment effect. The beta value on the model that uses the independent variable access to savings is 0.121 and the one that uses access to credit is 0.141. From the coefficient comparison between models with and without control variables, it can be seen that all of them have the same direction. This means that the bias in the OLS model does not cause the coefficient to change direction and indicates that the estimated results are quite robust as well.

CONCLUSION

Food insecurity is still a problem that needs to be addressed in Indonesia. On the other hand, financial inclusion is believed to be one of the alternatives to accelerate the handling of various problems in economic development, including food insecurity. However, empirical evidence of the impact of financial inclusion on food security in Indonesia is still scarce. To meet that knowledge gap and contribute to the growing literature on the important role of financial inclusion, the study aims to analyze whether financial inclusion has an impact on improving food security at household level. This study utilized Susenas 2020 data and several other supporting data. Using the OLS method, the study produced several findings that could provide some policy implications. Financial inclusion as measured by access to savings and access to credit was significantly associated with improved household food security as measured by a dietary diversity score (DDS). Based on poverty status and location, financial inclusion significantly improves food security in both poor and non-poor households. Based on these results, if the government wants to improve household food security, then one alternative that can be taken is to increase household financial inclusion. Financial inclusion is significantly associated with improved food security both in households in all economic conditions and across the region. Thus it can be said that the policy of increasing financial inclusion can be applied in general to all households.

Although the results of the estimate are fairly consistent, it should be noted that this study has some limits. First, is the use of cross-section data in the model estimation. This results in the unknown relationship of financial inclusion to food security varying between times. Second, the variable of financial inclusion is measured by household access to

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formal financial services so it cannot describe how those financial services are utilized by households. This is due to the unavailability of data that can measure the use or utilization of financial services by households. Future research on financial inclusion and food insecurity may be able to improve some of those limitations, for example by using panel data or finding other variables that can better reflect whether or not a household is inclusive in its finances.

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The Asymmetric Effect of Exchange Rate on the Household Consumption Expenditures

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Abstract

Previous literature on the exchange rate and household consumption failed to examine the effect of positive and negative changes in the exchange rate on household consumption expenditures. We extended the available literature by investigating the asymmetric impacts in African emerging economies (AEE). To attain this aim, we utilized the nonlinear ARDL model, which covers both negative and positive shocks in the exchange rate. Our results indicate that movements in the exchange rate have asymmetric impacts on household consumption in all the included emerging economies, excluding Nigeria. Our findings propose recommendations for the policymakers to ensure the alignment of the optimal exchange rate for countries of emerging African economies and propose relevant policies for the countries.

Keywords:
asymmetric bounds test; household consumption; exchange rate; African emerging economies

How to Cite:

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INTRODUCTION

Investors, governments, and macroeconomists take much interest in acknowledging the main factors that determine aggregate consumption. This concept is particularly significant since consumption indicates the economy's vibrancy and is the essential constituent of aggregate demand (Bahmani-Oskooee et al., 2015). Additionally, it is the best instrument for stimulating the economy in recession periods (Okwu et al., 2020). In history, the "psychological law of consumption" by Keynes is the initial effort for the examination of the consumption function's components, which is most popularly recognized as the "absolute income hypothesis" (Keynes, 1936). Keynes's hypothesis states that there is a tendency among people to upsurge their levels of consumption in reaction to the rise in their salary or income. PIH (Permanent Income Hypothesis) presented by Friedman (1957) and LCH (Life-Cycle Hypothesis), stated by Ando & Modigliani (1963), is the other hypotheses on consumption functions. Their studies also noted that the base of these hypotheses is on the postulation that customers or consumers always try to get the maximum level of their satisfaction through the smoothness of their consumption concerning their accessible income over time. Keeping in view the up-to-date economies regarding openness and globalization, Alexander (1952) presented the exchange rate as the main module of the function of household consumption. He described a dependency of the exchange rate's effects on the HC on inflationary trends resulting from the devaluation of local currency and this pass over on the imported raw materials. He further stated that there are negative impacts of the devaluation of local currency on aggregate consumption. Its tendencies of inflation can deteriorate the power of purchasing local currency. Mumtaz and Ali (2020) supported the opinion of Alexander (1952) that because of the degree of openness and globalization, there is a direct effect of the exchange rate on the local prices through variations in imported raw material prices and other related consumables.

In response to the hypothesis by Alexander (1952), different research works have been performed to explore the underlying impacts of exchange rate changes on household consumption. Among these research works, Bahmani-Oskooee & Xi (2012) investigated the effects of exchange rates on household consumption in Japan. Their results show that there are only short-run impacts of exchange rate on consumption. Bahmani-Oskooee et al. (2015) extended the study Bahmani-Oskooee & Xi (2012) to twelve emerging economies. They found that uncertainty of the exchange rate has an essential short-run effect on consumption among all investigated countries, whereas in the long run, the impact was present in only six countries.

Moreover, Oseni (2016) conducted a study based on the dynamic framework GMM and found that the Exchange rate (ER) has negative impact on household consumption (HC) in countries of SSA (Sub-Saharan Africa). In another associated research study, Iyke and Ho (2018) affirmed after considering both short-run and long run that ER has negative impacts on HC in Ghana. However, Mumtaz & Ali (2020) concluded that domestic consumptions are more susceptible to the variations of the exchange rate in India than in Pakistan.

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The current literature in this field has shifted its consideration to investigate the nonlinear association between consumption expenditure and exchange rate. Pavlidis et al. (2015) used linear and nonlinear granger-causality tests to investigate the association between consumption and ER in fourteen different OECD countries. The findings of their study are contradictory to the internationally acknowledged model of the business cycle, which envisages the association between HC and ER. Okwu et al., (2020) also discovered positive impacts of appreciation and depreciation in the exchange rate on household consumption in Nigeria in the long run while applying the nonlinear ARDL model. However, they could not provide information about the impacts of extreme changes in the exchange rate on domestic consumption.

Although a bulk of literature is available about examining the association between the expenditure of domestic consumption and exchange rate, the comparative adjustments of the expenditure of domestic consumption to positive and negative changes in the exchange rates are not known. The available literature commences an adjustment in the expenditure pattern of households at the same proportions as the appreciation and depreciation in the exchange rate. We can say that the available research works do not consider the impacts of positive and negative shocks in the exchange rate on household consumption. Verheyen (2013) suggested that some moments of inaction are present where exporters are not able to react to the variations in the exchange rate because households can't regulate their consumption in a reaction against minor deviations in the exchange rate. On the contrary, there is the presence of some moments of action where there is a significant reaction of households to exchange rate changes. Such conditions show a significant change in household expenditures due to large movements in ER.

We extend the available works based on the above-mentioned arguments. We investigate the different responses of the expenditure of HC to positive and negative changes in the ER. This research study was required because there were mixed outcomes of already available literature. For instance, Mumtaz & Ali (2020) and Okwu et al. (2020) reported a positive association, while Iyke & Ho (2018) and Oseni (2016) stressed the presence of a negative association between domestic consumption expenditure and exchange rate. The probable reason for these contradictory results is that majority of the conducted research studies presumed that there are linear associations among the provided variables. Therefore, this research work is conducted to cover the existing gap in the available literature in this field. This current research study improves the available literature in this field by utilizing an asymmetric ARDL model

Considering common features of African Emerging Economies, this research work pays attention to these countries, including Nigeria, Kenya, Algeria, Morocco, South Africa, and Egypt. The selected six AEE for this current research study is amongst the initial ten economies of Africa with increasing levels of consumption. Due to modernization in business milieus and changes in demographics, HC in these countries is to touch $3.50 trillion at the end of 2030. There is further estimation that African counties will be the resident place for 1/5th population by the next ten years. AEE is the steadiest developing consumer economy in the world, according to the results of a study

conducted by Iheonu & Nwachukwu (2020). They also stated that levels of household consumption of AEE at a very rapid rate compared to their gross domestic product. They also highlighted that, since 2010, the expenditure of household consumption of AEE raised by 4.70% compound annually. It consequently extended to $2.40 trillion by 2015.

Furthermore, there is a high dependency of AEE on imports, and these countries mostly prefer to consume foreign-made goods compared to the consumption of their local products. Therefore, the foreign exchange markets of these countries remain much volatile, and this same factor hurts consumption. Therefore, we have faith that the household consumption expenditure in these countries is highly vulnerable to appreciation and depreciation of exchange rates compared to the other developed or emerging economies of the world. Based on these assumptions, we mainly emphasize the effect of deviations of ER on the expenditures of HC in AEE.

This current research study improves the available information in this field in two separate ways. First, we present the asymmetric ARDL to examine the effect of positive and negative shocks in the exchange rate on household consumption expenditures. Second, this research study extends the current works of Okwu et al., (2020) and Iheonu & Nwachukwu (2020) in the context of African emerging countries' economies. We believe that conducting a study in these economies will provide important policy implications for the relevant stakeholders.

The outcome shows that changes in the exchange rate asymmetrically affect household consumption excluding Nigeria, as consolidated by the Wald test. This information infers significant differences between currency devaluation and appreciation effects on the HC. Additionally, there is an increased sensitivity of household consumption in Morocco, Algeria, and Egypt to an exchange rate appreciation compared to the minor appreciation.

We organized the remaining portion of the study as follows. Section-2 contains the description of methodology and data, Section-3 comprises the statistical analysis of the collected information, and the conclusion is presented in Section-4 of this research study with few policy implications.

METHODS

To provide robust empirical information, we utilized the quarterly time series data covering a span from 1980Q1 to 2019Q4. There were one hundred and sixty observations. Using econometric specifications and rules of thumb, we know that this number is suitable for reliable interpretations. The data series for the income (GDP; Gross Domestic Product) and expenditure of household consumption were available in annual frequencies. We converted these annual frequencies to the quarterly frequencies using the quadratic match sum method of processing. This procedure of quadratic match sum processing is a valuable method that can convert the data sets of low frequencies into a series of high frequencies, and it permits amendments due to deviations based on seasons by dropping the end-to-end dispersions (Uche & Nwamiri 2020; Shahbaz et al.

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(2018); Sharif et al. (2020). We obtained the series from two different data hosts. We accessed the data about the national income (GDP) and household consumption from AfDB (African Development Bank), and we obtained the data about the exchange rate from the International Financial Statistics (IFS). Amongst these included three variables, the variable HC expenditure (measured in US dollars) is the dependent variable, whereas the ER variable is explanatory and normally measured as actual ER. We measured ER so that there is an implication of appreciation with positive shocks and depreciation with adverse shocks of local currency. NI (national income measured by GDP in US dollars) is being utilized as a control variable in this research study. This research is similar to many past studies that also considered the NI an essential factor in household consumption function (Bahmani-Oskooee & Nayeri, 2020; Iyke & Ho, 2019).

Analysis in this research study is grounded on the traditional method of ARDL presented by Pesaran & Shin (1999) and some of its successive adaptations, such as asymmetric ARDL proposed by Shin et al. (2014). The primary purpose of using this model was to uncover the related threshold, which gives the most desired impact. Keeping in view the research works of Okwu et al., (2020), and Iheonu & Nwachukwu (2020), for empirical estimations, we present the following standard econometric specification:

$$\mathrm{lnHCkt} = \mathrm{f(lnERkt,\ lnNIkt,)} \quad (1)$$

In this econometric specification, lnNI, lnHC, and lnER denote the logarithmic values of HC expenditure, a dependent variable, GDP (Gross Domestic Product), presented by NI in economy k at time t, and ER indicates the exchange rate for economy k at time t. There is the use of specification-1 for the formation of econometric specification, having a term for stochastic error presented in the second specification.

$$\mathrm{lnHCkt} = \mathrm{b0} + \mathrm{b1lnERkt} + \mathrm{b2lnNIkt} + \varepsilon_t \quad (2)$$

We defined all the variables earlier with their associated coefficients. The stochastic factor is ε_t which also looks after the other linked factors excluded in this technique/ model. Proceeding further with the following research studies of Anjum (2017), Chang (2018), Chang & Rajput (2018), and Bhutto & Chang (2019), we presented the ARDL (Linear Autoregressive Distributed Lag) from the above-mentioned specification (Equation-2) as;

$$ln\Delta\gamma_t = \beta_0 + ln\beta_1\gamma_{t-1} + ln\beta_2 x_{t-1} + \sum_{i=1}^{n}\theta_1 ln\Delta\gamma_{t-i} + \sum_{i=0}^{n}\theta_2 ln\Delta x_{t-i} + \varepsilon_t \quad (3)$$

In the above-mentioned equation,

γt = Dependent variable

x_t = Independent variable

Δ = Difference operator is

lnI = Natural logarithm notation

εt = Stochastic term

$\sum_{i=1}^{n}\varphi_i ln\Delta\gamma_{t-i}$ = Dynamics of short-run

$\beta_1\gamma_{t-1}$ Shows the equilibrium relationship for the long run.

The typical ARDL model is Equation-3 and we modified this equation with our included variables to practice equation-4 as presented below;

$$\Delta lnHC_{kt} = \beta_0 + \beta_1 lnHC_{kt-1} + \beta_2 lnER_{kt-1} + \beta_3 lnNI_{kt-1} + \sum_{i=1}^{n} \theta_1 \Delta lnHC_{kt-i} + \sum_{i=0}^{n} \theta_2 \Delta lnER_{kt-i} + \sum_{i=0}^{n} \theta_3 \Delta lnNI_{kt-i} + \varepsilon_t \quad (4)$$

Moving forward, we presented the specifications of the long run of non-linear ARDL, NARDL by Shin et al. (2014) as follows;

$$lnHC_{kt} = \beta_0 + \beta_1 lnER_{kt}^{+} + \beta_2 lnER_{kt}^{-} + \beta_3 lnNI_{kt} + \varepsilon_t \quad (5)$$

In this equation, $lnER_t^{+}$ & $lnER_t^{-}$ are the partial sums of positive and negative impacts of the exchange rate on the expenditure of household consumption (HC) with an inclusion of the control variable NI (National Income). The following equations denote the partial sums of positive as well as negative variations as demonstrated by Shin et al. (2014):

$$lnER_{kt}^{+} = \sum_{i=1}^{t} \Delta lnER_{kt}^{+} = \sum_{i=1}^{t} \max(\Delta LnER_i, 0) \quad (6a)$$

And

$$lnER_{kt}^{-} = \sum_{i=1}^{t} \Delta lnER_{kt}^{-} = \sum_{i=1}^{t} \min(\Delta LnER_i, 0) \quad (6b)$$

In these equations $lnER_{kt} = lnER_0 + lnER_{kt}^{+} lnER_{kt}^{-}$

According to the specifications mentioned above, positive and negative long-run coefficients of partial differential sums in ER and HC are given as β_1 and β_2, respectively. In contrast, the coefficient for the dependent variable is β_0, the coefficient for the NI is β_3 used as a control variable. We also formed the long-run equation number 7 in the setting of the NARDL model presented by Shin et al. (2014) for empirical estimation as mentioned.

$$\Delta lnHC_{kt} = \beta_0 + \beta_1 lnHC_{kt-1} + \beta_2 lnER_{kt-1}^{+} + \beta_3 lnER_{kt-1}^{-} + \beta_4 lnNI_{kt-1} + \sum_{i=1}^{n1} \theta_1 \Delta lnHC_{kt-i} + \sum_{i=0}^{n} (\theta_2^{+} \Delta lnER_{kt-i}^{+} + \theta_3^{-} \Delta lnER_{kt-i}^{-}) + \sum_{i=0}^{n} \theta_4 \Delta lnNI_{kt-i} + \varepsilon_t \quad (7)$$

RESULT AND DISCUSSION

We correspondingly present the descriptive statistics and residual time series trend in Table 1 & Figure 1. Jarque-Bera statistics stated that all studied variables have deviated from normality among all recruited countries. This test also shows the time-varying association between the expenditure of HC and extreme variations of ER in all recruited

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emerging economies. Therefore, it justifies the utilization of this particular model that can disclose more thoroughly the time-varying status of developments. The average highest average household consumption was 11.084 in South Africa, 9.002 in Kenya, 8.462 in Nigeria, 8.537 in Egypt, 9.686 in Morocco, whereas 8.080 was the least expenditure of household consumption in Algeria. There was high volatility of the exchange rate in all the selected economies, with the Naira local currency of Nigeria having the most volatility of 2.00, followed by 1.20 volatility of Algeria Dina and 1.00 volatility of Egypt Dina.

Additionally, there was negative skewness in the exchange rates in all these selected economies. Furthermore, all the selected countries with all studied variables were leptokurtic. Consequently, the trend series also states the data set's time-varying nature of all the recruited emerging economies. These series of trends further show that, though there is a difference between deviations in the expenditure of household consumptions and ER from one country to another, there is a single common factor that states that there is noticeable instability in all these selected countries.

Table 1. Descriptive Statistics

Variables	Average	Standard Deviation	Skewness	Kurtosis	Jarque-Bera
Algeria					
HC	8.080	0.343	0.414	1.744	18.077***
ER	3.096	2.201	-0.640	1.750	25.600***
NI	7.907	0.695	0.406	1.442	22.703***
Egypt					
HC	8.537	0.991	0.263	2.704	12.053***
ER	-0.286	2.005	-0.251	3.086	8.317**
NI	12.052	0.630	0.049	3.087	6.376*
Kenya					
HC	9.002	0.876	0.330	2.6535	17.267***
ER	3.335	0.675	-0.780	3.337	26.124***
NI	9.372	0.663	0.617	2.882	23.771***
Morocco					
HC	9.686	0.767	0.022	2.661	12.050***
ER	0.647	0.201	-3.123	10.657	39.360***
NI	10.164	0.838	-0.021	2.610	12.800***
Nigeria					
HC	8.462	3.245	0.305	2.443	22.747***
ER	3.002	4.057	-0.614	3.161	20.715***
NI	8.846	2.205	0.230	2.491	20.299***
South Africa					
HC	11.084	0.521	-0.031	2.784	8.850***
ER	0.267	0.613	-0.415	3.365	12.071***
NI	12.630	0.493	0.072	2.655	13.134***

Note: This very table displays the descriptive statistics of all included variables for each recruited country. We got descriptive statistics before getting the logarithmic values of all these considered variables. ***, **, * shows that the variables are not usually distributed, instigating the rebuke of the null hypothesis of normality at 1.0%, 5.0%, and 10.0% levels f significance correspondingly.

There is a requirement for the ARDL model presented by Pesaran et al. (2001) that no variable should be integrated into order two I(2). Integrating the variables in either order one I(1) or I(0) is compulsory. So, we analyzed the integration order of these variables with the utilization of root tests of the Perron, Augmented Dickey-Fuller, and Lee Strazicich. Table-2 presents the complete summary of the results of unit-root tests. The results of unit root tests show that there was mutual integration of our variables between order-zero I(0) and order-one I(1). In simple words, we can say that some variables were integrated of order zero I(0), whereas others were integrated of order order-one I(1). Since there was conformation of the standard requirements with the results of unit-root tests, we move further with some other empirical assessments using models nonlinear ARDL model. For the utilization of these two models, we select optimal lag length four (4) based on AIC (Akaike Information Criterion) and HIC (Hannan-Quinn Information Criterion). Furthermore, we use the step-wise procedure from general to specific to reach parsimonious results after applying this model.

Figure 1. Plots of Time Series of ER and HC in African Emerging Economies

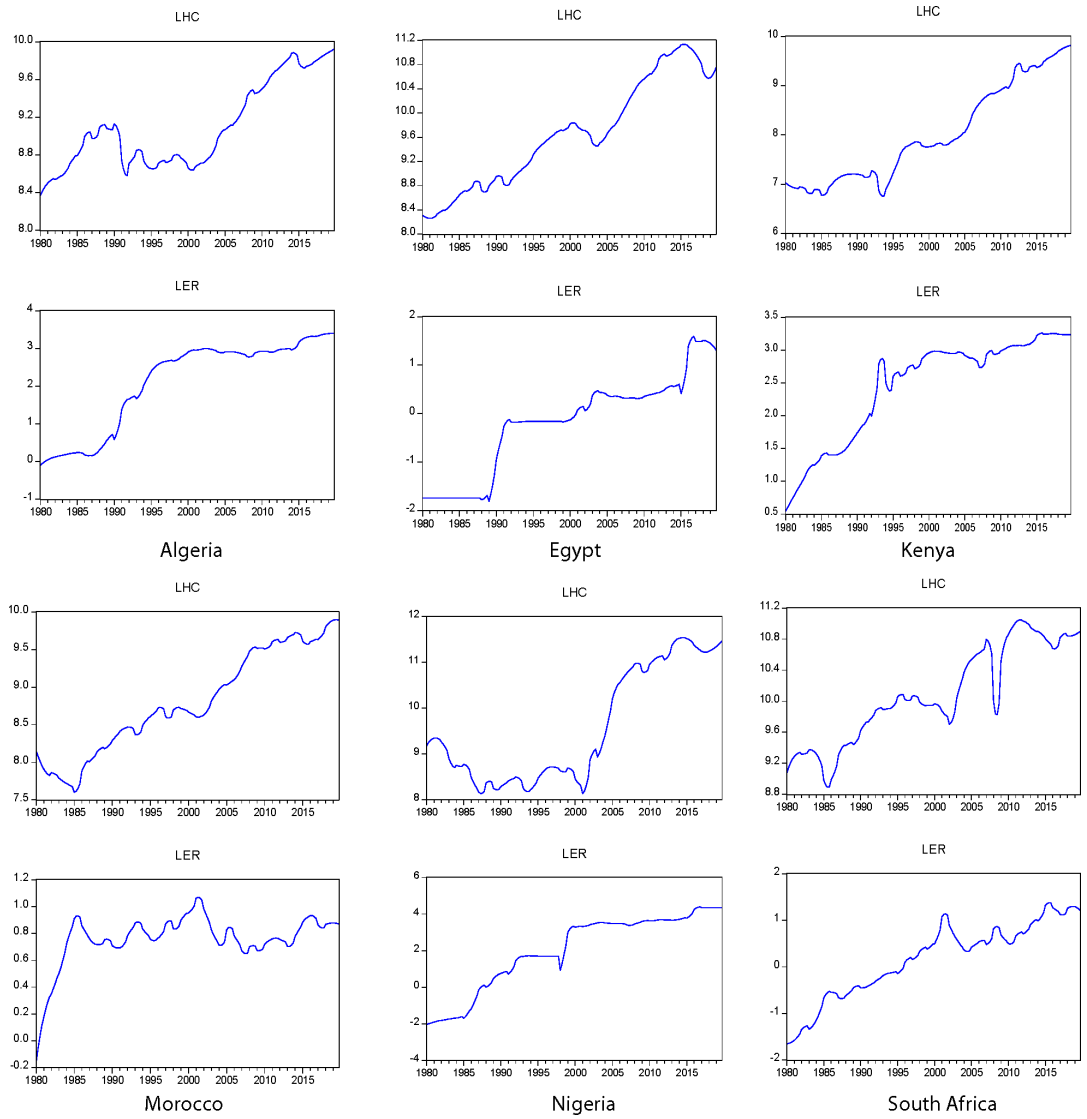

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Table 2. Unit Root Tests

Variables	ADF (Level)	ADF I(1)	L-Z (Level)	Break year	L-Z I(1)	Break year	Perron (Level)	Break year	Perron I(1)	Break year
Algeria										
HC	-0.712	-5.742[a]	-3.088	1991Q-1	-5.687[a]	1984Q-3	-3.650	1990Q-1	-8.441[a]	1991Q-1
ER	-2.562	-4.908[a]	-2.480	1989Q-4	-4.150[a]	1986Q-4	-6.027[a]	1990Q-1	-7.524[a]	1991Q-1
NI	-0.705	-5.608[a]	-2.991	2009Q-2	-5.641[a]	1985Q-3	-2.714	2003Q-2	-6.547[a]	1991Q-1
Egypt										
HC	-0.842	-4.272[a]	-1.861	2013Q-1	-2.431[b]	1999Q-4	-2.640	2006Q-1	-5.116[a]	2003Q-1
ER	-1.033	-5.112[a]	-2.328[b]	1989Q-3	-3.903[a]	1989Q-1	-5.177[a]	1981Q-1	-5.711[a]	1990Q-1
NI	-1.528	-3.677[a]	-3.414[a]	1991Q-2	-2.543[b]	1989Q-3	-3.718	1989Q-1	-6.252[a]	1991Q-1
Kenya										
HC	0.206	-5.535[a]	-1.240	1994Q-1	-5.775[a]	1985Q-1	-3.025	2005Q-1	-8.018[a]	1993Q-1
ER	-1.411	-6.571[a]	-1.046	1994Q-1	-5.750[a]	2007Q-2	-3.164	1991Q-1	-11.67[a]	1993Q-1
NI	0.603	-5.637[a]	-1.562	2013Q-1	-5.954[a]	1982Q-2	-2.608	2005Q-1	-7.770[a]	1993Q-1
Morocco										
HC	-0.174	-5.223[a]	-1.622	1986Q-1	-3.937[a]	1984Q-4	-2.812	1996Q-1	-6.381[a]	1986Q-1
ER	-3.003[a]	-4.486[a]	-1.511	1986Q-1	-2.640[b]	1985Q-3	-4.168[c]	2001Q-1	-5.218[a]	1986Q-1
NI	-0.166	-5.246[a]	-1.642	1986Q-1	-3.971[a]	1984Q-4	-3.006	2013Q-4	-6.065[a]	1986Q-1
Nigeria										
HC	-0.122	-5.828[a]	-2.088	2002Q-1	-5.703[a]	1984Q-1	-5.329[b]	2003Q-1	-7.042[a]	2002Q-1
ER	-1.755	-8.281[a]	-1.913	1998Q-2	-8.551[a]	1983Q-3	-3.132	1986Q-2	-10.79[a]	1998Q-1
NI	-0.314	-5.432[a]	-2.090	1995Q-1	-5.465[a]	1984Q-2	-4.155	2003Q-1	-6.688[a]	1983Q-1
South Africa										
HC	-0.487	-8.234[a]	-5.387[a]	2009Q-1	-5.755[a]	2009Q-2	-3.712	2008Q-1	-8.578[a]	2008Q-1
ER	-1.008	-7.531[a]	-4.758[b]	2002Q-1	-5.821[a]	1985Q-3	-3.783	2001Q-1	-6.982[a]	2001Q-1
NI	-0.871	-6.576[a]	-4.473[b]	2003Q-1	-4.590[a]	1983Q-4	-3.996[c]	2002Q-1	-5.390[a]	2002Q-1

Note: This table summarizes the results of unit root tests of ADF, Perron, and Lee Z statistics of all included variables in the recruited countries of OPEC. Superscripts a, b & c shows unit root's rejection at 1.0%, 5.0% and 10.0% levels of significance respectively.

Subsequently, we utilize the nonlinear ARDL model to assess the long and short-run asymmetric association between the expenditure of household consumption and variations in the exchange rate in African emerging economies. Table-3 presents the bounds test results for the nonlinear ARDL model. The bounds test for co-integration in both variables shows that expenditure on household consumption shares a long-run association with the movements of the exchange rate. We conclude these results since the measured values of F-statistics for these models are much higher than the upper bounds I(1) critical value even at a 99% significance level.

Table-3: Bounds test for nonlinear ARDL model

	Algeria	Egypt	Kenya	Morocco	Nigeria	South Africa
F-Statistics	3.21*	3.82**	9.73***	4.40**	6.32***	8.56***

This table summarizes the bounds test results of the nonlinear ARDL model of expenditure of HC and ER in African emerging countries.. ***, ** and * show the rejection of the null hypothesis of no co-integration at 1.0%, 5.0%, and 10.0% levels of significance.

Table 4 presents the detailed summary of the estimation of standard NARDL presented in equation 4. These studied estimations show that considering both the short and long run, NI, a control variable, positively influences the HC in all the selected emerging economies, excluding Algeria. This finding favors the Keynesian proposition that there is a positive impact of income on the patterns of household consumption. Considering the effects of deviations in ER on the household consumption for AEE, the projected findings state that depreciation and appreciations in exchange rates exert significant negative impacts on consumption for the long and short-run in Algeria. These findings are supported by Chang et al. (2019a), Chang et al. (2019b), Javid & Tehranchian (2018), Arman & Simon (2002), and Chang et al. (2018)

Table 4. Estimates from Nonlinear ARDL Model

	Algeria	Egypt	Kenya	Morocco	Nigeria	South Africa
Panel-A: Long-run coefficients						
ER^+	-0.017**	0.008	0.005	-0.010**	0.003	0.015
ER^-	-0.157**	0.002	-0.067***	0.001	0.031	0.040
NI	-0.010	0.022***	0.096***	0.067***	0.106***	0.226***
Panel-B: Short-run coefficients						
ΔER^+	-0.902***	-	-0.350***	-0.203**	0.039	-0.445***
ΔER^+ (-1)	0.428***	-	0.217***	-	-	0.224
ΔER^+ (-2)	-	-	-	-0.021	-	-
ΔER^-	-0.386***	-	-0.180*	-	0.038	-0.523**
ΔER^-(-1)	-	-	0.228***	0.068	-	0.399
ΔER^-(-2)	-0.070	-	0.091*	0.059	-0.051	-
ΔNI	0.026	0.513***	0.712***	0.899***	0.701***	0.356***
Panel-C: Diagnostics tests						
LM	2.01	2.10	4.22**	0.00	2.09	1.21
Hect	1.21	2.44	3.21	0.05	1.30	0.31
R-Reset	4.10	0.80	2.19	0.89	1.16	2.23
Adj. r^2	0.69	0.81	0.82	0.92	0.66	0.49
Ect	-0.81***	-0.22**	-0.49***	-0.42***	-0.49***	-0.40***
CUSUM	U	-	S	S	S	S
CUSUMSQ	U	-	U	S	U	U
$Wald_{LR}$	4.61**	4.03*	16.23***	3.66*	0.69	1.18
$Wald_{SR}$	81.0***	-	14.31***	2.01	0.49	5.80***

This table provides the summary of the results of the standard NARDL model regarding the impacts of ER on the expenditure of HC in African emerging countries accordingly. ***, ** and * show that the null hypothesis is denunciated at 1.0%, 5.0%, and 10.0% levels of significance. Panels-A and Panel-B provide long and short-run estimations correspondingly, whereas Panel-C characterizes the post-estimation tests for diagnosis. Long and short-run asymmetric tests are $Wald_{LR}$ & $Wald_{SR}$ correspondingly.

In contrast, in the case of South Africa, we found a negative influence in only the short-run, which these are inconsistent with the findings of Chien et al. (2020) and Hashmi et al. (2021). On the contrary, there was an insignificant positive influence of

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depreciation and appreciations in exchange rates on household consumption in Nigeria and Egypt. Appreciation in the exchange rate has a negligible positive effect on household consumption in Kenya. In contrast, there is a negative impact of depreciation in the long run, while there was inconsistency for short-run effects for both depreciation and appreciations. There is a significant negative impact of appreciation in the exchange rate on consumption in Morocco, whereas depreciation has no significant impact in both the short and long run. Diagnostic tests (Panel-C), comprising heteroscedasticity, serial correlation, and stability tests, confirm the reliable nature of these estimations. However, the LM test shows otherwise for Kenya. In addition, there is a fall in the CUSUM graph with 5.0% grid lines for all the selected countries except Egypt and Algeria. In contrast, there is instability in the CUSUMQ graph in all recruited countries except Egypt and Morocco. Various previous studies also found inconsistent findings such as Hashmi & Chang (2021), Hasan et al. (2021), Kollmann (2021).

CONCLUSION

This research is conducted to cover the gap by investigating the impacts of positive and negative shocks in the exchange rate on household consumption expenditure in AEE. We performed this research study because the available literature in this field was unsuccessful in distinguishing the effects of positive variations in the exchange rate from the negative changes in the exchange rate on consumption expenditures. Therefore, this research work provides vital data about the association between these studied variables. It also helps the shareholders implement applicable and proper policies or change their existing policies with flaws.

Empirical assessments grounded on bound tests or co-integration tests reveal that the exchange rate, household expenditure, and national income, a control variable, share a common tendency in the long run. The assessments conducted by the NARDL model show that the exchange rate has a disproportionate impact on the expenditure of domestic consumption in the short-run in South Africa, Kenya, and Algeria. It is the responsibility of the policymakers to make sure the stability of the exchange rate to achieve an encouraging economic environment and reduce the negative impacts of business cycles in Morocco, Egypt, and Algeria. Policymakers should formulate such policies, which will have the capability to prevent the volatility of the exchange rate. Keeping in view the high degree of vulnerability and openness of South Africa, Kenya, and Nigeria, the policies that will discourage reliance on fully, and inclination or preference for products of foreign regions against locally fabricated products are pragmatic. It is important to mention that HC remains constant unabatedly in mentioned countries during the periods of depreciation in the ER rates. These types of policies can raise the level of productivity and can produce the required opportunities for employment in the workforce. There can be a replication of this research work in other countries.

Our estimates further indicate that increase in the exchange rate has a different effect from a decrease in the exchange rate on household consumption expenditures.

Therefore, devising the same policies across an increase and decrease in the exchange rate may lead to unfavorable consequences. For example, the long-run estimates indicate that increase in the exchange rate in Kenya does not significantly affect household consumption expenditures whereas a decrease in the exchange rate significantly affects household consumption expenditures. Therefore, the government in Kenya may take policy measures during decreasing states of their local currency since the increase in the currency has negligible effects on the expenditures. The opposite case applies to Morocco since in Morocco only an increase in the exchange rate significantly affects the consumption expenditures.

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The Spillover Effect of Global Uncertainty on BRICS Stock Markets

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Abstract

Using monthly data spanning from 1993 to 2021 and employing the DCC-GARCH model, this study examines the role of Economic Policy Uncertainty (EPU) as a potential exogenous factor impacting the correlation of Brazil, Russia, India, and China (BRIC) economies' stock markets, which is new to the literature. Further, this dynamic correlation series is used as a dependent variable while EPU of BRIC and USA is used as an independent variable by utilizing the autoregressive distributed lag (ARDL) model. The study finds a positive and significant short-run as well as the long-run impact of Russia's and the US's EPU on their stock markets. In other words, as the EPU of the USA increases, the correlation of BRIC with the USA Stock Market and the World Stock Market increases, suggesting minimum diversification opportunities for the investors. The study also recommends that investors diversify their portfolios by considering cross borders assets avenues to gain maximum returns and reduce portfolio risk.

Keywords:
Economic Policy Uncertainty; BRICs; DCC_GARCG; ARDL; Stock Markets

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INTRODUCTION

Stock markets and the banking system are two main players in the development of any economy, but stock markets play a vital role in the development of any economy (Ake, 2010; Arestis et al., 2001). Alfaro et al. (2004) found that economies with developed financial markets attract more Foreign Direct Investment (FDI). The study conducted by Levine & Zervos (1998) concluded that well-functioning stock markets predict long-term economic development. They also found that stock markets correlate with any economy's current and future economic growth. So, the role of stock markets is obvious and important for any economy, and it is important to determine the factors influencing stock markets. Extensive studies have been conducted to determine the factors impacting stock markets (Al-Shubiri, 2010; Garcia & Liu, 1999; Yartey, 2010).

Being an important part of any economy, the role of stock markets, institutions and the banking system is obvious (Ake, 2010; Alfaro et al., 2004; Arestis et al., 2001; Levine & Zervos, 1998; Nugroho et al., 2019). Stock markets are important for the home economy as well as for the stock markets across the border (Chiang & Zheng, 2010; Hiang Liow, 2012; Lin et al., 2012; Neaime, 2012; Zhang et al., 2013). Developed stock markets impact their economy and the stock markets of developing and underdeveloped economies. Similarly if any global issue arises, stock market behaves in integrated way like in the case of Covid-19 (Chavali et al., 2021). Extensive studies have concluded that stock markets are correlated across borders, and the performance of one stock market impacts the rest of the stock market. Stock market correlation (SMC) or integration is sensitive to many factors (Arestis et al., 2001; Bracker et al., 1999; Chavali et al., 2021; Dorodnykh, 2014b; Engelberg & Parsons, 2011; Eun & Shim, 1989; Ferguson et al., 2015; Johnson & Soenen, 2003; Levine & Zervos, 1998; Narayan et al., 2004; Panda, 2015; Tetlock, 2007)

Ferguson et al. (2015) found that the tone and volume of firm-related news provide sufficient information about future stock returns. They worked on UK media from 1981 to 2010 and found that tone and volume predict next period abnormal returns. A news-based trading strategy statistically returns from 14.2 to 19 basis points. The same impact may be found in stock markets if the media talks about policy-related news. To further quantify the news related to economic policies, Baker, Bloom, and Davis (2016) developed an Index called Economic Policy Uncertainty Index (EPU Index).

Some studies have found the impact of media on stock exchanges using economic policy uncertainty in the context of developed and developing countries (Antonakakis et al., 2013; Dash et al., 2021; Ghirelli et al., 2021; Kang & Ratti, 2013; Ma et al., 2022; Pastor & Veronesi, 2012; Pástor & Veronesi, 2013; Youssef et al., 2021). The literature has concluded that Economic Policy Uncertainty (EPU) is a significant factor in determining the performance of stock markets (Al-Thaqeb et al., 2022; Chiang, 2021; Dash et al., 2021). In the literature, the leading newspaper bases economic policy uncertainty (EPU) index, developed by Baker et al. (2016) has been used extensively to measure its impact on stock returns. Literature supports the stock market correlation of BRIC countries among themselves and with the rest of the world. However, the

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EPU of developed countries has not been used to measure their impact on regional, neighboring, or developing countries. This paper updates the literature by exploring EPU as a significant factor impacting cross borders stock markets correlation.

In literature, substantial work has been done on stock market correlation and comparatively less on determinants of stock market correlation. Many scholars have found the significant stock market correlations across world stock exchanges and among national stock exchanges (Arestis et al., 2001; Bracker et al., 1999; Dorodnykh, 2014b; Eun & Shim, 1989; Johnson & Soenen, 2003; Levine & Zervos, 1998; Narayan et al., 2004; Panda, 2015). Dorodnykh (2014a) shows that financial harmonization, cross-membership agreements, for-profit corporate structure, trading engine, and regional integration are important drivers of stock exchange integration.

Roll (1992) find that the industrial composition of national stock indices is a potential source of international co-movements of stock exchanges. A study by Bracker et al. (1999) documents that stock exchanges integrate at the international level due to macroeconomic variables, i.e., bilateral trade. Johnson & Soenen (2003) and Yu et al. (2010) provide evidence of positive cointegration among Asian and USA stock markets. Chiang & Zheng (2010) found herding behavior in global markets and concluded that crises trigger herding behavior in the crisis-originating country, spreading this behavior to neighboring countries. Stock volatilities and global crises are a factor causing covariance among the real estate stock markets (Hiang Liow, 2012). Working on the influence of financial development and international trade correlation on stock market integration, Vithessonthi & Kumarasinghe (2016) show that a country's financial development positively affects its stock market correlation with the world's stock market.

An & Brown (2010) measured the correlation of BRIC countries with the USA stock market. They took the monthly and weekly indexes of the USA, Brazil, Russia, India, and China from 1995 to 2003. Dimitriou et al. (2013) found that the correlation between BRICS and USA stock markets has increased since early 2009, which is stronger in bullish compared to bearish periods. The correlation between stock markets is extensively studied in the literature (An & Brown, 2010; Arestis et al., 2001; Bhar & Nikolova, 2009; Eun & Shim, 1989; Johnson & Soenen, 2003). Stock market correlation has been studied by different variables like financial development and bilateral trade agreements (Vithessonthi & Kumarasinghe, 2016). We have studied it uniquely and innovatively via the Economic Policy Uncertainty Index developed by Baker et al. (2016).

Economic policy is a set of tools and actions that a government follows to improve its economy, which includes changing the interest rates, tax rate, spending decisions, and achieving a high employment rate and low inflation rate. An effective economic policy is necessary to sustain a country in this world. Countries devise economic policies to achieve maximum benefits via foreign direct investment or to create an attractive opportunity for international investors. Uncertainty in any country's economic policy impacts its correlation with the rest of the world in the shape of trade agreements, exchange rates, and even stock market correlation. The economic policy also has a direct effect on the country's stock markets.

Media is a significant predictor of stock returns; it is necessary to measure the impact of media on stock market correlations of developing countries with developed countries' stock exchanges. This will reduce portfolio risk through diversification; the interests of investors rely on the weak correlation among stock markets. The benefits of international diversification depend on the extent to which different stock markets are correlated. So, this study recommends that investors in portfolio formations with a strong correlation will reduce diversification and lower portfolio returns.

In this study, we focused on measuring the impact of the Economic Policy Uncertainty of BRIC and the USA on the correlation of BRIC with the USA and the World MSCI index. Stock markets are integrated and measuring the impact of developed economies' economic policy uncertainty on the performance of developing economies is our contribution to the literature. Further, we measured this impact in both the long and short runs. We also contributed by providing the adjustment rate of any shock in the long run. We used the EPU index of the USA and BRIC to measure their impact on correlations of stock exchanges of BRIC countries with developed countries.

First, this study contributes to the literature by using EPU of developed countries as a predictor of correlation between developed and developing countries, which is missing in the literature. Secondly, the EPU of BRIC is also used as a predictor of such stock market correlation. Although the literature supports the direct impact of EPU on stock markets, it is the very first time indirect impact is measured, i.e., on correlation. Thirdly, this study measures the impact of EPU both in the short and long runs. Fourthly, this study also measures the adjustment rate to the equilibrium, which is lacking in the literature.

Many studies have explored the association between Economic Policy Uncertainty (EPU) with stock markets directly (Oliyide et al., 2021; Su et al., 2021), but there is a lack in the literature where EPU of an individual country is investigated as the determinant of its stock market correlation with other developed economies for diversification opportunities. The study finds a positive and significant short-run as well as the long-run impact of Russia's and the US's EPU on their stock markets. In other words, as the EPU of the USA increases, the correlation of BRIC with the USA Stock Market and the World Stock Market increases, suggesting minimum diversification opportunities for the investors. The study also recommends that investors diversify their portfolios by considering cross borders assets avenues to gain maximum returns and reduce portfolio risk.

METHODS

Based on the availability of the data and objectives of the study, we used the monthly data of stock market returns for the four emerging markets, i.e., BRIC countries, which include Brazil, Russia, India, and China. The starting date of each country is matched with the availability of the EPU index. The starting period for Brazil is May 1993, for Russia is September 1995, for India in January 2003, and for China in January 1995.

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The stock market data is obtained from the Bloomberg database. The monthly EPU index of BRIC, as developed by Baker et al. (2016), is obtained from www.policyuncertainty.com. The literature-supported determinants of stock market correlation are used as the control variables, which include GDP growth, Financial Openness, and Interest Rate Spread (Vithessonthi & Kumarasinghe, 2016).

Economic Policy Uncertainty (EPU) index measurement is developed by Baker et al. (2016). In this method, the frequency of articles is calculated in leading newspapers of countries for a different combination of words, i.e., "economic" or "economy"; "uncertain" or "uncertainty"; and one or more of "Deficit," "Federal Reserve," "legislation," "regulation." This index rises when any fiscal decision or economic policies change or develop. EPU of USA is developed by covering ten large newspapers in the USA, which include USA Today, the Miami Herald, the Chicago Tribune, the Washington Post, the Los Angeles Times, the Boston Globe, the San Francisco Chronicle, the Dallas Morning News, the New York Times, and The Wall Street Journal (Baker et al., 2016). A normalized index of the volume of the news article is developed, which discusses economic policy uncertainty. We used a newspaper-based economic policy uncertainty index for this study. However, this measure may raise the issues of newspaper liability, bias, accuracy, and consistency. For verification, other measures are taken, which include this index compared with other measures of economic uncertainty. Other economic policy measures include light-leaning and left-leaning newspapers and the frequency of usage of world economic policy by the Federal Reserve System. As mentioned by the author, an audit is also conducted to cross-check the frequency of words in measuring economic policy uncertainty.

Russian EPU index is measured by using only one newspaper because of restrictions on the press by Government. India EPU is calculated by finding specific words in newspapers, including Economic Times (2003), Times of India (2003), Hindustan Times (2004), The Hindu (2003), Financial Express (2003), and Indian Express (2003). For China, the South China Morning Post was searched by Proquest. In the case of Brazil, the newspaper Folha de Sao Paulo is used for the said index. To develop this index, number of articles containing the terms "incerto" or "incerteza", "econômico" or "economia", and one or more of the following policy-relevant terms: regulação, déficit, orçamento, imposto, banco central, alvorada, planalto, congresso, senado, câmara dos deputados, legislação, lei, tarifa are counted. To incorporate the change of articles with time, a raw count of articles containing these words is divided by the no of total articles in that newspaper and the same month. Then the series is normalized for each newspaper to get the unit standard deviation from starting month onward. These normalized values obtained from multiple papers are summed to get an index. As the last step, this series is again normalized on the average value of 100 from the starting month. This same method is followed in all countries with an EPU index (Baker et al., 2016).

The dynamic conditional correlations are calculated in the first stage using the DCC-GARCH model. Engle (2002) developed the Dynamic Conditional Correlation (DCC) Generalized Autoregressive Conditional Heteroscedasticity (GARCH) model to

measure the changing correlations and volatilities in financial markets. As specified in the DCC-MGARCH model, it is based on return series $r_{i,t}$ with time-varying covariances, variances, and means for stock market *i* at time *t* (Lean and Teng (2013). The main equation of the DCC GARCH model is given below for two stock market returns.

$$r_{i,t} = \mu_{i,t} + \varepsilon_{i,t}, \text{ and } \mu_{i,t} = E\left(r_{i,t}|\Psi_{t-1}\right) = E_{t-1}\left(r_{i,t}\right), \varepsilon_{i,t}|\Psi_{t-1} \sim N(0, H_t).$$

The symbol Ψ_{t-1} indicates the information given in the last period. The above expression $H_t = D_t R_t D_t$ shows the conditional variance-covariance matrix H_t, also known as a conditional correlation estimator. D_t indicates the (n x n) diagonal matrix of conditional standard deviations at time *t*, which is time-varying.

The correlation estimator $\rho_{ij,t}$ for DCC (1, 1) is estimated as follows:

$$\rho_{ij,t} = \frac{(1-\alpha_{DCC}-\beta_{DCC})\bar{q}_{ii} + \alpha_{dcc}\varepsilon_{i,t-1}\varepsilon_{j,t-1} + \beta_{dcc}q_{ij,t-1})}{\sqrt{(1-\alpha_{DCC}-\beta_{DCC})\bar{q}_{ii} + \alpha_{dcc}\varepsilon^2_{i,t-1} + \beta_{dcc}q_{ii,t-1})((1-\alpha_{DCC}-\beta_{DCC})\bar{q}_{jj} + \alpha_{dcc}\varepsilon^2_{j,t-1} + \beta_{dcc}q_{jj,t-1})}}$$

The coefficient of $\rho_{it,t}$ specifies the power of correlation, whereas its sign shows the direction of correlation.

After calculating the correlation series, we employ the Autoregressive Distributed Lag (ARDL) model developed by Pesaran, Shin, and Smith (2001). ARDL model incorporates the variables which are not stationary at the same level, i.e., few are stationary at level but others at first difference. If a variable is stationary at the level, then we can use simple OLS, but issues arise when the variables under study are stationary at different levels. In our data, some variables are stationary at level and others at the 1st difference.

ARDL model can help derive the dynamic error correction model (ECM) (Banerjee et al., 1993), where ECM integrates the short-run relationship with the long-run equilibrium relationship where integration would not cause any long-run information to be lost. The following model is selected per AIC criteria for the bound testing approach.

$$\begin{aligned}\Delta SMC_{ij,t} = a_0 &+ \sum_{i=1}^{n1} b_i \Delta SMC_{ij,t-i} + \sum_{i=0}^{n2} c_i \Delta EPU_{i,t-i} + \sum_{i=1}^{n1} d_i \Delta USAEPU_{ij,t-i} + \sum_{i=0}^{n3} f_i \Delta GDP_{i,t-i} + \sum_{i=0}^{n4} g_i \Delta InterestSpread_{i,t-i} \\ &+ \sum_{i=0}^{n5} h_i \Delta FDI_{i,t-i} \sum_{i=0}^{n5} k \Delta GFC_{i,t-i} + \alpha_1 SMC_{ij,t-1} + \alpha_2 EPU_{i,t-1} + \alpha_3 USAEPU_{i,t-1} + \alpha_4 GDP_{i,t-1} \\ &+ \alpha_5 InterestSpread_{i,t-1} + \alpha_6 FDI_{i,t-1} + \alpha_7 GFC_{i,t-1} + e_t\end{aligned}$$

$\Delta SMC_{ij,t}$ is a change of stock market correlation calculated by the DCC-GARCH method between country i and j. $\Delta EPU_{i,t-i}$, $\Delta GDP_{i,t-i}$, $\Delta InterestSpread_{i,t-i}$ and $\Delta FDI_{i,t-i}$ change of EPU, GDP growth, Interest Spread, and FDI of i country. We have also included EPU of the USA while measuring the impact of BRIC countries on their correlation with the World MSCI.

After estimating the lag length using AIC criteria, this paper calculates the long-run relationship using the ARDL bounds test. In our given model, the null hypothesis for the bound test is H_0: $\alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 = 0$, to negate the long-run relationship against the alternative hypothesis, which states a long-run relationship.

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RESULT AND DISCUSSIONS

The results of the study are discussed in this section. Table 1 provides summary statistics of the macroeconomic variables, and Table 2 provides summary statistics of the correlation between BRIC, USA, and the World MSCI index using the DCC-GARCH model.

Table 1. Summary Statistics for Key Variables

Variable	Mean	Median	S.D.	Min	Max	Obs.
EPU Brazil	137.97	115.27	90.38	12.69	676.96	344
EPU Russia	128.62	110.80	64.20	44.78	503.96	316
EPU India	91.41	78.72	49.67	23.35	283.69	228
EPU China	207.45	117.58	214.79	9.07	970.83	324
FDI Brazil (Mln)	-34400	-27700	26300	-94500	12300	344
FDI Russia (Mln)	3210	-188	12500	-21700	45300	316
FDI India (Mln)	-22300	-23300	14100	-55100	-2330	228
FDI China (Mln)	-89400	-69600	67800	-272000	50200	324
GDP Brazil	2.42	2.45	2.98	-4.55	12.50	344
GDP Russia	2.85	3.05	4.53	-8.84	11.89	316
GDP India	6.26	7.25	3.95	-7.79	23.65	228
GDP China	8.75	8.59	2.37	1.78	14.67	324
INTSPRD Brazil	36.54	35.90	9.40	18.61	58.71	300
INTSPRD Russia	8.25	6.19	6.37	2.98	27.04	300
INTSPRD China	3.01	3.01	0.49	0.51	3.76	324

Table 1 reports summary statistics for the key variable from a sample of 4 countries over 1993M5-2021M12. EPU used in this study is obtained as in Baker et al. (2016). Financial openness is measured as the foreign direct investment (FDI) ratio to GDP (in %). ΔGDP is the GDP growth rate (in %), computed as the first difference in the natural logarithm of real GDP in millions of US dollars (at constant 2005 prices). INTSPRD is computed as the difference between the deposits interests rate for country i and the US money market rate. Interest Spread in India is unavailable, so this variable is not used in relevant Models. China has the highest volatility in the EPU index, with a standard deviation of 214.79, while India has the lowest variation of EPU i.e., 49.67. In the same way, EPU of China has highest mean of 207.45 and India has the lowest which is 91.41. Russia has the highest FDI mean of $3,210 million during the study period while China has the lowest which is $894,00 million. GDP growth average is highest in case of 8.75% being the fast-growing economy while Brazil is the slow growing economy with GDP growth of 2.42% per year.

Table 2. Summary statistics for correlations coefficients

Correlation Coefficients	Mean	Median	S.D.	Min	Max	Obs.
USA and BRZ	0.53	0.57	0.14	0.11	0.76	343
USA and RSS	0.47	0.46	0.15	0.08	0.74	315
USA and IND	0.56	0.57	0.07	0.33	0.77	227
USA and CHN	0.26	0.25	0.10	0.06	0.45	323
World and BRZ	0.60	0.66	0.14	0.24	0.80	343
World and RSS	0.54	0.54	0.16	0.17	0.83	315
World and IND	0.61	0.62	0.06	0.40	0.78	227
World and CHN	0.29	0.29	0.10	0.07	0.48	323

Table 2 shows the summary statistics for dynamic conditional correlations of BRIC countries with USA and World, which the DCC-GARCH Model calculates. These include the period from 1993M5 to 2021M12 and are calculated monthly. All the BRIC countries positively correlate with the USA and World, ranging from 0.26 to 0.60. Brazil has the highest mean correlation (0.60) with World, while India has the highest mean correlation (0.56) with the USA. China has the lowest stock market correlation with the USA (0.26) and World (0.29). The minimum correlation between China and the USA and the World may be due to its unique international policies and governance.

Figure 1. The DCC- GARCH-based Correlations of the USA Stock Market with the Member Countries of the BRIC Block

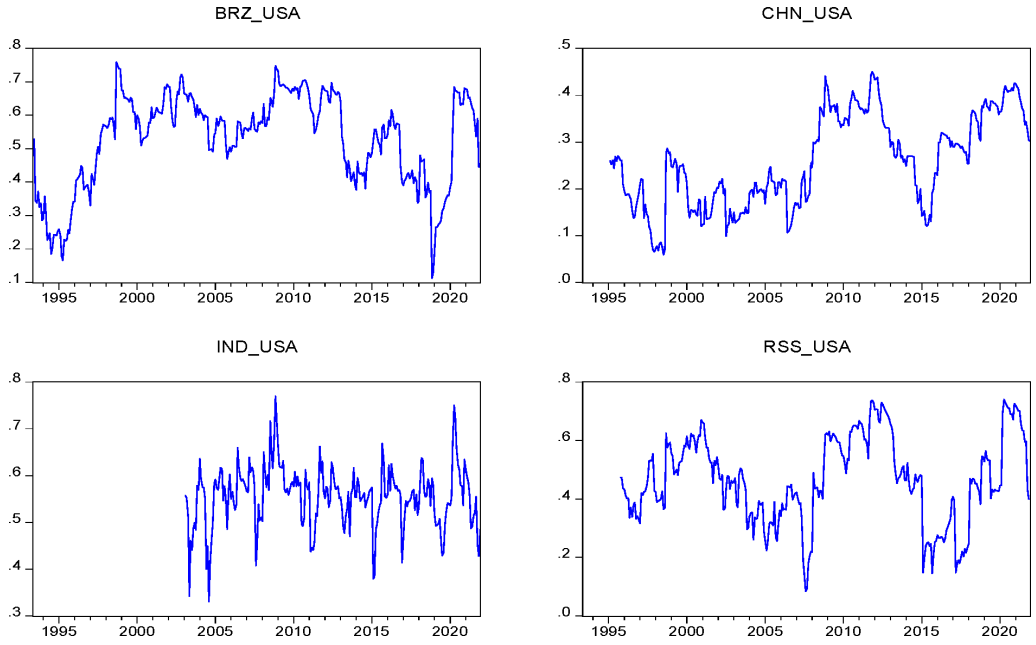

Figure 1 and Figure 2 present the dynamic conditional correlation graphs of individual countries with the USA and the World. Figure 3 exhibits the plots of EPU

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of each country. It can be seen that the EPU spiked during the global financial crisis period in 2008, due to which the Global Financial Crises (GFC) dummy was used. The same spikes can be observed during Covid-19.

Figure 2. The DCC- GARCH-based Correlations of the MSCI World Index with the Member Countries of the BRIC Block

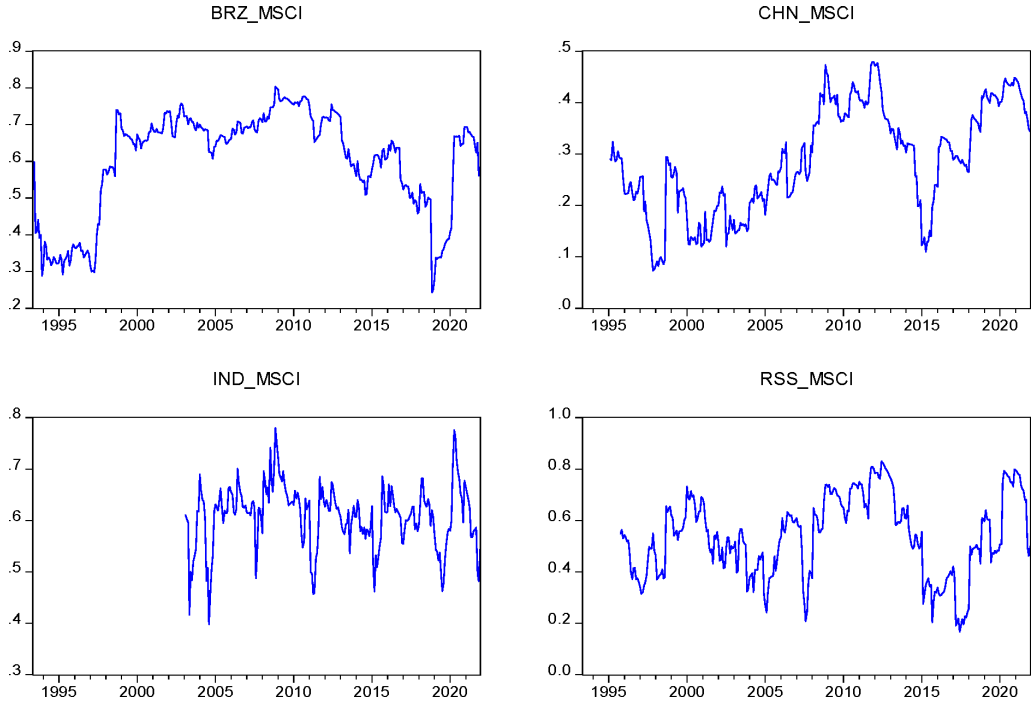

Figure 3. The Economic Policy Uncertainty (EPU) Data Series

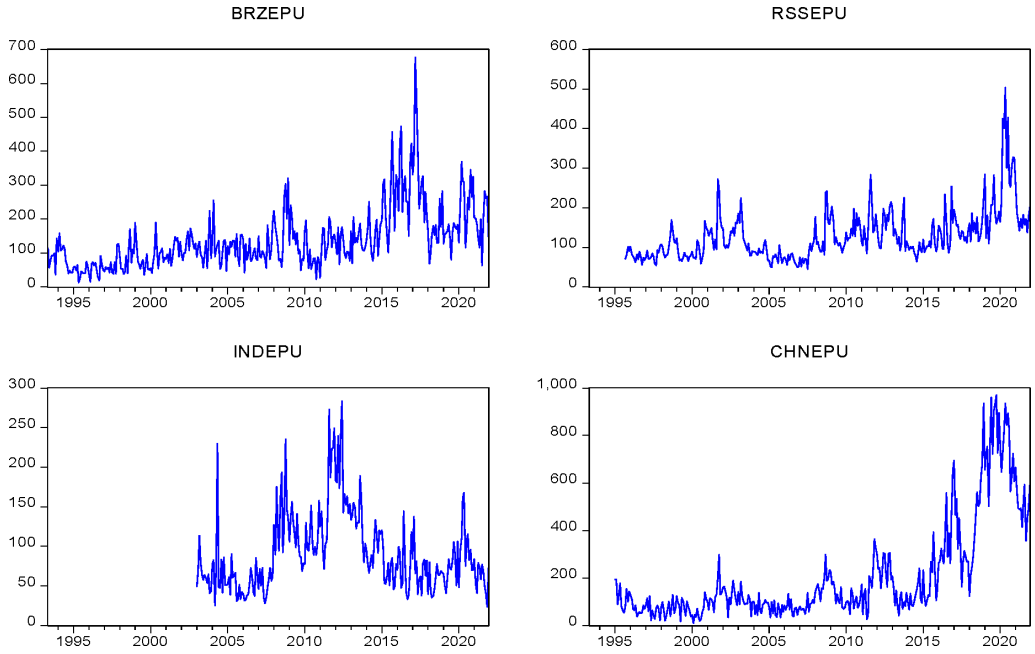

Table 3. The long-run Relationship Among SMC of BRIC Countries with the USA.

Stock Market Correlation	Model AIC Criterion	F Statistics	Lower bounds I(0)	Upper bounds I(1)	Level of Significance
USA and BRZ	(1,0,2,4,2,3,0)	2.85**	2.56	4.05	<1%
USA and IND	(1,0,4,0,2,1)	9.495***	3.06	4.15	<1%
USA and RSS	(1,1,0,0,0,0,1)	4.24**	2.66	4.05	<1%
USA and CHN	(1,0,1,2,0,0,1)	3.08***	2.66	4.05	<1%

Table 3 and Table 4 represent the results of ARDL models where Stock Market Correlation is the dependent variable, and a set of independent variables is used. We examine the hypothesis "Economic policy uncertainty of the USA and home country affects stock market correlation of BRICS with USA and World stock markets." We expect each country's EPU to impact its correlation with the USA and World stock markets. In Table 3, the results for the ARDL model are given. The dependent variable is a stock market correlation (SMC) of each country with the USA, computed for each country using the DCC-GARCH model. The bound tests and F-statistics show that via the DCC-GARCH approach EPU of Brazil, India, Russia, and China has a long-run relationship with the USA.

Table 4. The long-run Relationship among SMC of BRIC Countries with the World

Stock Market Correlation	Model AIC Criterion	F Statistics	Lower bounds I(0)	Upper bounds I(1)	Level of Significance
World and BRZ	(1,0,4,0,2,0,0)	2.03*	1.75	2.87	<10%
World and IND	(1,4,4,3,2,1)	5.85***	3.06	4.15	<1%
USA and RSS	(1,2,1,0,0,2,1)	2.46**	2.32	3.59	<2.5%
World and CHN	(1,0,1,2,0,0,1)	2.72**	2.66	4.05	<1%

Table 4 presents the results of the ARDL bounds testing approach for a sample of 4 countries over maximum periods for each country. The dependent variable is a stock market correlation (SMC) of each country with World, computed for each country and each month using the DCC-GARCH model. At the same time, in Table 4, we show that via the DCC-GARCH approach EPU of Brazil, India, Russia, and China has a long-run relationship with the World MSCI index. There is hardly any study where EPU is used as a predictor of stock market correlation, so we rely on the other studies where correlation is explored and confirmed. The results of our study confirm the findings of the researcher where the association between developed and developing countries is explored (An & Brown, 2010; Bracker et al., 1999; Chiang & Zheng, 2010; Dimitriou et al., 2013; Hiang Liow, 2012; Vithessonthi & Kumarasinghe, 2016). We are contributing to the literature by providing an additional determinant of this cointegration: EPU. This study confirmed the impacts of EPU of USA and BRIC countries on their correlation

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with the USA and World stock market. It means that whenever USA/BRIC countries change their economic policies, the correlation between BRIC, USA, and the World Stock Market increases.

Table 5. The Long-run and Short-run Coefficient of SMC of BRICs with the USA

Dependent Variables	Brazil	Russia	India	China
Short Run Coefficients				
SMC (-1)	-0.070***	-0.102***	-0.390***	-0.078***
EPU	0.0001	-	0.000	0.000
EPU(-1)	-	0.0001***	-	-
USAEPU	-	0.0001	-	-
USAEPU(-1)	0.0001***	-	0.000**	0.0001***
GDPG	-	0.001	-	-
GDPG(-1)	0.001		-0.004***	0.001
GDPG	-	0.001	-	-
FDI	-	0.0001	-	-
FDI(-1)	0.0001		0.000	0.000
INTSPRD	-	0.002***	-	-
INTSPRD(-1)	0.001**	-	-0.016	-0.001
GFC**	0.001	-	0.281	-
GFC(-1)	-	-0.007		-0.005
D(GFC)	-	0.052	0.103***	0.037**
D(EPU)	-	0.0001	-	-
D(EPU(-1))	-	-	-	-
D(USAEPU)	0.0001	-	0.0001	0.0001
D(USAEPU(-1))	0.0001	-	0.0001***	
D(GDPG)	0.002	-	-	-0.002
D(GDPG(-1))	0.006	-	-	-0.011*
D(GDPG(-2))	-0.012**	-	-	-
D(GDPG(-3))	-0.008*	-	-	-
D(FDI)	0.0001	-	0.0001	-
D(FDI(-1))	0.0001***	-	0.0001***	-
D(INTSPRD)	-0.002	-	-	-
D(INTSPRD(-1))	0.012**	-	-	-
D(INTSPRD(-2))	-0.008*	-	-	-
CointEq(-1)	-0.070***	-0.101***	-0.390***	-0.078***
Long Run Coefficients				
Country's EPU	0.0001	0.003***	0.0001	0.0001
USAEPU	0.002***	0.0001	-0.001**	0.001***
GDP	0.012	0.009	-0.011***	0.014
FDI	0.0001	0.0001	0.0001	0.0001
INTSSPRD	0.009***	0.015***	-	-0.008
GFC	0.018	-0.065	-0.041	-0.067

*, **, and *** indicates significance at 10%, 5%, and 1% respectively.

Table 5 presents the results of a long-run as well as the short-run impact on the correlation between the USA and BRIC countries. Earlier studies on the stock markets confirm the integration of stock markets due to some macroeconomic variables, financial developments, and herding behavior (An & Brown, 2010; Bracker et al., 1999; Chiang & Zheng, 2010; Dimitriou et al., 2013; Hiang Liow, 2012; Vithessonthi & Kumarasinghe, 2016). But this study confirmed that EPU is also a significant variable impacting the integration levels of the stock markets. EPU of the USA is found to significantly impact the integration of BRIC countries with the USA Stock Market except for India in the long run. However, individual EPU of the country is found to be impacting insignificantly for BRIC except for Russia in the long run. The EPU of Russia impacts more on its correlation with the USA than the EPU of the USA. The USA is one of the biggest economies that dominate the impact of individual countries' EPU, but this is not true for Russia. Whenever the Economic policies of the USA are changed, this impacts its correlation with BRIC increases. So, the uncertainty spillover impact of the USA is observed among the BRIC countries except for Russia. Similar findings are observed in the short-run relationship. So in the period of higher uncertainties, stock markets are correlated higher, as seen during GFC and Covid-19. Diversification becomes useless in global crisis periods.

Table 6 presents the results of a long-run as well as the short-run impact of USA EPU on the correlation (SMC) of BRIC countries with the World MSCI Index. We find that the EPU of Brazil, India, and China are insignificant predictors of their stock market correlations with the World MSCI Index, while this is not true for Russia. However, the EPU of Russia impacts its correlation with the World MSCI Index instead of the USA EPU. In the short run, it is also evident that EPU of the USA impacts significantly and positively the correlation between Brazil, China, and India only. The association is positive, i.e., as the economic policy of the USA increases, the BRIC countries get closer to the USA market to avoid losses. Moreover, the investors follow the trends, i.e., changes in USA policy uncertainty may change the outcomes in BRIC markets, and so integration among the markets increases.

The Russian stock market is independent of the policy uncertainties in the USA. The investors in Russia possibly behave differently compared to China, India, and Brazil as this is a novel study where correlation among the stock markets is considered, but the same results are found in the case of the correlation between oil and stock markets in the USA (Fang et al., 2018). These findings are also consistent with the crisis period, where stock markets tend to perform closer in times of financial crisis (Liu & Zhang, 2015). Similar findings are confirmed by Xiong et al. (2018) in the context of Chinese stock exchanges. They also used the DCC-GARCH model for correlations. In the same way, Asgharian et al. (2016) studied the impact of EPU on UK-USA stock markets correlation and confirmed the association. The findings of this study extended the literature by providing a research gap in the context of BRIC countries.

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Table 6. The Long-run and Short-run Coefficient of SMC of BRICs with the World

Dependent Variables	Brazil	Russia	India	China
Short Run Coefficients				
SMC (-1)	-0.032***	-0.067***	-0.273***	-0.075***
EPU	0.000	-	0.000	0.000
EPU(-1)	-	0.0001***	-	-
USAEPU(-1)	0.000**	0.0001	0.000	0.000**
GDPG	-0.001	0.001	-0.002**	0.002**
GDPG(-1)	0.001	-	-	-
FDI	0.001	0.0001	-	-
FDI(-1)	0.000**	-	0.0001	0.000
INTSPRD**	0.0001*	-	-	-0.002
GFC**	0.002	-	-	-
GFC(-1)	-	-0.010	-0.018**	-0.004
D(EPU)	0.0001	0.0001	0.0001	-
D(EPU(-1))	0.0001**	0.0001	0.0001	-
D(EPU(-2))	-	-	0.0001	-
D(EPU(-3))	-	-	0.0001**	-
D(USAEPU)	0.000	0.0001*	0.0001	0.0001
D(USAEPU(-1))	0.000***	-	0.0001**	-
D(USAEPU(-2))	0.000*	-	0.0001**	-
D(USAEPU(-3))	0.000	-	0.0002**	-
D(FDI)	0.000		0.0001	
D(FDI(-1))	0.000	-	0.0001***	
D(GDPG)	0.001	-	0.007	0.000
D(GDPG(-1))	0.000	-	-0.010*	-0.012*
D(GDPG(-2))	-0.005	-	-0.006	-
D(GDPG(-3))	-0.006*	-	-	-
D(GFC)	-	0.050	0.094***	0.032*
D(INTSPRD)	-	-0.027*	-	-
D(INTSPRD(-1))	-	0.032**	-	-
Coint. Eq(-1)	-0.032***	-0.098***	-0.273***	-0.075***
Long Run Coefficients				
EPU	0.0001	0.003***	0.0001	0.0001
USAEPU	0.002**	0.0001	0.0001	0.001**
GDP	0.017	0.019	-0.009**	0.021**
FDI	0.0001	0.0001	0.0001	0.0001
INTSPRD	0.010**	0.016**	-	-0.023
GFC	0.053	-0.155	-0.066**	-0.059

*, **, and *** indicates significance at 10%, 5%, and 1% respectively.

Based on the ARDL model, our findings suggest that the Economic Policy Uncertainty of Brazil, India, and China are positively correlated with the stock market of the USA and the World, while the EPU of Russia is uncorrelated. Further. The

only exception is the Russia and USA SMC that has no relation with any independent variables. On average, results imply that economic policy uncertainty would increase the stock market correlation of BRIC countries with the USA and the World.

To check the model goodness of fit of the ARDL model, we have applied Q statistics that is used for serial correlation and the cumulative sum of recursive residuals (CUSUM) along with the cumulative sum of squared recursive residuals (CUSUMSQ) for model stability tests. Figure 4 to Figure 11 shows the results of CUSUM and CUSUM of Square test results for only those models where F statistics are significant, i.e., long run, and the short-run relationship among variables is significant. We found no serial correlation issue in this data except partial effects in the case of Brazil and India. Further, stability test results show that the model is stable, and there are no structural breaks except in 2008 due to global financial crises. We incorporated the GFC era as a dummy variable and found it only significant in the short run.

Figure 4. CUSUM and CUSUM of Squares of ARDL models for Brazil and the USA

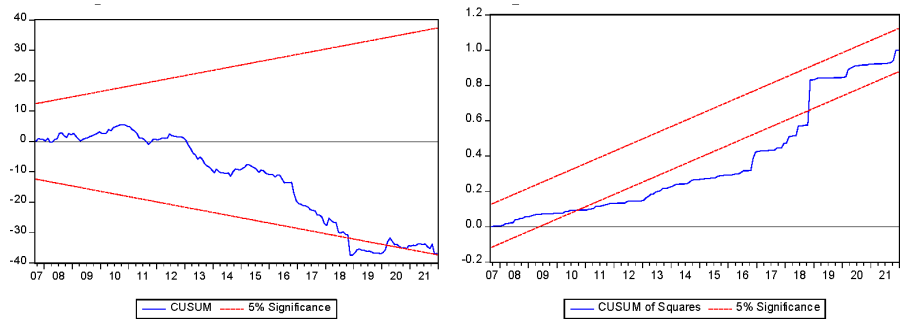

Figure 5. CUSUM and CUSUM of Squares of ARDL models for Brazil and the World

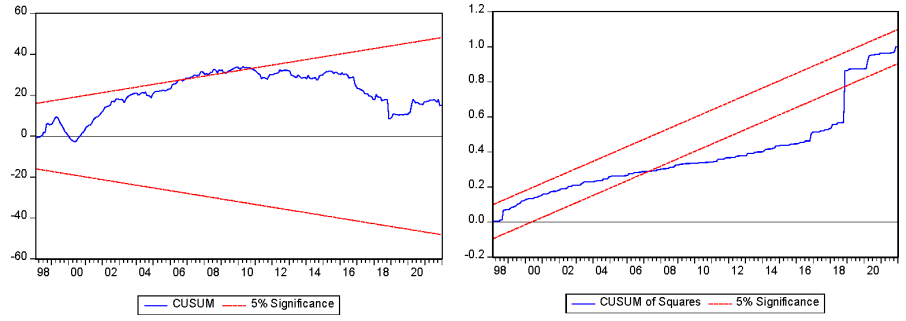

Figure 6. CUSUM and CUSUM of Squares of ARDL models for India and the World

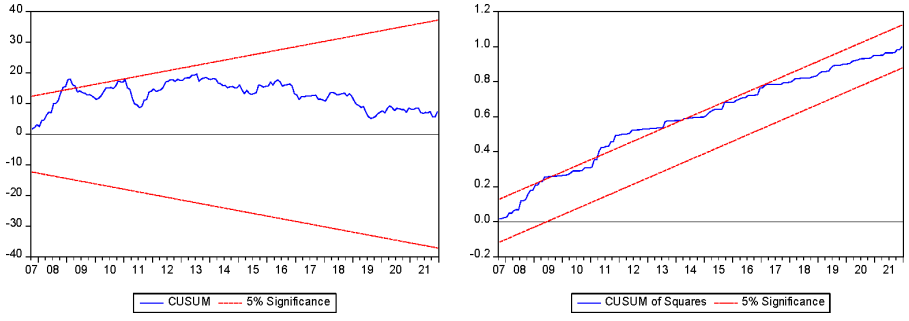

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Figure 7. CUSUM and CUSUM of Squares of ARDL models for India and the USA

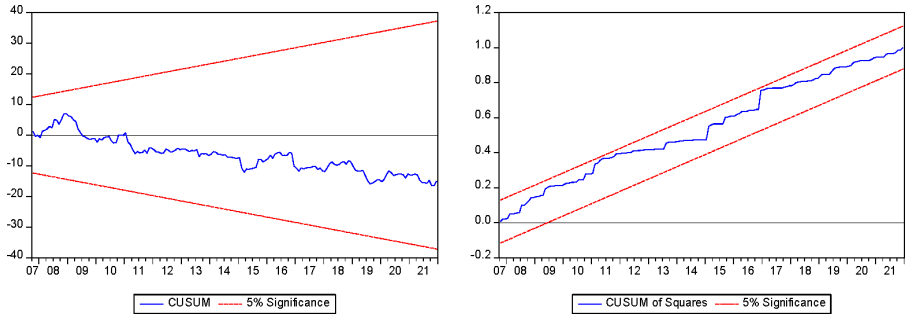


Figure 8. CUSUM and CUSUM of Squares of ARDL models for Russia and the World

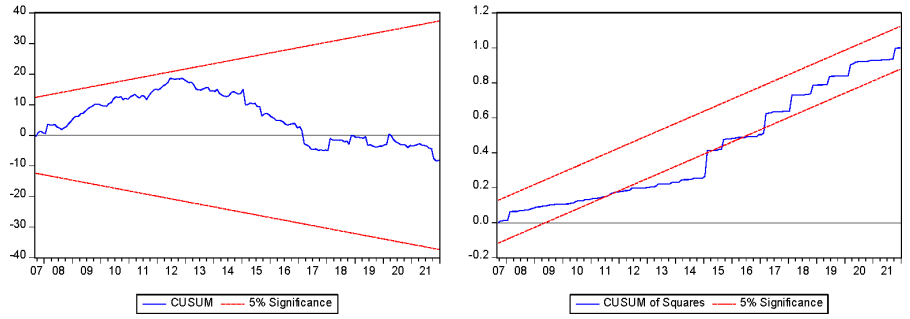


Figure 9. CUSUM and CUSUM of Squares of ARDL models for Russia and the USA

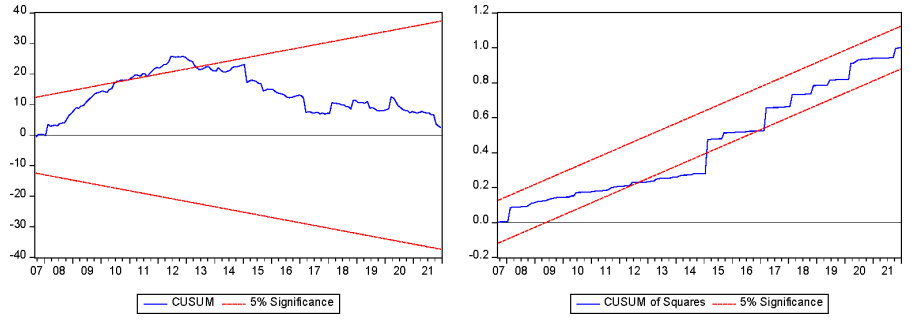


Figure 10. CUSUM and CUSUM of Squares of ARDL models for China and the USA

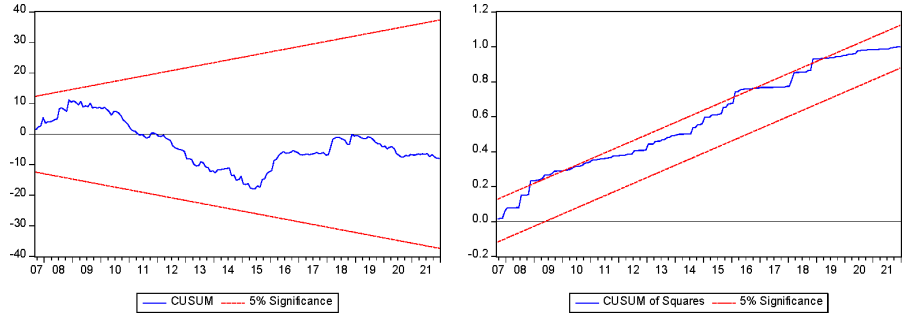
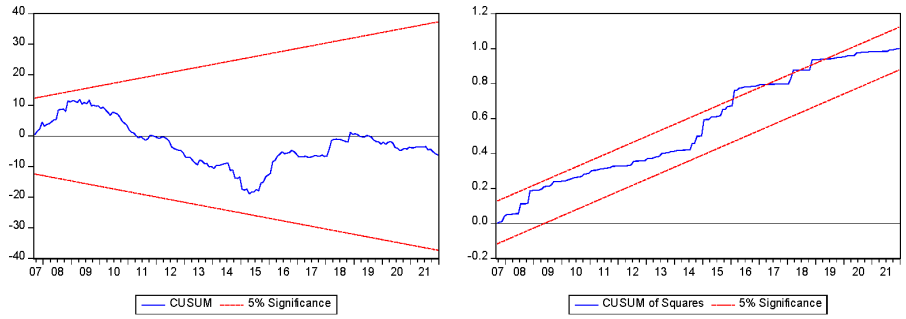


Figure 11. CUSUM and CUSUM of Squares of ARDL models for China and the World



The study has contributed to the existing literature in many ways. Firstly, we have contributed to the literature by providing a new direction to investors using the EPU Index to measure the impact on correlations of developed and BRIC countries' stock exchanges. This is important for the investor to diversify their portfolio formation across borders to gain maximum returns. This is also important for policymakers to avoid negative impacts on developing stock markets due to the fast switching of economic policy-related decisions in developed countries. Secondly, this study has used the EPU Index very first time to the best of our knowledge on said correlation, especially in the BRIC context. Thirdly, we have employed the DCC-GARCH model and Auto-Regressive Distributed Lag (ARDL) by incorporating maximum lags as per Akaike Information Criterion (AIC), which was developed by Akaike (1998) and found that EPU impacted significantly on this correlation.

CONCLUSION

This study tests whether the EPUs and World MSCI impact BRIC stock markets' correlation with the USA by using the DCC-GARCH approach, while ARDL bound testing approaches were utilized to measure the association of BRIC with the USA and World MSCI Index. The need for this investigation is ingrained in increasing economic and financial dependence among countries, which results in contagion effects, as evidenced in the global financial crisis. These crises result from policy disputes and fiscal and monetary policy uncertainties arising from political regime changes.

The findings suggest that EPU of the USA has a significant long-run and short-run relationship with BRIC, except for Russia. The stock market of Russia is found to behave differently than the rest of the BRIC countries. These results have important implications for policymakers and portfolio managers as any change in the policy of the USA can influence not only the domestic stock but also the BRIC stock markets. This study can be extended in the future by analyzing the policy spillovers across developed and emerging markets.

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Environmental, Social, Governance and Firm Performance in Developing Countries: Evidence from Southeast Asian

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Abstract

Several studies primarily investigate the influence of environmental, social, and governance on firm performance in a developed country where markets have matured, and investors are aware of corporate social responsibility activities. Therefore, studies in developing countries are still rare and mixed. This study examines the effect of Environmental, Social, and Governance (ESG) information on firm performance in ASEAN developing countries. We observed companies in ASEAN developing countries (Indonesia, Malaysia, Philippines, Thailand, and Vietnam) during 2010-2020. The information on ESG score and ROA as a proxy for firm performance measures ESG. Regression test results showed that ESG has a positive effect on firm performance. We also found that three components of ESG, environmental, Social, and Governance, positively affect firm performance. Robustness test results showed that overall ESG information, environmental information, and social initiatives affect the firm's market performance (Tobin's Q). Research originality in this study proves that developing countries have a positive effect between ESG disclosure and company performance. ESG, in the long term, would build effective governance and increase shareholder value. The research implication is to suggest a company has ESG information due to empirical testing that ESG information enhances a firm operational and market performance.

Keywords:
sustainability; environment; corporate governance; social; firm performance

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INTRODUCTION

Enhancing firm performance is always a concern for companies. Several studies have tested the factors that can improve firm performance (Yoo & Managi, 2021; Qoyum et al., 2021; Bodhanwala & Bodhanwala, 2021; Bhaskaran et al., 2021; Alareeni & Hamdan, 2020), and one of them is environmental, social, and governance (ESG) information increase firm performance (Mohammad & Wasiuzzaman, 2021; Yoo & Managi, 2021; Alareeni & Hamdan, 2020). Sustainable value like ESG information is created by sustainable financial institutions focusing on long-term financial and economic benefits (Bhaskaran et al., 2021). Because of increasing stakeholder expectations, corporations must manage their societal impacts, including human rights, labor, and diversity. Therefore, corporate sustainability entails respect for universal principles in these areas and proactive support of a sustainability agenda. An interconnected environment nowadays is characterized by ESG, networks of people, organizations, and devices continuously interacting, conversing, and exchanging information in indicating information sharing, signaling, and brand value creation have evolved in the past decade (Lee et al., 2022). Qoyum et al. (2021) test firms in Indonesia and Malaysia, two emerging countries in ASEAN (Association of Southeast Asian Nations), reveals that firms labeled Islamic have better environmental and social performance but not governance performance.

A firm sustainability report is considered an effort of transparency and accountability that can measure the company's concern for sustainability (Kim et al., 2018). ESG does not only consider environmental and social factors but also involves aspects of corporate governance. This condition is because managers and stakeholders worldwide perceive that corporate governance is an issue along with encouraging global economic growth and significant growth (Singh & Gaur, 2009). In addition, governance can also be used to assist decision-making related to corporate governance (Singh & Gaur, 2013). Atan et al. (2018) define the three aspects of ESG, namely: environmental aspects related to nature protection, climate change, and environmental impacts resulting from business operations; social aspects related to issues such as equality, diversity in the workplace, human rights, and corporate social contribution; and governance aspects related to board independence, ownership structure, minority shareholder rights, fair treatment of shareholders, and transparency of company information. Environmental and social activity assessment indicators and management mechanisms are still crucial for businesses and other stakeholders (Abughniem et al., 2019).

The environmental aspect addresses many issues related to the business and community environment (e.g., CO2 emissions, energy consumption, energy efficiency policies, total waste, and emission reduction policies) (Alareeni & Hamdan, 2020). Several studies have shown a positive influence between the environment and firm value (Yoo & Managi, 2021; Qoyum et al., 2021; Alareeni & Hamdan, 2020).

The social aspect contains social information such as gender, number of employees, turnover ratio, human rights, product safety, the ratio in management, and the ratio of female employees (Alareeni & Hamdan, 2020). Yoo & Managi (2021) found that corporate social scores positively affect company performance. Companies are starting

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to realize and consider corporate social responsibility practices as a driver of company market performance (Alareeni & Hamdan, 2020).

The governance aspect reflects issues related to the corporate governance structure (such as board independence, corruption, bribery, reporting and management, and shareholder protection). Alareni & Hamdan (2020) find that higher governance practices improve and positively affect operational and market performance. Companies that adopt governance mechanisms will provide more helpful information to investors and other users of financial statements to reduce the asymmetry of information (Alareeni & Hamdan, 2020). The reputation of corporate social responsibility (CSR) is considered a valuable tangible resource that can provide long-term benefits for the company (Lourenço et al., 2014).

Providing disclosure on ESG aspects is essential to increase company value and show the company's resilience and sustainability (Melinda & Wardhani, 2020). Mohammad & Wasiuzzaman (2021) investigated the influence of ESG on firm performance in one of the ASEAN developing countries, Malaysia, and found that ESG improves firm performance. They said the company's disclosure of sustainability efforts could help efficiently manage its resources and increase its value. ESG factors tend to treat them either as a way to attract socially responsible asset owners or as a tool to reduce their portfolio companies' regulatory or reputational risks. Their finding claim that Malaysian firms that disclose their ESG efforts are found to generate long-term performance throughout this study.

Alareeni & Hamdan (2020) found that the higher disclosure of ESG enhances the firm's operations. This condition may be because the yearly variation of the ESG disclosure increases the positive image of firms and then performance. ESG performance could mitigate financial risk during a financial crisis (Broadstock et al., 2020). Buallay (2018) found that disclosing more information about ESG enhances a company's performance. Buallay (2018) also found in each pillar of ESG that the environment positively impacts firm performance, but social and governance disclosure negatively affects firm performance. It indicates that social disclosure develops because executive management and boards of directors work on social policies for their benefit (Buallay, 2018). If so, then three possible outcomes are that these policies result in costs to the banks, costs that are borne by stakeholders, which lower the market value (TQ), the equity (ROE), and the efficiency of assets (ROA) (Buallay, 2018).

Atan et al. (2018) showed that ESG does not affect firm performance. Bodhanwala & Bodhanwala (2021) also showed that corporate environmental performance has no significant effect on firm performance (ROA). They also found that corporate social performance has a negative effect on ROA. Meanwhile, corporate governance has a positive relationship with firm performance. Khan et al. (2021) found that green process innovation negatively affects returns on assets (ROA). This negative relationship is because the shift in processes and services requires enormous investment. Ruan & Liu (2021) found that corporate ESG activities significantly negatively impact firm performance in China. They assumed that in emerging market countries where ESG activities are inactive, the ESG information disclosure requirements for listed companies might evolve into a

severe cost burden, leading to a significant negative correlation between ESG ratings and firm performance.

Researchers studied the association between corporate social responsibility and financial performance primarily based in developed countries where markets are mature, and investors are well aware (Fahad & Busru, 2021). Studies in developed countries find that the positive association between performance and ESG disclosure is due to lower information risk associated with higher disclosure of ESG (Cormier & Magnan, 2007). Firms that engage in ESG disclosures in the developed market are associated with lower systematic market risks and idiosyncratic risks due to a lower possibility of litigation or adverse market reaction (Sassen et al., 2016). Fahad & Busru (2021) investigated the effect of CSR on firm performance of emerging markets listed in the BSE 500 index India and they found that the negative effect of CSR disclosure on firm profitability and firm value in India, this negative effect is mainly influenced by environmental disclosure score and social disclosure score.

A study suggests that ESG disclosures reduce information asymmetry and improve investors' perception and recognition of the firm's investment strategies (Fatemi et al., 2018). Contrast findings found by Ting et al. (2019) that emerging market firms had higher ESG initiatives regarding resource use, workforce, human rights, and CSR strategies. Besides that, they found that ESG initiatives might lead to significant improvements in firm valuation effects. Mohammad & Wasiuzzaman (2021) said that in an emerging market, value creation through integrating ESG in a firm's long-term strategy with the right vision would attract the best talent, build authentic customers via effective governance structure and increase shareholder value. Therefore, studies on ESG in emerging markets still need to be completed (Mohammad & Wasiuzzaman, 2021).

Baughn et al. (2007) mentioned that the diverse characteristics of a country have a significant role in explaining the CSR practice, like culture, population, and country's lifestyle. Bhatia & Makkar (2019) found that companies in developed economies give less priority to community issues, and companies in developing countries are producing CSR information either in annual reports or in separate stand-alone CSR reports, but it needs more reliability and transparency.

Due to the impact of the US-China trade war, thereby moving all or part of their production lines to Southeast Asia, ASEAN became an investment destination country. Investors need further information regarding business activities, not only limited to financial information but also non-financial information involving aspects, such as ESG (Atan et al., 2018). Emerging market countries like developing countries in ASEAN are still in the early stages of economic development to pay more attention to the scale and speed of economic growth and related financial indicators, which often lead to neglect of ESG issues (Ruan & Liu, 2021). This study investigates the influence of environmental, social, and governance information on firm performance in developing countries in ASEAN. This research contributes to the research context in ASEAN developing countries.

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Prior studies have examined the association between ESG and firm performance. Clark et al. (2015) mentioned that there are common types of ESG studies that have been published. The scholars have directly examined individual dimensions of ESG (e.g., governance), testing for correlations with firm performance, and claimed that 85 percent of ESG studies only examine one aspect of ESG and not all three aspects simultaneously. Another contribution of this research is that we investigated the ESG impact on firm performance and examined all three dimensions of ESG and its impact on firm performance.

METHODS

This study examines the effect of ESG and its components on firm performance in ASEAN: Indonesia, Malaysia, Philippines, Thailand, and Vietnam. This research uses data from 2010 until 2020. The research sample was taken based on the companies listed on the stock exchanges of each country and collected by the Thomson Reuters database. The final total of the research sample was 1418 observations per firm-year. Table 1 presents research sample information.

Table 1. Research Sample

Country	Freq.
Indonesia	338
Malaysia	488
Philippines	203
Thailand	384
Vietnam	5
Total	**1418**

Our research data is an unbalanced data panel. Research data was collected from the Thomson Reuters database, the company's website, and the website of the world bank. The dependent variable is the firm performance measured by firm profitability, namely return on assets (ROA) or the ratio of net income divided by total assets of book value (Buallay, 2018). ROA data were collected from the Thomson Reuters database. The independent variable of the study is ESG and each of its components, namely Environmental, Social, and Governance which is measured using ESG scores collected from the Thomson Reuters database (Velte, 2019).

The research uses leverage, firm size, firm age, and gross domestic product (GDP) control variables. Leverage is measured by the ratio of total debt to company equity. Leverage data is collected from the Thomson Reuters database. Company size is measured using the logarithm of the company's total assets. This data is taken from the Thomson Reuters database. The company's age is the length of the company since it was founded. Company age information is obtained from the website of each company. The control

variable GDP is used to control for country variations in the study. GDP is measured by the logarithm of each country's GDP each year. GDP information is obtained from the website of the world bank. Table 2 presents the operationalization of research variables.

Table 2. Operationalization of Research Variables

Variable	Definition	Measurement	Source
Firm Performance (ROA)	Firm profitability is measured by the ratio of net income divided by total assets of book value (Buallay, 2018).	Net income/total asset	Thomson Reuters Database
ESG Information (ESG)	Environmental, social, and governance performance scores were collated by the Asset4 database by Thomson Reuters (Velte, 2019)	ESG Score (Alareeni & Hamdan, 2020)	Thomson Reuters Database
Environmental (ENV)	Environmental performance score collated by the Asset4 database by Thomson Reuters (Velte, 2019)	Environmental Score (Alareeni & Hamdan, 2020)	Thomson Reuters Database
Social (SOC)	Social performance obtained from Asset4 (Velte, 2019)	Social Score (Alareeni & Hamdan, 2020)	Thomson Reuters Database
Governance (GOV)	Governance performance obtained from Asset4 (Velte, 2019)	Skor governance (Alareeni & Hamdan, 2020)	Thomson Reuters Database
Leverage (LEV)	The ratio of total debt divided by total equity (Khalil *et al*., 2019)	$LEV = \frac{Debt}{Equity}$ (Khalil *et al*., 2019)	Thomson Reuters Database
Firm Size (SIZE)	Natural logarithm of total assets (Velte, 2019)	SIZE = Ln(total asset) (Liao *et al*., 2015)	Thomson Reuters Database
Firm Age (AGE)	Firm age since established	Firm age since established	Company's Website
Gross Domestic Product (GDP)	The total of all value-added created in an economy	GDP = Ln(GDP)	World Bank Website

This study examines four research models by testing each independent variable on the dependent variable. We defined our variables' relationship in Figure 2.

$$ROA_{it} = \alpha + \beta_1 ESG_{it} + \beta_2 LEV_{it} + \beta_3 SIZE_{it} + \beta_4 AGE_{it} + \beta_5 GDP_{it} \quad (1)$$

$$ROA_{it} = \alpha + \beta_1 ENV_{it} + \beta_2 LEV_{it} + \beta_3 SIZE_{it} + \beta_4 AGE_{it} + \beta_5 GDP_{it} \quad (2)$$

$$ROA_{it} = \alpha + \beta_1 SOC_{it} + \beta_2 LEV_{it} + \beta_3 SIZE_{it} + \beta_4 AGE_{it} + \beta_5 GDP_{it} \quad (3)$$

$$ROA_{it} = \alpha + \beta_1 GOV_{it} + \beta_2 LEV_{it} + \beta_3 SIZE_{it} + \beta_4 AGE_{it} + \beta_5 GDP_{it} \quad (4)$$

Where:

ROA : Firm Performance

ESG : Environmental. Social, and Governance

ENV : Environmental

SOC : Social

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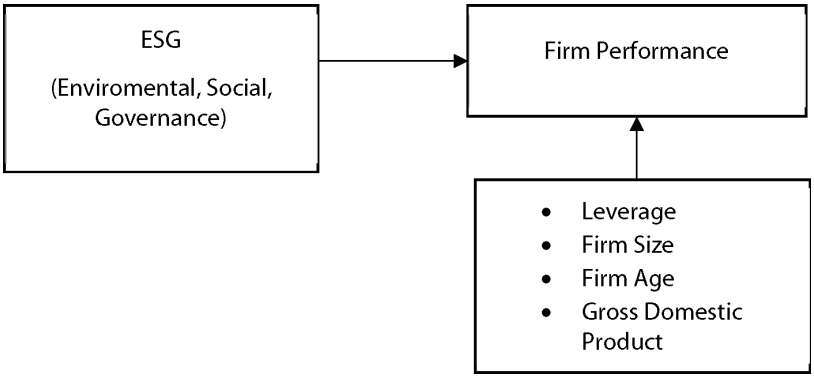
GOV: Governance
LEV : Leverage
SIZE : Firm Size
AGE : Firm Age
GDP : Gross Domestic Product

Figure 2. Research Framework



RESULT AND DISCUSSIONS

Descriptive Statistics

Descriptive statistics result is presented in table 3. The mean score of ROA is 0.079, with a minimum score is -0.423, and a maximum score is 1.149. The average ESG score is 44.98. This score is in grade C. Grade 'C' indicates satisfactory relative ESG performance and a moderate degree of transparency in reporting material ESG data publicly (Refinitiv, 2021). The maximum ESG score is 89.73. This score is in grade A. Grade 'A' indicates excellent relative ESG performance and a high degree of transparency in reporting material ESG data publicly. ESG's minimum score is 2.77. This score is in grade D. Grade 'D' indicates poor relative ESG performance and an insufficient degree of transparency in reporting material ESG data.

Table 3. Descriptive Statistic

Variable	Mean	Std. Dev.	Min	Max
ROA	0.079	0.098	-0.423	1.149
ESG	44.987	19.583	2.77	89.73
ENV	36.448	25.083	0	97.15
SOC	48.752	23.362	0.71	97.35
GOV	47.734	21.636	3.04	98.7
LEV	1.68	2.558	0.002	49.223
SIZE	31.39	1.116	27.763	34.712
AGE	40.334	27.786	1	186
GDP	26.849	0.461	26.048	27.744

The average environmental score (ENV) is 36.44, with a minimum score of 0 and a maximum score of 97.15. the average environmental information is in grade C. This result also showed that some companies had not disclosed their environmental information. Therefore 0 scores are assigned to them (minimum score of ENV). The average social score (SOC) is 48, with a minimum score of 0.71 and a maximum score of 97.35. This average GOC score is also in grade C. Average governance score (GOV) is 47.73, with a minimum score of 3.04 and a maximum score of 98.7. The average score of GOV is in grace C too.

Regression Result

Table 4 shows the results of the regression test. Table 4 model 1 showed that ESG has a significant positive effect on firm performance (ROA) with a significant level of 0.041. It indicates that better ESG information increases firm performance. This result aligns with prior research showing that ESG disclosure positively affects firm performance (Buallay, 2018; Velte, 2019; Alareeni & Hamdan, 2020). There may be a positive relationship between ESG and ROA because the yearly variation of the ESG disclosure enhances the positive image of firms and then their performance (Alareeni & Hamdan, 2020).

Table 4. Regression Results

	ROA			
	(1)	**(2)**	**(3)**	**(4)**
ESG	0.000384** (0.041)			
ENV		0.00029365** (0.020)		
SOC			0.000304** (0.026)	
GOV				0.000234** (0.029)
LEV	-0.003663*** (0.000)	-0.003768*** (0.000)	-0.003763*** (0.000)	-0.003884*** (0.000)
SIZE	0.000 (0.988)	-0.027394*** (0.000)	-0.02661*** (0.000)	-0.025341*** (0.000)
AGE	0.001 (0.921)	0.000526*** (0.002)	0.000534*** (0.000)	0.000537*** (0.002)
GDP	0.086590* (0.052)	0.029733*** (0.005)	0.028494*** (0.006)	0.028980*** (0.006)
YEAR	yes	yes	yes	yes

**** p<.01, ** p<.05, * p<.1*

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The results also found that each component of ESG, namely environmental, social, and governance information, positively influences firm performance. It means ENV increases firm performance (ROA). Model 2 showed that ENV has a significant positive relationship with ROA with a significant level of 0.020. Model 3 showed that SOC significantly positively affects ROA with a significant level of 0.026. That means social information can enhance firm performance. Model 4 showed that GOV has a significant positive effect on ROA with a significant level of 0.029. It means governance information could improve firm performance.

These results found that ESG and its three-pillar components, namely, environmental, social, and corporate governance information, positively affect firm performance. These results are consistent with Velte (2019) research that the three pillars of ESG, namely environmental, social, and governance, positively affect firm performance (ROA). Alareeni & Hamdan (2020) mentioned that firms with high ESG, EVN, and CSR disclosure levels have higher operational and financial performance (ROA). This evidence showed that ESG and its three pillars have a significant and valuable factor for firm performance in ASEAN companies.

Firm disclosure of sustainability efforts can help efficiently manage its resources and increase its value (Mohammad & Wasiuzzaman, 2021). ESG factors tend to treat them either as a way to attract socially responsible asset owners or as a tool to reduce their portfolio companies' regulatory or reputational risks. Companies that adopt governance mechanisms will provide more helpful information to investors and other users of financial statements to reduce asymmetry information (Alareeni & Hamdan, 2020). ESG performance could mitigate financial risk during a financial crisis (Broadstock et al., 2020). Buallay (2018) also found that disclosing more information about ESG could enhance firm performance.

ESG factors and their components, environmental, social, and governance factors, represent a company's non-financial performance. This information invites investors to consider ESG issues when evaluating firm performance (Atan et al., 2018). Better ESG disclosure helps companies increase their corporate performance, create a good image and credibility and promote corporate ethical practices (Kumar & Firoz, 2022). Fischer & Sawczyn (2013) found a positive relationship between corporate social performance and financial performance (ROA) and concluded is affected by the degree of innovation. The better ESG-performing firms have good firm performance (Chelawat et al., 2016) and ESG effects on firm valuation (Fatemi et al., 2017). ESG helps investors assess a company's behavior and determine the company's future financial performance (Ting et al., 2019).

ESG disclosure is a crucial way to report non-financial information, providing stakeholders with a stable flow of valuable data and information and reducing information asymmetry (Ellili, 2022). This condition reduces transaction costs and distribution competition between key stakeholders, provides a competitive advantage in procuring and using environmental resources, and ultimately positively impacts corporate value (Ruan & Liu, 2021). Moreover, from a resource-based theory and strategic management perspective, ESG activities can create a unique competitive advantage for a company (Ruan

& Liu, 2021). The reputation of a sustainability report is considered a valuable tangible resource that can provide long-term benefits for the company (Lourenço et al., 2014).

We found that social information has a positive effect on firm performance. This result is consistent with Yoo & Managi (2021) found that corporate social scores positively affect company performance. Companies are starting to realize and consider corporate social responsibility practices as a driver of company market performance (Alareeni & Hamdan, 2020). Social responsibility is fundamental and relevant in science and business management (Ting et al., 2019). The Principles control approximately 50% of the world's institutional asset base for Responsible Investment signatories, demonstrating the financial market's commitment to adopting ESG standards for investment decisions (Ting et al., 2019).

The result also showed that better governance information could increase firm performance. This result supported the literature by Alareni & Hamdan (2020) that higher governance practices improve and positively affect operational and market performance. Companies that adopt governance mechanisms will provide more helpful information to investors and other users of financial statements to reduce asymmetry information (Alareeni & Hamdan, 2020). The results also showed that the control variables of research, which are leverage and firm size, hurt firm performance, but firm age and GDP positively affect firm performance. This finding indicates that smaller companies and leverage have greater performance rather than larger companies. It also indicates that the older company does more to improve the firm performance

Robustness Test

Table 5 shows the result of the robustness test. Using Tobin'sTobin's Q, we measured firm performance with market value (Buallay, 2018; Alareeni & Hamdan, 2020; Ting et al., 2019). Robustness test results showed that ESG positively impacts market firm performance. Environmental and social pillars have a positive effect on market firm performance. Meanwhile, governance does not affect market firm performance. This finding consists of our regression result that ESG positively impacts firm performance measured by ROA. The result found that governance information does not impact a on firm's market performance, indicating that there is no significant effect on firm value creation if the company discloses the information on firm governance (such as management, shareholders, and CSR strategy).

The robustness test result also showed that environmental and social information could enhance firm market performance. It indicates that the higher disclosure of overall ESG, environmental, and social information enhances a firm's market performance. This condition may be because the yearly variation of the ESG disclosure enhances the positive image of firms and then their performance (Alareeni & Hamdan, 2020). ESG initiatives may significantly improve valuation effects (Ting et al., 2019). Firms with higher environmental initiatives can improve shareholders' wealth, and social initiatives lead to value creation (Ting et al., 2019).

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Table 5. Robustness Test Result

	Tobin's Q			
	(1)	**(2)**	**(3)**	**(4)**
ESG	0.005205* (0.076)			
ENV		0.0070849*** (0.003)		
SOC			0.007144*** (0.005)	
GOV				0.000 (0.895)
LEV	0.002	0.006	0.007	0.001 (0.969)
SIZE	-0.52076***	-0.786046*** (0.000)	-0.762757*** (0.000)	-0.48500*** (0.000)
AGE	-0.096	0.017193*** (0.000)	0.017361*** (0.000)	0.100 (0.601)
GDP	1.96799***	0.654648*** (0.011)	0. 637300*** (0.014)	1.8958433*** (0.010)
YEAR	yes	yes	yes	yes

**** p<.01, ** p<.05, * p<.1*

This result contradicts the finding by Ruan and Liu (2021), who assumed that in emerging market countries where ESG activities are not active, the ESG information disclosure requirements for listed companies might evolve into a severe cost burden for these companies, thereby leading to a significant negative correlation between ESG ratings and firm performance.

CONCLUSION

Increasingly visible environmental and risk issues have made more regulatory agencies and enterprises aware of the importance of environmental, social, and governance (ESG) activities. This study examines the effect of company environmental, social, and governance (ESG) information on firm performance. The study's results found that overall ESG information can improve company performance. The three ESG pillars of environment, social, and governance show similar results, positively impacting corporate performance. These results indicate that carrying out environmental, social, and corporate governance-related activities and disclosing them is proven to improve firm performance in developing countries' companies in ASEAN. This positive relationship may be due to the year-to-year fluctuations in ESG disclosure, improving the company's positive image and, thus, its performance. The improvement in ESG is attractive to stakeholders because disclosure allows the company to minimize the information asymmetry between the company and its stakeholders and improve its performance. Companies with good ESG exposure gain more stability and resilience regarding operational and financial performance.

This research can be used as academic literature to see the effect of environmental, social, and corporate governance information on company performance. Research findings can also be considered for companies to carry out activities related to environmental, social,

and better corporate governance and disclose them to reduce information asymmetry and improve company performance. We also found that ESG information has positive effects on firm market performance. Rather than an expense, managers could consider ESG as an investment. They are addressing the environmental, social, and institutional requirements, and the different stakeholder requirements result in value creation for firms. This research can also be a consideration for regulators to mandate companies to practice environmental, social, and good corporate governance as a form of corporate awareness to be environmentally and socially responsible both inside the company and outside the company, which this activity is empirically proven to improve company performance.

This research has its limitations. This study uses listed companies presented in the Thomson Reuters database in developing Southeast Asian countries, so several developing countries in Southeast Asia are not included in the research observations.

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Entrepreneurial Marketing Impact Score on MSME Performances Through Its Dimension

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Abstract

The presence of the entrepreneurial marketing concept is considered capable of overcoming marketing problems in MSMEs. This study aims to determine the specific magnitude of the influence score given by each entrepreneurial marketing dimension to MSMEs in Bengkulu City. This study focuses on culinary MSMEs that are the mainstay sector of the region. The effective and relative contribution has been used to measure the influence score of its dimension on performance and 183 questionnaires are distributed to the owners of MSMEs in Bengkulu City. The results show that the dimension of resource leverage most dominantly affects business performance. Meanwhile, calculated risk-taking has a minor effect. Essentially, culinary MSME business actors in Bengkulu City must improve their ability to effectively predict the problem in the future that can be done by joining risk management certification or webinar.

Keywords:

entrepreneurial marketing; business performance; micro small and medium enterprises; culinary sector

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INTRODUCTION

Unemployment is still an ongoing problem in many countries, including Indonesia. For example, in Bengkulu Province in 2021, the unemployment rate is 3.35%. The total workforce of Bengkulu Province in 2021 is 1,083,744 million people, which means that 4,031 residents of Bengkulu Province hold the unemployed status. Limited employment opportunities are one of the leading causes of many people being unemployed even though they have obtained a bachelor's degree (Hossain et al., 2018). One of the factors that are considered to overcome the problem of unemployment is MSMEs. The data from the Ministry of Cooperatives and MSMEs explains that MSMEs contribute to the Indonesian economy. MSMEs in Indonesia can absorb 97% of the total workforce in Indonesia (Makmur et al., 2018). Therefore, the number of MSMEs will affect the absorption of labour and reduce unemployment (Suhaili & Sugiharsono, 2019).

According to data from the Bengkulu Province Cooperatives and MSMEs Office (2019), the number of MSMEs in Bengkulu City has continued to increase over the last four years because of the strategic location of Bengkulu City and it has many tourist destinations. There are 34 natural tourist destinations, 12 historical tourism destinations, and two modern tourist destinations. Bengkulu City is the second largest city on the west coast of Sumatra Island, Indonesia, with 7 km coastline and a beach width of about 500 meters. Based on data obtained through the Central Bureau of Statistics of Bengkulu City, since 2018, tourists who visited tourist attractions in Bengkulu City were 2,154,928 with a percentage of 68.56. Due to the number of destinations and tourists visiting Bengkulu, it should positively impact the growth of culinary MSMEs because restaurants are one of the essential aspects of supporting tourism in an area. The existence of restaurants is influenced by the progress made in the tourism sector. Based on data from the Independent Assessment of the Indonesian Creative City or Regency (PMK31), the Deputy for Infrastructure of the Indonesian Creative Economy Agency in 2020 said that Bengkulu City has a turnover of sub-sectors in the culinary sector reaching 7.2 billion per year.

However, in fact, the growth rate of the culinary business sector to GDP is unstable and even reaches a minus number (BPS Bengkulu City, 2020). Undeniably, the COVID-19 pandemic throughout 2020 also had a negative impact on the growth of MSMEs in all business sectors, especially culinary. The presence of government policies such as Large-Scale Social Restrictions (PSBB) has resulted in limited business activities that require physical contact. Hence, the growth of MSMEs must balance with an increase in business performance. SMEs are more susceptible to environmental changes than larger enterprises (Cacciolatti & Lee, 2016). Therefore, entrepreneurs must create solutions to remain competitive. The solution is the expansion of marketing efforts (Cacciolatti & Lee, 2016). Small enterprise marketing is different from large enterprise' because multinational enterprises do not experience limited resources. MSME marketing approaches and decision-making tend to be more unusual, intuitive, informal, unstructured, chaotic, and unplanned. As a result, small and medium-sized enterprises must use efficient marketing strategies and evaluations (Rezvani & Fathollahzadeh, 2020).

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Marketing issues that cannot be adequately handled can lead to business failure (Fatoki, 2019). Despite the fact that they are 'small', their goal is to grow quickly and become significant players in their area instanously. Entrepreneurship's core aim is growth, and marketing is the key to achieving that goal (Shiratina et al., 2016). According to Sadiku-Dushi et al. (2019) business actors or managers must immediately implement innovative concepts of management that can keep up with the change in the market.

Entrepreneurial marketing bridges marketing and entrepreneurship by combining principles from both sectors. Both sectors are customer-centric and involve the acceptance of risk and uncertainty. As a result of these parallels, the experts believe that entrepreneurial marketing might help entrepreneurs adapt to the changing situations, uncover new possibilities, and improve their innovative skills (Kilenthong et al., 2016). The concept of entrepreneurial marketing has become an alternative to developing marketing activities for small entrepreneurs who still depend on conventional marketing activities and have limited resources (R. C. Becherer et al., 2012). Stephen et al. (2019) found that entrepreneurial marketing has an important role, especially for small enterprises that face more challenges such as the level of competition, limited information and insight about the market, the weakness of product innovation, limited capital, lack of business skills and entrepreneurial spirit. Those limitations will have an impact on small enterprises and will result in failure to compete with large enterprises if they do not adopt the concept of entrepreneurial marketing. With entrepreneurial marketing, the entrepreneurial marketing mix will be more accessible than conventional marketing, which uses traditional marketing techniques. If an entrepreneur can use entrepreneurial marketing in its marketing, it will have a better chance of getting ahead of the competition. And that so, small and medium-sized business owners need to learn about entrepreneurial marketing if they want their businesses to grow and become successful (Makmur et al., 2018). Entrepreneurial marketing consists of several dimensions. Fiore et al. (2013) reveals that entrepreneurial marketing consists of six dimensions, without resource leverage. The study considers that resource leverage is a general concept that not only exists in the application of entrepreneurial marketing but also the concept of entrepreneurship as a whole. In contrast, research conducted by Morris et al. (2002) are seven: opportunity-driven, proactiveness, innovation-focused, customer intensity, risk management, resource leverage, and value creation. The seven dimensions of Morris et al. (2002) is supported by research conducted from some scholars such as Rezvani et al. (2013), Gorica & Buhaljoti (2016), Eggers et al. (2020).

The importance of entrepreneurial marketing is that it can positively influence the performance of MSME actors. Numerous academics researching the same subject have emphasized the critical role of entrepreneurial marketing in MSME performance. Performance is the most important factor to evaluate an organization's operations (Al-Tit, 2017). Business performance refers to the results of a company's business activities in a certain period and based on established standards (Kotane & Kuzmina-Merlino, 2017). High performance enterprise contributes to removing obstacles and expands the potential for SMEs to develop and thrive in the global market (Aminu & Shariff, 2015). The majority of academics describe SME performance in terms of the

firm's significant outcomes in terms of sales growth, investment efficiency, customer acquisition, rising market share, and returns, which may be identified as a "complex set of operations that integrate skills and knowledge" (Hoque, 2018). There are many criteria and standards to evaluate an enterprise's overall success. Becherer & Helms (2016) stated that business performance is evaluated based on the company's relative market share and growth rate. According to Venkatraman & Ramanujam (1986), the concept of business performance can be focused on using simple results from treasury or financial metrics that are considered appropriate to explain the achievement of a business goal. Financial performance indicators are reflected, for example in market growth, profitability, and earnings per-share. On the other hand Semrau et al. (2016) explains that financial measurement can be done by comparing changes in the value of financial statements issued by companies. The broadest concept of performance not only includes financial performance, but also operational or non-financial performance (Al-Hakim & Lu, 2017). Mojekeh et al. (2018) and Fatoki (2019) defined firm performance as a set of financial and non-financial variables. Similarly, Mojekeh et al. (2018) identified financial performance measures such as return on assets (ROA), return on investments (ROI), return on equity (ROE), market share sales growth, and profitability. Meanwhile, Non-financial performance is measured in terms of customer satisfaction, employee commitment, innovation capability, and internal business process improvement. Other research conducted by Wu et al. (2020) explained that non-financial performance refers to non-monetary activity. For instance, its measurements can be done through stakeholder satisfaction and organizational growth. Additionally, based on Becherer et al. (2012) non-financial performance of a business can also be assessed through the personal owners' goals and reputation. Following the research, the success of an entrepreneur or owner is frequently measured by how the venture's compensation affects their wealth and standard of living. Regarding reputation, the higher the value of customer satisfaction, the better the company's reputation. A company with a good reputation in the eyes of customers has a good picture of the company's business performance.

Quantitative study by Sadiku-Dushi et al. (2019) found that three dimensions of entrepreneurial marketing, namely: opportunity-focus, resource leverage, and value creation have a significant impact and are positively related to SME performance. In contrast, Rashad (2018) reveals that only calculated risk-taking, value creation, and opportunity focus are positively related to SME performance from any sectors in Jeddah. The previous study conducted by Fatoki (2019) found significant positive connections between opportunity-focused, customer intensity, resource leveraging, value creation, and SMEs' financial success. Similar research on entrepreneurial marketing conducted by Hamali et al. (2016) explain that entrepreneurial marketing has a positive effect both on marketing and financial performance. The findings of Fard & Amiri (2018) show a positive and significant effect of EM on the market and innovative performances of halal food SMEs. According to Shuremo et al. (2021) the relationship between small and medium-sized businesses' performance and focus on innovation and customers is positive and statistically significant. On the other hand, the relationship between small and medium-sized businesses' performance

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and their focus on taking risks is negative and statistically significant. The results are consistent with earlier empirical research, which indicates that not all characteristics of entrepreneurial marketing affect a firm's performance.

Based on the previous explanation, this research aimed to explore the influence of entrepreneurial marketing dimensions on the performance of MSMEs so the outcomes can be used as insight for further study in a similar sector and also as a reference for MSME actors in Bengkulu City to continue developing their culinary MSMEs. The research gaps found are: (1) Although many studies have explored the influence of entrepreneurial marketing dimensions on the performance of MSMEs, there is no detailed investigation of specific impact scores from each dimension. Hence, this study aimed to determine entrepreneurial marketing through its dimensions, such as proactiveness, opportunity focus, calculated risk-taking, innovation, customer intensity, resource leverage, and value creation, and affects the business performance of culinary MSMEs in Bengkulu city by calculating the effective and relative contribution. As mention above, there are a variety of definitions of entrepreneurial marketing since the discipline is still in its development (Shiratina et al., 2016). In this study, to determine whether a more than twenty-year-old concept may still represent current entrepreneurial marketing practices, the researcher aimed to validate Morris's (2002) seven-factor dimensions in Bengkulu City by conducting experiments. (2) In addition, the earliest study on entrepreneurial marketing measured performance, focusing only on one of the financial or non-financial aspects. There are still few studies that measure performance by integrating the two. Whereas, based on the past study conducted by Baines & Langfield-Smith (2003) in Albalak et al. (2019) using both financial and non-financial performance to measure business performance allows the parties concerned to analyze the improvement in all business areas. Therefore, to fulfill and complete the existing gap, the dimensions of business performance examined in this research will measure the effect of entrepreneurial marketing dimensions on financial and non-financial performance. For examining financial performance, this paper refers to the research of Mojekeh et al. (2018) i.e., efficiency, growth, and profit. In addition, non-financial performance will be conducted using two indicators, according to Murphy et al. (1996) in Becherer et al. (2012), i.e., personal achievement of business owners and reputation, which have not been researched jointly concerning culinary MSMEs in Bengkulu. As a novelty, this study employed empirical research to determine how much impact value has been received by the MSMEs' performance by applying entrepreneurial marketing and will be the first to correlate entrepreneurial marketing aspects with the performance of MSMEs in Bengkulu.

METHODS

In this study, the population selected was the owner of the culinary sector MSME located in Bengkulu City with a total of 337 business actors based on data obtained from the Bengkulu City Tourism and Creative Economy Office. Based on calculations using the Slovin formula with a sampling error rate of 5% and 337 population of MSME culinary actors, the number of MSME actors in the culinary sector sampled

was 183 people. The sampling technique used in this study was random sampling. 183 participants responded to the survey in this study. The questionnaire was conducted as a data collection method by distributing a list of questions to the respondents. The answers represent on a Likert scale of 1 (strongly disagree) to 4 (strongly agree). Validity and reliability tests determined using Cronbach's alpha and r table values.

This study uses four main data analysis techniques, which are descriptive analysis, correlational, multiple regression analysis, relative contribution, and effective contribution. First, descriptive analysis was intended to describe research variables and respondent characteristics. Next, the Pearson correlation test aimed to identify correlations between variables in the model. At the same time, this study used multiple linear regression to determine the relationship or influence that exists between the dimensions of entrepreneurial marketing and business performance. The equation of multiple regression on this study can be seen as follows:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + e$$

Where, y represents dependent variable which is business performance, a represents the intercept, $b_{1,2,3.....7}$ represent slope coefficient for each entrepreneurial marketing dimensions, $X_{1,2,3.....7}$ represent independent variable which in this study explained by the seven dimensions of entrepreneurial marketing such as proactiveness, opportunity focus, calculated risk-taking, innovation, customer intensity, resource leverage, and value creation, e represents error terms. Last, this study will estimate the relative contribution and effective contribution of each entrepreneurial marketing dimensions. Effective contribution (SE) is a regression analysis term that refers to the contribution of an independent variable (X) to the dependent variable (Y). Meanwhile, the relative contribution (SR) is utilized to determine the contribution of each independent variable or predictor. This computation is performed to determine the size of each independent variable's contribution to the total number of variables. The relative contribution measures the intensity of each variable's contribution independent of other factors not addressed in this study. Therefore, the intensity of each independent variable contribution can be predicted. The effective contribution and relative contribution can be estimated using the following formulas:

$$SE(X) = \beta_x \,.\, coefficient\ of\ correlation\,.100\% \qquad (1)$$

Where, β_x represent regression coefficient value of independent variable.

$$SR(X) = \frac{SE(x)\%}{R^2} \qquad (2)$$

Where, R^2 represent coefficient of determination.

RESULT AND DISCUSSIONS

Respondent Characteristics

Table 1 shows that the proportion of respondents in this study were 91 male respondents (49.73%) while female respondents were 92 people (50.27%). The highest number of respondents in this study were aged 21-30 years which were 71 people

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(38.80%). Furthermore, the number of respondents aged 31-40 years were 48 people (26.23%) and 41-50 years were 47 people (25.68%). Meanwhile, respondents with age > 50 years were 13 people (7.1%). The lowest number of respondents was at the age level of fewer than 21 years, namely 4 people (2.19%). The respondents' ages indicate that they are mature enough to provide reasonable responses to the research questions. Most of the respondents had the latest education level of Bachelor (S1) were 76 people (41.53%) and senior high school education level were 64 people (34.97%). Meanwhile the number of respondents who had a Diploma education level were 23 people (12, 57%). Moreover, the junior high school education level respondents were 8 people (6%). Respondents with the last educational level of Postgraduate (S2) are 12 people (6.56%).

Table 1. Respondent Characteristics

Category		Total	Proportion
Gender	Male	91	49,73%
	Female	92	50,27%
Age	< 21 years old	4	2%
	21 - 30 years old	71	38,80%
	31 - 40 years old	48	26,23%
	41 - 50 years old	47	25,68%
	> 50 years old	13	7,1%
Education	Junior High School	8	6%
	Senior High School	64	34,97%
	Diploma	23	12,57%
	Bachelor	76	41,53%
	Postgraduate	12	6.56%
Type of Enterprise	Micro	120	65,57%
	Small	56	30,6%
	Medium	7	3,8%
Number of Employee	< 10	120	68,31%
	$\leq$ 50	56	28,42%
	51 - 300	7	3,8%

Source: Author's Data Processing Results (2021)

From the finding, the majority of respondents had academic qualifications appropriate for business ownership, meaning that most MSMEs in Bengkulu are owned and handled by professionals. Culinary MSMEs with the type of micro-enterprise were 120 enterprises (65.57%). Furthermore, MSMEs with the category of small enterprise were 56 enterprises (30.6%) and the least number enterprises were medium-sized enterprises which were only 7 enterprises (3.8%). There were 120 (68.31%) of culinary MSMEs in Bengkulu City that had <10 employees. Furthermore, MSMEs with a number of employees of less than 50 people were 56 MSMEs (28.42%) and MSMEs with 51 to 300 employees were 7 MSMEs (3.28%).

Table 2 reveals that the indicators to measure the variables in this study met the criteria. Entrepreneurial marketing and business performance have a greater r count than the r table (0,361) and have more significant alpha than the acceptable alpha of 0,70 (Taber, 2018), further tests can be performed.

Table. 2 Reability and Validity Test

Measurement Items	Number of Item	Cronbach Alpha	r_{count}
Entrepreneurial Marketing	40	0,945	0,701
Business Performance	18	0,843	0,827

Source: Author's Data Processing Results (2021)

Descriptive statistics is a statistical analysis that provides an overview of the characteristics of each research variable that usually seen from the mean, standard deviation, maximum, and minimum values. Based on Table 3. It regarding descriptive statistics, it is found that descriptive statistics with a total of 183 samples can be seen that the highest average score is resource leverage, while the lowest average score is calculated-risk taking. This show that culinary MSMEs in Bengkulu City are wary of calculated risk-taking, but pay attention to resource leverage, customer intensity, opportunity focus, proactiveness, innovation, value creation.

Table 3. Descriptive Statistics of Dimension of Entrepreneurial Marketing

Entrepreneurial Marketing Variable	Minimum	Maximum	Mean	Std. Deviation
Proactiveness	12.00	29.00	23.8798	3.03220
Opportunity-Focus	13.00	28.00	22.3825	3.22526
Calculated-Risk Taking	3.00	13.00	10.2459	2.06479
Innovation	12.00	29.00	20.7650	2.85443
Customer Intensity	13.00	33.00	27.1639	3.35048
Resource Leverage	15.00	37.00	30.2678	3.95849
Value Creation	9.00	24.00	20.4863	2.65789

Source: Author's Data Processing Results (2021)

Table 4 shows that opportunity focus and resource leverage statistically have a positive and significant influence on performance. It has a t-value greater than the t-table and a significance level less than 0.05. However, the four other dimensions in this research including value creation innovation, customer intensity, and calculated risk-taking were positively influenced but they did not significantly impact performance. On the other hand, Table 5 shows proactiveness negatively impacts business performance, although it is not statistically significant. Based on multiple regression analysis conducted by Hamali (2015), the elements of entrepreneurial marketing that include proactive, resource leveraging, value creation, and customer intensity have a significant and positive influence on business performance. Yet, other research by Mojekeh et al. (2018) get

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results revealed only innovativeness and proactiveness, that positively and significantly affected the performance of SMEs. Meanwhile, research conducted by Sadiku-Dushi et al. (2019) shows that proactiveness and calculated risk-taking have negative relationships with overall SME performance. In contrast, innovativeness, customer intensity, opportunity focus, resource leveraging and value creation have a positive relationship with overall SME performance.

Table 4. Regression Result

Model	Coefficients		t
	B	Std. Error	
(Constant)	10.672	6.091	1.752
Proactiveness	-.212	.278	.-762
Opportunity- Focus	.828	.262	3.166
Calculated risk- Taking	.060	.345	.173
Innovation	.438	.249	1.758
Customer Intensity	.036	.249	.144
Resource Leverage	.994	.206	4.815
Value creation	.151	.307	.493

Source: Author's Data Processing Results (2021)

However, in the regression analysis, the calculation results of the coefficient show the R-Square value was 40.4%, while the Adjusted R-squared was 0.380 (38%) (see Table 5). If there are two or more independent variables, the Adjusted R-square value should be used in determining the effect of the independent variable simultaneously on the (Y) variable and reducing the bias. This means that the seven dimensions of the entrepreneurial marketing variable (X) affect 38% of business performance. At the same time, the remaining 62% is influenced by other variables.

Table 5. R Square Test Results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.635[a]	.404	.380	8.03098

Source: Author's Data Processing Results (2021)

The effective contribution method proposed determines the amount of the effective contribution of each predictor or independent variable from the overall prediction (Braun & Oswald, 2011). Meanwhile, the calculation of the relative contribution is proposed to show the information about the contribution of a predictor variable to the number of regression squares (Braun & Oswald, 2011). Table 6 and Table 7 will describe and explain the effective contribution and relative contribution of the entrepreneurial marketing on business performance.

Table 6. The Effective Contribution

Dimensions	Coefficient Regression (*β*)	Coefficient Correlation (r)	Effective Contribution (%) ((*β*)*x* (*r*)*x* 100%)
Proactiveness	-0,063	0,364	|-2,3%|
Opportunity-focus	0,262	0,519	13,6%
Calculated Risk Taking	0,012	0,299	0,36%
Innovation	0,123	0,365	4,5%
Customer Intensity	0,012	0,381	0,46%
Resource Leverage	0,386	0,576	22,24%
Value Creation	0,039	0,396	1,54%

Source: Author's Data Processing Results (2021)

In this study, the researchers searched for the effective and relative contribution of each dimension of entrepreneurial marketing. Based on the calculation table, the following is a sequence of dimensions that describes the effective contribution from the largest: resource leverage (22,24%), opportunity focus (13,6%), innovation (4,5%), proactiveness (2,3%), value creation (1,54%), customer intensity (0,46%), and calculated risk-taking (0,36%).

Table 7. The Relative Contribution

Dimensions	Effective Contribution ((*β*).(*r*).100%)	R square	Relative Contribution (%)
Proactiveness	-2,3%	40,4%	|-5,7%|
Opportunity-focus	13,6%		33,7%
Calculated Risk Taking	0,36%		0,9%
Innovation	4,5%		11,1%
Customer Intensity	0,46%		1,1%
Resource Leverage	22,24%		55%
Value Creation	1,54%		3,8%

Source: Author's Data Processing Results (2021)

According to Table 7, the outcomes show the sequence of dimensions that give a relative contribution is the same as the sequence of dimensions based on the results of the effective contribution where resource leverage (55%) and gives the most significant impact score. Even though there are dimensions with a negative relative contribution, calculated risk-taking (0,9%) still has the most minor impact score because the relative contribution follows the absolute value rule. A negative symbol in the relative contribution calculation only clearly demonstrates that the dimension has a negative relationship to the performance business.

The value of Adjusted R-square of 38% indicates that the independent variable's effect on the dependent variable is relatively minimal. This is proportional to the percentage of effective contribution (SE) of each of these entrepreneurial marketing aspects. When looking at the value of relative contribution (SR), it is possible to see the

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difference in the ability to contribute individually between the dimensions of resource leverage on business performance and the other six dimensions to business performance, where the relative contribution resource leverage value is much higher than the other dimensions. In this case, the researchers decided that the value of R squared may be regarded as appropriate since lower values of R squared have been reported in previous investigations, which supports our conclusion (-dushi, 2019; Hacioglu et al., 2012).

CONCLUSION

The main objective of this study is to further study the impact of the entrepreneurial market on business performance in the culinary sector in Bengkulu City. Entrepreneurial marketing is rarely used by the MSMEs. Based on the calculation of the effective contribution and the relative contribution given by each entrepreneurial marketing dimension, the most dominant dimension that has an influence on business performance is the resource leverage dimension with an effective contribution value of 22.24% and a relative contribution value of 55%. On the other hand, the entrepreneurial marketing dimension with a minor impact score is the calculated risk-taking dimension with an effective contribution value of 0.36% and a relative contribution value of 0.9%. This shows that the culinary MSMEs in Bengkulu City consider calculated risk-taking is not the main factor in determining business performance. Additionally, the result of multiple regression linear revealed that resource leverage and opportunity focus positively and significantly affected performance. At the same time, value creation, innovation, customer intensity, and calculated risk-taking positively but not significantly affected performance. While, proactiveness negatively affected business performance. It can be argued that micro, small and medium-sized enterprises (MSMEs) in Bengkulu recognize the significance of resource leveraging as a method for achieving more significant results with fewer resources. Also, they tend to be highly opportunity-focused. They take advantage of every opportunity to improve their business performance. On the other hand, they may not be considered proactive and may be wary of taking a chance on something.

The findings of this study can be helpful for culinary MSMEs in Bengkulu City. Henceforth, MSMEs in Bengkulu City can contribute to maintaining the ability to explore various opportunities, such as frequently joining various festivals or culinary exhibitions; this is done so that MSME actors can understand the market conditions and can formulate the right strategy to gain profits. MSME entrepreneurs can also take part in training related to risk management, using resources effectively and efficiently, and attending workshops related to culinary businesses. Theoretically, this study only focuses on one sector, namely culinary, in Bengkulu City. Further researchers are expected to be able to add other variables that have the possibility to affect MSME business performance in the culinary sector and can conduct further research on Bengkulu Province. It may also be worthwhile to investigate the reasons behind the weak influence of entrepreneurial marketing on the performance of MSMEs in Bengkulu City. As mentioned earlier, the entrepreneurial marketing dimension used in this study is based on Morris, so that future research can use a different perspective.

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The Development of Good Micro, Small and Medium Enterprises Governance Indicators

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Abstract

A systematic literature review method was used in this study to find good governance for micro, small, and medium-sized businesses (MSMEs). The SEM-PLS approach was utilized to assess the effect of MSMEs' owners' competencies on the level of governance model implementation and the performance of MSMEs. The test results suggest implementing the governance model's concept can improve business performance. To be effective, however, owners of MSMEs must be willing to invest in their professional growth. Thus, based on the research findings, the MSMEs governance model, which is unique to this study, can serve as a standard for MSMEs' performance and a reference for various stakeholders involved in MSMEs' development initiatives.

Keywords:
MSMEs management; performance; competency; the principles of MSMEs governance

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INTRODUCTION

Micro, small, and medium-sized enterprises (MSMEs) account for between 58 and 61% of the Gross Domestic Product (GDP) (Tambunan, 2019). MSMEs are currently one of Indonesia's economic drivers. MSMEs have the potential to generate jobs for the community, particularly for those with limited education. Numerous studies from various countries also suggest that MSMEs are a significant factor in a country's economic success (Bouwman et al., 2018). According to Kongolo (2010), MSMEs in South Africa account for more than 60% of total employment, whereas MSMEs in Spain contribute significantly to economic growth (González-Loureiro & Castelo, 2012). MSMEs in Southeast Asian countries contribute significantly to economic success (Jaswadi et al., 2015).

In recent years, Indonesia has seen an increase in the number of MSMEs. According to data from the Ministry of Cooperatives and MSMEs, the number of MSMEs grew from 2010 to 2018. MSMEs totaled 52.7 million in 2010, continuously increasing over the preceding eight years. In 2018, Indonesia had 64.2 million MSMEs, a 21% growth from 2010. While the number of MSMEs continues to grow, many obstacles remain to overcome. According to the Central Statistics Agency statistics, up to 29% of MSMEs face financing constraints, 21.11 percent face marketing challenges, and 20.7 percent face raw material constraints. The MSMEs development program collaborates with various stakeholders, including the government, universities, private institutions, practitioners, communities, and the media, to foster the creation of strong, autonomous, knowledge-based, and technology-based MSMEs. Numerous micro, small, and medium-sized enterprises must prosper for an extended period. During the pandemic crisis, most MSMEs were forced to close their doors. Lutfi et al. (2020) assert that social distancing policies impacted MSMEs during the COVID-19 pandemic. As evidenced by the reduction in income and demand for MSMEs items, some people live in abject poverty. Effendi et al. (2020) found that MSMEs affected by COVID-19 must adapt their strategy to include social media to survive.

Observing the various problems faced by Indonesian MSMEs and the many MSMEs that went bankrupt at the beginning of the pandemic, according to a poll conducted by the Asian Development Bank (ADB) in 2020, more than half of all MSMEs had closed their doors temporarily. This condition is evidence of the weak governance of MSMEs in Indonesia, which is most likely the foundation of the MSMEs crisis. Furthermore, Rinaldo & Puspita (2018) found that MSMEs with weak governance did not develop and eventually failed. According to Jaswadi et al. (2015), the larger the MSMEs, the more governance they need. These two studies demonstrate the importance of solid governance for MSMEs. Good corporate governance consists of the following principles: transparency, accountability, responsibility, independence, and fairness. In general, large companies have adopted this concept. To be applied to MSMEs, modifications are needed to be useful and not burden MSMEs. MSMEs need to change how GCG is used so that it does not become an extra expense (Briozzo et al., 2019).

This research can be conducted with governance standards for Indonesian MSMEs, as multiple prior studies could not identify the GCG standards required for MSMEs.

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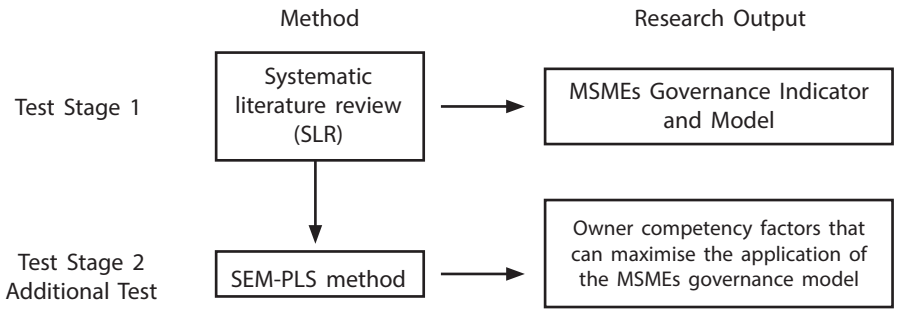
In general, previous research has focused mainly on the impact of applying the idea of GCG on firm performance by employing GCG indicators that are more suited for large businesses (Jaswadi et al., 2015; Mahzan & Yan, 2014; Nasrallah & El Khoury, 2022; Umrani et al., 2015; Günay & Apak, 2014). Through a systematic literature review method, the research will contribute new indicators of good MSME governance that may be utilized by parties such as the government, academics, practitioners, the business community, and other stakeholders in Indonesia desiring to promote MSMEs. This study will also do additional testing of competency variables related to the implementation of MSME governance and their effects on performance to find the competencies that support the best use of MSMEs governance models to improve MSMEs performance (Stephen & Stemshorn, 2016; Koenigsfeld et al., 2012; Som, 2007; Barbazza et al., 2015).

METHODS

This study will take place in 2 stages. Stage 1 involves developing the MSMEs governance model using the SLR technique. The second stage will assess the influence of the competency level variable on the extent to which governance is applied and firm performance to establish whether the MSMEs model effectively increases MSMEs performance. The SEM-PLS method will be used in Phase 2. At this point, the ability of MSMEs owners is looked at because governance is thought to be dependent on their ability.

Figure 1. Stages of Research



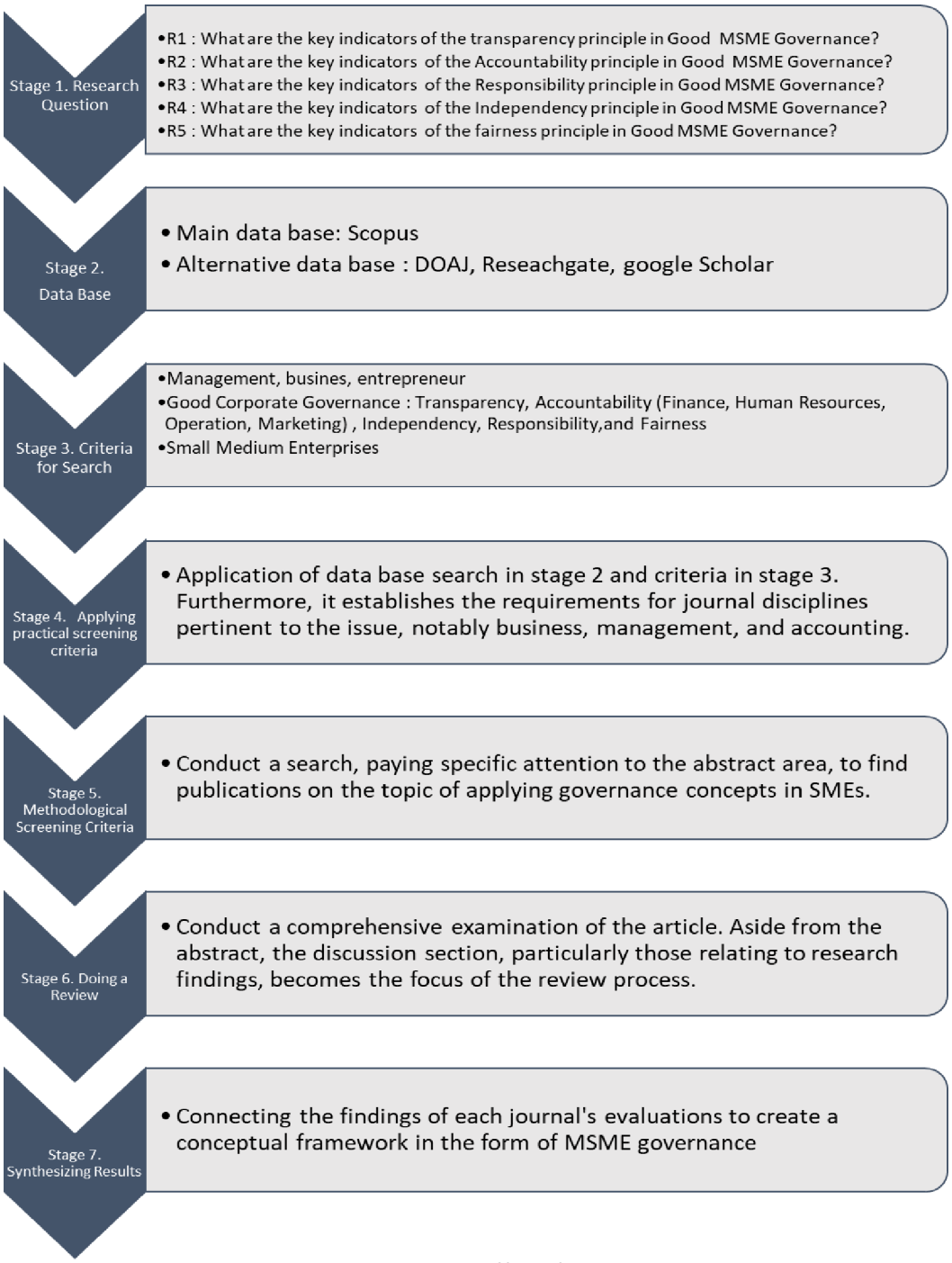
Source: Processed by Authors

Stage1. SLR method

This inquiry employs a systematic literature review (SLR) methodology. Fink (2012) describes the SLR approach as having seven phases. This study will be done between March 2020 and June 2021. The first step is to develop the research questions regarding the problem's phenomena and existing research. The second stage establishes the database from which the articles will be retrieved. This study uses various databases, with Scopus as the significant source and DOAJ, ResearchGate, and Google Scholar as secondary sources. The third stage involves setting the search parameters as words and phrases. The terms "good corporate governance" and "small and medium-sized firms" were used to

search for publications, books, and reports. Following that, practical and methodological screening criteria must be developed. The primary source is the Scopus journal in the business, management, and accounting fields, where the keywords "GCG" and "SMEs" are included. Then do a review and synthesize the findings.

Figure 2. Stages of Systematic Literature Review



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Stage 2. SEM-PLS Method

Additionally, after establishing the MSMEs governance model using the SLR technique, additional testing of HR competency variables on corporate governance and performance was conducted to provide an effective governance application model for MSMEs. The SEM-PLS approach will be used in Phase 2 (two). The phases are as follows. The first stage is the model specification. In this stage, specifying the variables to be assessed and the model to be tested create the model. Entrepreneurial competence (exogenous), accountability (intervening), fairness (intervening), independence (intervening), responsibility (intervening), transparency (intervening), and performance are all research variables in this study (endogenous). Using the method shown in Figure 1 above, we will determine each variable's MSMEs governance indicators.

The second stage is model identification. At this level, more specific indicators that can be used to quantify or explain the model are identified. Usually, this step is about solving the equation for each sign in a chosen model variable. The third stage is a model estimation. The appropriateness of various nested models is evaluated at this level. The Standardized Root Mean Square Residual (SRMR) is a measure used to determine the level of model fit; an SRMR value ≤ 0.08 indicates a good fit. The final stage is hypothesis testing and interpretation. This study tested the hypothesis using the student's t-statistic test. If the t statistic is greater than 1.96, then the hypothesis is accepted; otherwise, it is rejected.

Sampling Technique

This study used the sampling method known as purposive sampling, in which the sample is selected based on the researcher's preferences concerning specified criteria. Purposive sampling concentrates on individuals with specific characteristics who can effectively aid research (Etikan, 2016). This study's criteria were MSMEs located in the Greater Bandung area. Because this study employs one independent variable, five intervening variables, and two dependent variables, 137 observations (respondents) are required to detect an R2 value of at least 0.10 with a 5-percent error probability, implying that this study collects observational data (respondents) from 235 MSMEs. The data was gathered through a questionnaire that included questions about indicators of competence, MSMEs governance, and performance. The questionnaire was then used with direct observation and interviews with MSMEs owners. The distribution of responders is summarized in Table 1.

Table 1. Distribution of Respondents

No	Region	Frequency	Percentage
1	Bandung	96	41%
2	Bandung district	64	27%
3	Cimahi	50	21%
4	Regency. West Bandung	25	11%
Total		**235**	**100%**

Source: Processed by authors

RESULT AND DISCUSSIONS

Discussion of Research Findings (Research Phase 1: Systematic Literature Review)

References are gathered by an exhaustive search of the primary database "Scopus." Reference searches were conducted using the scope, title, abstract, and keywords filters. Initially, 1,872 articles about business management and entrepreneurship were collected. Then, using the phrases "governance" and "MSMEs," we discovered 243 relevant publications. There were 71 references extracted from 243 publications using terms associated with each governance indicator.

1. Definition of Governance

Good corporate governance is meant to protect shareholders' interests while ensuring that the business runs legally and ethically (Anand, 2012). Good corporate governance (GCG) is defined by the Organization for Economic Cooperation and Development (OECD) as justice, accountability, openness, and responsibility (Kholmi, 2020). The National Committee on Governance Policy develops General Guidelines for implementing transparency, accountability, responsibility, independence, justice, and equality in corporate governance. Meanwhile, the General Guidelines for Good Public Governance in Indonesia highlight the concepts of democracy, transparency, accountability, legal culture, justice, and equality.

Numerous studies have demonstrated that governance benefits MSMEs. Governance has the power to make MSMEs even better at what they do, allowing them to grow even more (Hussain & Hadi, 2018; Htay & Salman, 2013; Daw, 2020; Mariani & Panaro, 2012; Sakhdari et al., 2020; La Rosa & Bernini, 2018; Van Den Berghe et al., 2011; Usman et al., 2020; Sarah, 2017; Kurniawati et al., 2018). According to Van Essen et al. (2013), their research utilizing GCG indicators such as cash flow equality and voting rights, the rule of law, and creditor protection demonstrate that a high level of these indicators is highly beneficial for firms during times of crisis.

As previously noted, however, implementation of GCG is considered too expensive and demanding for MSMEs. Aldamen & Duncan (2012) state that governance in small enterprises is purely a burden. So, setting up the right processes and governance standards for small businesses is crucial to keep them from becoming a burden. According to Mahzan & Yan (2014), the current state of MSMEs governance needs to be improved. These problems result from a need for more understanding and high implementation costs. According to Chen et al. (2011), the governance concept has failed to reduce conflicts between majority and minority shareholders, even though the governance concept is intended to reduce conflicts between shareholders and management. Modifications to the GCG procedure are clearly required for MSMEs. It will look at how GCG principles and indicators have been changed to meet the needs of small businesses through a screening process.

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2. Transparency

Transparency is critical for implementation, as stated in the GCG guidebook by the National Committee for Governance Policy. Companies must publish essential and relevant information in an easily accessible and understandable format to maintain objectivity in their operations. Companies need to show not only the facts that are required by law but also information that can help shareholders, creditors, and other people make decisions. The term "transparency" refers to the accessibility of information to stakeholders (Rinaldo & Puspita, 2018; Schnackenberg & Tomlinson, 2016; Zhu, 2004; Bushman et al., 2004; Ball, 2009). Transparency can benefit organizations by assisting employees in changing their behavior (Kaptein, 2008). Alternatively, *transparency* can be defined as the capacity of public members to (a) recognize or become aware of the existence of intellectual assets; and (b) comprehend essential intellectual assets. High-quality information can help people deal with the uncertainty of new situations (Venkatesh et al., 2016; Chen et al., 2016).

According to several definitions, transparency is information availability, clarity, and disclosure to stakeholders, simplifying their decision-making. The perplexing separation of corporate and private assets is one of the transparency challenges plaguing Indonesian MSMEs. MSMEs in Indonesia are unaware of or unconvinced of the importance of segregating personal and corporate assets (Hakiki et al., 2020; Risnaningsih, 2017; Sembiring & Elisabeth, 2018). On the transparency dimension, the governance indicators for MSMEs are shown in Table 2.

Table 2. Indicators of Transparency

No	MSMES Governance Indicators	Rationale
1	The presence of a contract of employment between the firm and the employee	A detailed employment contract between the employer and the employee will give both of them enough information.
2	The separation of personal and corporate assets	Separating personal and corporate assets enables stakeholders to make more informed business decisions.

Source: Processed by Author

3. Accountability

Accountability implies that people held accountable have a responsibility to act following established standards of behavior and that failing to do so will result in consequences (Breaux et al., 2009). Accountability is critical and has been shown to improve job satisfaction. In 2006, the National Committee for Governance Policy published Good Corporate Governance (GCG) standards, requiring that enterprises collect performance data at all company levels using metrics consistent with corporate values. According to Hilb (2005), accountability refers to the appropriateness of actions taken to complete a task, and third parties can quantify compliance. Mero et al. (2007) analyze accountability by applying performance standards such as ratios and job completion targets. Based on expert perspectives and previous study findings, it is feasible to deduce

that responsibility is linked to appropriate work performance and can be evaluated to ensure that all organizational functions operate successfully. The functions of the business include finance, marketing, human resources, and operations, and standards are established in each of these areas to ensure responsibility. These criteria are naturally tailored to the needs of MSMEs in order to avoid being a burden on the business.

a. Financial Function

Financial management refers to acquiring, allocating, and controlling financial resources (Grozdanovska et al., 2017). If the planning, implementation, and assessment stages are successful, the finance function may be tasked with accountability. Regarding financial functions, multiple studies on MSMEs demonstrate that they need more financial records, resulting in adequate financial control and evaluation activities, which is one of the factors contributing to MSMEs' failure to develop. Taking a cue from Yanto et al. (2017) research, financial accounting standards for entities without public accountability (SAK ETAP) have yet to be appropriately applied as accounting regulations for MSMEs. Hamundu et al. (2020) state that clouds accounting adoption could be much higher among Indonesian MSMEs. According to Ismail (2009), managers of MSMEs must acquire sufficient accounting competence to understand their organizations' information requirements better.

Along with insufficient recordkeeping and assessment, MSMEs have financial planning difficulties. According to a survey of entrepreneurial students conducted in 2020, the year the epidemic began in Indonesia, 93% of entrepreneurial students encountered financial difficulties. The issue is that they lack emergency funds for unforeseen events (emergency funds). Based on the research and the concept of accountability, MSMEs should look at these financial function indicators shown in Table 3.

Table 3. Indicators of Accountability (Financial Function)

No	Accountability Indicator (Financial Function)	Rationale
1	The Completeness of financial statements	Due to the fact that financial reports are a control tool, the availability of them has become a way to measure how well control and evaluation activities have worked.
2	The existence of a separate company emergency reserve from personal finances.	An emergency fund is a tool that businesses use to plan for unanticipated situations..
3	The existence of a financial planning system	The financial planning strategy for MSMEs is fundamental. MSMEs must divide money set aside for investment from money set aside for personal expenses, in addition to the emergency funds specified in Point 2.
4	The existence of financial performance appraisal standards	MSMEs can do performance evaluations, at least utilizing the financial information they generate. As a result, the financial function takes the form of assessment as the foundation for present decision making.

Source: Processed by Author

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b. Marketing Function

Marketing management is the art and science of identifying target markets and acquiring, retaining and expanding consumers through the design, delivery, and communication of enhanced customer value. Segmentation, targeting, and positioning contribute to developing a marketing mix plan for product, promotion, place, and price. The marketing process comprises evaluating outcomes and progress against performance targets such as market share. Bocconcelli et al. (2018), through core advertising strategies, segmentation and value creation components, market information management, and marketing mix strategy. Based on these experts' definitions and previous research, it is reasonable to conclude that the following are indicators of the notion of accountability in the marketing function (see Table 4).

Table 4. Indicators of Accountability (Marketing Function)

No	Accountability Indicator (Marketing Function)	Rationale
1	The presence of a defined target market segment	The identification of target market segments will aid MSMEs in developing product, promotion, placement, and pricing strategies.
2	The existence of promotional planning suited to the segment's demands	The appropriate market segment marketing approach can assist MSMEs in gaining a greater market share.
3	The presence of a well-defined pricing strategy	Pricing is one of the most important aspects in determining the success of SMEs. Prices must be adjusted to the target market while taking into account competitive circumstances.
4	The presence of a well-defined and appropriate product distribution plan	Product distribution that ensures products are available at all times and in all places, in line with market needs and wants, is one of the keys to the company's competitive success.
5	Product strategy development programmes are available based on customer categories and demands.	Product quality is tailored to the target market's needs, wants, and purchasing power (segment).

Source: Processed by Author

c. Operation Function

Operational management is any activity involving converting inputs to outputs in producing goods and services. The process begins with product design and development and continues with raw material procurement, production planning, production, sales, and marketing (Mahendrawathi & Nurmadewi, 2021). A *process* is frequently defined as a collection of processes that convert the input to output (AlShathry, 2016). In 1985, Porter classified processes into two categories: core processes and support processes. The term "core processes" refers to those involved in creating value for an organization's products or services. The critical process components are as follows: incoming logistics, operations, outbound logistics, marketing and sales, and services.

Each MSMEs should have accurate data on equipment, suppliers, inventories, workers, and other business activities. According to Bauwman et al. (2018), big data

is critical for assisting businesses in improving their performance. Additionally, data management is critical for the operation of the business. According to several definitions of operations management, table 5 shows the indicators of the concept of accountability in the operations function

Table 5. Indicators of Accountability Operation Function

No	Accountability Indicator (Operation Function)	Rationale
1	The low level of reliance on certain suppliers	A low reliance on suppliers will help to ensure the company's operating procedures.
2	There are established procedures and standards in place for every type of work, from inbound to outbound.	The SOP on each task will make it simpler for employees to carry out their jobs and for management to evaluate performance, resulting in improved operational procedures.
3	The availability of appropriate technology	The availability of relevant technology to assist in making the operating process more effective and efficient.
4	Business data is managed in a methodical manner.	Good data management will be very good for MSMEs in supporting decision making
5	Establish standards for each inventory (Raw Materials, Work in Process and Finished Goods)	Every MSMEs must be aware of raw material, in-process, and final goods standards in order to ensure that productquality is effectively regulated.

Source: Processed by Author

d. Human Resource Function

Human resource management is crucial for every company, especially small businesses relying on people. Human capital is a critical component in helping MSMEs grow (González-Loureiro & Pita-Castelo, 2012). *Human assets* are defined as individuals who possess skills, talents, experience, and professional knowledge. These assets are the "glue" that holds all other assets together and guides their usage toward achieving objectives (Mathis & Jackson, 2017). The human resources department is responsible for developing skill-training materials. Coordinates career goals and staff development activities by organizing training efforts, conducting or arranging off-the-job training, and coordinating career goals and staff development programs. It contributes ideas and abilities to the development of organizations. Chawinga & Chipeta (2017) discovered that skill sets and competitive intelligence significantly impact the ability of MSMEs to generate profits. Kotey & Folker (2007) discovered that human resource training programs affect a business's growth. The leader's function in the company is also critical. Because most MSMEs owners also serve as managers, a MSMEs leader must enhance their capacity to manage the business continually (Miladi, 2014). Experience and training have an effect on the work culture of the organization, and readily available performance measuring instruments can have an effect on employee behavior and outcomes. It should not be disregarded (Wang et al., 2018). According to several of these experts, the following are the governance indicators for the human resource function (see Table 6).

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Table 6. Indicators of Accountability (Human Resource Function)

No	Accountability Indicator (Human resource function)	Rationale
1	The existence of a formal recruitment and selection system	An effective recruiting and selecting process will ensure that the skills, knowledge, abilities, and attitudes of employees are aligned with the organization's requirements.
2	Employee training and development programs that are both continuous and formal are available.	The issue for MSMEs is how to compete, as the quality of human resources available to them is quite restricted. Training programs and continuous human resource development may be used to address these issues.
3	The firm depending on their competencies assigns employees.	It will be more effective and efficient if employees are placed based on their skills..
4	Official job descriptions and specifications are available.	Job descriptions and job specifications aid employees in carrying out routine operations.
5	The availability of a formal evaluation system	MSMEs must have a human resource evaluation system in place in order to select the optimum human resource program.

Source: Processed by Author

4. Responsibility

The National Committee on Governance defines and develops criteria for applying the responsibility principle. According to the National Committee for Governance, businesses must adhere to applicable rules and regulations and their societal and environmental responsibilities to secure long-term economic viability and be considered decent corporate citizens. *First*, the company must follow the precautionary principle and ensure it follows all applicable laws and regulations, its articles of incorporation, and its corporate policies (by-laws). *Second*, businesses must fulfill social responsibilities, such as community service and environmental sustainability, particularly near the firm, through effective planning and implementation. The following are the guidelines for implementation.

Baldo (2012) established a link between the spread of CSR and entrepreneurial ideas, as well as a link between enterprises and their local socioeconomic context. Superior MSMEs, he says, would include environmental considerations in their operations. Additionally, Khan & Badjie (2020) feel that businesses must be aware of environmental, social, and governance concerns and other global endeavors to achieve sustainability. Businesses can increase their short-and long-term profitability and competitiveness by adhering to corporate social responsibility (CSR) requirements (Luken & Stares, 2005). Additionally, Hienerth & Kessler (2006) conclude that MSMEs must pay attention to the environment to flourish. In light of this study's findings, the following are the significant indicators of responsibility in MSMES governance (see Table 7).

Table 7. Indicators of Responsibility

No	Responsibility Indicator	Rationale
1	MSMEs are already legal entities	Clear licensing and legal entities will benefit MSMEs in their development by making funding and market access easier to access.
2	MSMES products have been certified.	MSMEs with certified products have reassuringly provided reassurance to their stakeholders. In other words, they were accountable to their stakeholders.
3	The regularity with which MSMEs pay taxes	MSMEs' tax compliance demonstrates their commitment to the government and society.
4	The attention of SMEs to the environment and society	Keep in mind the environment and social circumstances of the community around you while you run your business. This will help the business run more smoothly with the support of the community.

Source: Processed by Author

5. Independency

The National Committee for Governance developed the GCG guidelines. Companies must be treated independently to guarantee that no one organ of the firm dominates the others. By and large, Indonesian MSMEs are family-owned. The family exerts considerable influence over decision-making. In most family businesses, the whole family is involved in decision-making, frequently resulting in internal conflict (Cosier & Harvey, 1998). Mitter et al. (2014) discovered that family involvement negatively affects small businesses success. When family members are active in management, conflicts among family members emerge (Lee & Rogoff, 1996). Apart from family participation, many MSMEs rely substantially on government assistance, notably in the financial sector. Government involvement benefits MSMEs significantly in obtaining access to financial resources (Khattak & Shah, 2020). According to a survey conducted by the Indonesian government statistics office, capital concerns are the most prominent challenges faced by MSMEs, and they are the primary reason for their failure to develop. Al-Najjar (2017) asserts that a low level of debt reflects a solid MSMEs governance system. According to current research findings, enterprises will be more self-sufficient if family involvement is limited, financial management is superior, and debt levels are low. Thus, based on the principle of independence, the governance measures are shown in Table 8.

Table 8. Indicators of Independency

No	Independency Indicator	Rationale
1	The family's role in management is proportionate to its obligations and requirements, and it does not dominate.	The study's findings indicate that unstructured family interaction has a deleterious effect on MSMEs.
2	The extent to which financial management is autonomous	MSMEs must be financially self-sufficient in order to make business development decisions.
3	The corporation has a low degree of debt.	Financial independence will be assisted by the company's low debt level.

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6. Fairness

The firm's activities must adhere to basic principles and constantly examine the interests of shareholders and other stakeholders in accordance with justice and equality ideals. According to the National Committee for Governance's Basic Guidelines for Good Corporate Governance Implementation, there are some guidelines as follows. First, businesses must provide opportunities for stakeholders to provide feedback and voice ideas that are in the company's best interests, as well as open access to information consistent with the transparency principle within the scope of their respective roles. Second, the firm's stakeholders must be treated equally and fairly in proportion to the benefits and contributions they provide to the organization. Third, regardless of ethnic origin, religion, race, class, gender, or physical condition, the company should give opportunities for hiring, career advancement, and performing duties.

Participation and equitable management practices boost employee productivity (Pérotin & Robinson, 2000). Armstrong et al. (2010) found that diversity and equality management systems improve company performance and decrease employee turnover. As a result, the indicator of fairness may be deduced as follows in Table 9.

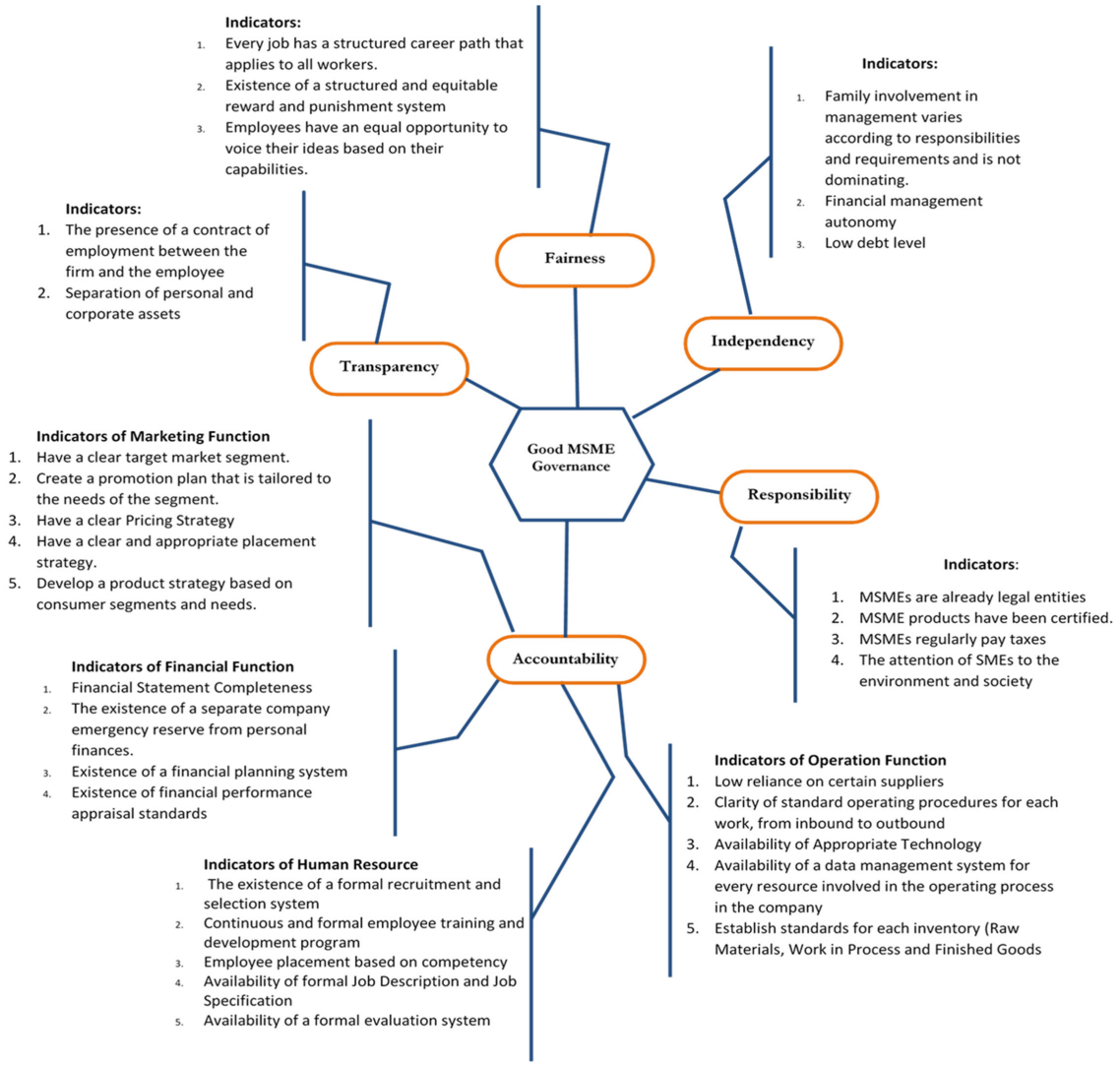
Table 9. Indicators of Fairness

No	Fairness Indicator	Rationale
1	Every job has a structured career path that applies to all workers.	Employees will be more likely to work if the career path is clear and is done the same for everyone.
2	Existence of a structured and equitable reward and punishment system	Employees are more likely to improve their work if the reward and punishment systems are clear.
3	Employees have an equal opportunity to voice their ideas based on their capabilities.	Similarly to principles 1 and 2, every employee, regardless of their position within the organization, has the right to express their thoughts. It is strongly recommended that MSMEs have a means of communication. This benefits the efficient flow of information for MSMEs as well.

Source: Processed by Author

Based on the thorough literature review analysis, it is possible to construct a model of good governance that includes governance indicators tailored to MSMEs. This model can help MSMEs run their businesses in a way that will help them become independent and grow their businesses long-term. Furthermore, additional testing will be conducted on the competency variables of MSME owners and their performance to ensure the effectiveness of the MSMEs governance model's application. As noted previously, the level of competency of MSME owners affects the quality of governance implementation. Figure 3 depicts the MSMEs' governance indicators, while Table 10 details the competency indicators.

Figure 3. Indicators of good MSMEs governance



Source: Processed by Author

The competence of human resources, in this case, owners and managers of MSMEs, is a factor that can contribute to the successful implementation of the governance concept in MSMEs. The HR abilities examined in this study include organizational skills, leadership, self-management, opportunity awareness, analytical and strategic thinking, and personal attributes. These indicators were chosen in response to statements made by numerous experts who have researched these indicators (Aramo-Immonen et al., 2011; Lans et al., 2014; Man et al., 2008; Nikitina et al., 2020). These competency indicators will be used in phase 2 (two) testing to determine which competency factor model is most effective for optimizing MSME governance use and improving company performance.

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Table 10. Indicator of Human Resource

Organizational Skill	Leadership	Self Management	Opportunity Recognition	Analytical and Strategic Thinking	Personal Strenght
Understanding the Notion of Business Organizational Structure	The Influence of a Leader's Role	Ability to manage confidence to achieve the target of the business plan that has been made	The ability to recognise potential business opportunities	The ability to assess a company's success and failure	Able to Face Failure
Understanding of organisational resource management	Directions-Giving Intensity	The ability to manage time effectively in order to complete business plans on time.		The ability to develop strategies for competing in the business industry in which they work	Self-Assurance
	Employee Development Intensity				Flexibility

Source: derived from multiple sources

Research Phase 2 (two). Competency Variable Test on Performance Through MSMEs Governance

The second step of this research examines the effect of competence on the efficacy of applying performance improvement governance frameworks. The second phase of research will involve a survey of 253 Indonesian MSMEs. The SEM-PLS will evaluate MSMEs' competency, governance, and financial performance.

The first stage in the SEM-PLS method is the measurement model test. It was used to ensure the model construct's validity, particularly concerning reflective and latent variables. The metrics employed were factor loading, composite reliability (CR), extracted mean-variance (AVE), and discriminant validity. It is recommended and trustworthy if the loading factor is more significant than 0.708. Numerous loading indicators can be omitted based on data processing findings, including T2 (separation of business and personal assets), which has a CR value of 0.452; I1 (family involvement in business management), which has a CR value of 0.586; I3 (independence in financial management), which has a CR value of -0.448; and P1 (profitability), which has a CR value of 0.571. This is done to strengthen the construction's reliability. Each construct with an AVE greater than 0.50 is acceptable because the concept of convergence may explain item variation. The composite dependability rating is greater than 0.70 in Table 11, with a range of 0.827 to 1,000, suggesting that it exceeds the standard.

Table 11. Loading Factor, Composite Reliability and AVE

Constructs	Item	Loading	CR	AVE
Entrepreneurial Competencies	AST	0.818	0.916	0.644
	L	0.811		
	OR	0.754		
	OS	0.866		
	SM	0.811		
	PS	0.750		
Transparency	T	1.000	1.000	1.000
Accountability	FA	0.627	0.867	0.622
	HA	0.879		
	MA	0.824		
	OA	0.802		
Responsibility	R1	0.754	0.827	0.548
	R2	0.790		
	R3	0.795		
	R4	0.605		
Independency	I	1.000	1.000	1.000
Fairness	F1	0.766	0.872	0.696
	F2	0.804		
	F3	0.925		
Performance	P2	0.920	0.932	0.872
	P3	0.948		

Source: Processed by authors

After deleting the indicators that do not meet the loading factor constraints, a partial test is run to see how the Entrepreneurial Competencies variable affects MSMEs' governance and performance. Table 12 summarizes the test findings.

Table 12. Hypothesis Test

Hypothesis Test	Coeff. Path	T Statistics	P-Values	Conclusion
Entrepreneurial Competency Transparency	0.206	2,649	0,008	Significant impact
Entrepreneurial Competency Accountability	0,170	1,628	0,104	Insignificant impact.
Entrepreneurial Competency Responsibility	0,357	3,619	0,000	Significant impact
Entrepreneurial Competency Independency	0,065	0,791	0,429	Insignificant impact
Entrepreneurial Competency Fairness	0,365	3,667	0,000	Significant impact
Transparency Performance	0,103	1,410	0,159	Insignificant impact
Accountability Performance	0,037	0,463	0,643	Insignificant impact
Responsibility Performance	0,324	4,742	0,000	Significant impact
Independency Performance	-0,038	0,795	0,427	Insignificant impact
Fairness Performance	0,084	0,869	0,385	Insignificant impact
Entrepreneurial Competency Performance	0,160	2,046	0,041	Significant impact

Source: Processed by Authors

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The findings of simultaneous testing of entrepreneurial competency factors through the intervening variable of MSMEs governance, which substantially increases firm performance, also recommend the practicality of the governance model to be used. As a result, this model may be effective, or in other words, MSMEs can adopt the governance model to improve their performance.

Table 13. Simultaneous Testing Result

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Conclusion
Competence, MSMEs governance, Performance	0.172	0.174	0.055	3.097	0.002	Significant impact

Source: Processed by Authors

The partial test results indicate that while specific indicators have no significant effect, they all have a positive coefficient. The higher the competency, the more effective the governance implementation is in promoting MSMEs' performance improvement. This result is consistent with other research demonstrating the critical nature of excellent human resource competency in facilitating the commercialization of an invention (Stephen & Stemshorn, 2016; Koenigsfeld et al., 2012; Som, 2007; Barbazza et al., 2015).

There is just one variable with a negative coefficient, which is the independent variable on performance, implying that the less debt a corporation has, the better its performance. Substantial debt can result in significant interest expenditures, which eat away at earnings. If MSMEs cannot optimize the capital they obtain from debt, the risk of bankruptcy is reasonably high. According to Al-Najjar (2017), low debt helps the governance structure of MSMEs. Nonetheless, the competency characteristics of MSMEs owners have a beneficial effect on increasing the usage of loans in business operations. This result illustrates that those with better competence are more likely to utilize debt in company financing because they understand the debt financing process.

According to data, most small businesses have money problems because they need to learn how to get loans and become bankable (Tambunan, 2018; Purnamawati, 2017). In contrast, MSMEs actors with poor education do not use debt because they need to learn how to obtain it. They usually fail to qualify for loan funding due to a lack of awareness from corporate management.

Human resource competency has a significant and good effect on the indicator of transparency. Competent MSMEs owners would conduct business transparently and equitably, seeking to strengthen employee rights and responsibilities and treating employees relatively from the start, thus increasing job satisfaction and employee loyalty. Competent small business owners will be more accountable to their community, government, and the environment in which their business operates. Additionally, they will ensure that the

products they create are safe for consumers, which enhances the company's image and motivates them to perform better.

Table 14. MSME Governance Implementation Model for Improving Performance

Transparency	Accountability	Responsibility	Independency	Fairness
The presence of a contract of employment between the firm and the employee	**Indicators of Financial Function** 1. Financial Statement Completeness 2. The existence of a separate company emergency reserve from personal finances. 3. Existence of a financial planning system 4. Existence of financial performance appraisal standards	MSMEs are already legal entities	Low debt level	Every job has a structured career path that applies to all workers
	Indicators of Operation Function 1. Low reliance on certain suppliers 2. Clarity of standard operating procedures for each work, from inbound to outbound 3. Availability of Appropriate Technology 4. Availability of a data management system for every resource involved in the operating process in the company 5. Establish standards for each inventory (Raw Materials, Work in Process and Finished Goods	MSME products have been certified.		Existence of a structured and equitable reward and punishment system
	Indicators of Human Resource 1. The existence of a formal recruitment and selection system 2. Continuous and formal employee training and development program 3. Employee placement based on competency 4. Availability of formal Job Description and Job Specification	MSMEs regularly pay taxes		Employees have an equal opportunity to voice their ideas based on their capabilities
	Indicators of Marketing Function 1. Have a clear target market segment. 2. Create a promotion plan that is tailored to the needs of the segment. 3. Have a clear Pricing Strategy 4. Have a clear and appropriate placement strategy.	The attention of SMEs to the environment and society		

Source: Processed by Authors

Meanwhile, the requirement that MSMEs offer is written, and formal explanations of employee rights and responsibilities benefit the transparency variable. If these rights and obligations were aligned, employee loyalty might have improved. These findings corroborate earlier research, which has consistently emphasized the critical nature of corporate transparency (Venkatesh et al., 2016; Chen et al., 2016; Hu et al., 2016). Because it is strongly advised that MSME actors give formal employment contracts to each of their employees, the existence of clarity regarding employees' rights and obligations

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provides employees with certainty over their future. In addition, it can help employees do their jobs better by giving them the groundwork they need to do them.

The owner's level of competence benefits responsibility and performance, but it is insignificant. Although it does not significantly affect all financial, marketing, human resources, and operations indicators, it is acceptable for MSMEs to use it to improve accountability variable performance because these indicators deserve to be included in the model based on the results of the measurement model test. Additionally, a positive coefficient indicates that the presence of this indicator has the potential to improve MSMEs' performance; all that remains is to maximize the application of each of these indicators, which can be accomplished through MSMEs assistance programs that engage academics, government, private institutions, the media, communities, and stakeholders. Business people who have succeeded are welcome to share their knowledge and experiences. According to many studies, responsibility may contribute favorably to a business's success (Grozdanovska et al., 2017; Breaux et al., 2009; Hilb, 2005; Mero et al., 2007).

Each of the indicators in the responsibility variable is also applicable to MSMEs. By honoring MSME obligations to stakeholders, MSMEs' business continuity is enhanced, and expansion is sustained (Baldo, 2012; Khan & Badjie, 2020; Luken & Stares, 2005; Hienerth & Kessler, 2006). For the fairness variable, the model testing findings indicate that MSMEs can utilize any indicators as a starting point for governance implementation. Additionally, some studies have shown that applying fairness principles to the workplace may boost job satisfaction and decrease turnover (Pérotin & Robinson, 2000; Armstrong et al., 2010).

According to the test results, while MSMEs actors in the Greater Bandung area believe that the governance indicators listed in Table 13 are feasible to implement and have been shown to affect performance positively, several indicators, such as the separation of personal and business assets (transparency), family involvement, and the extent to which financial management is autonomous (independence), have not been considered. As a result, governance also needs to be improved, as evidenced by data on the average value of competence and governance. The overall competence component is low; only personal strength and self-management have a value greater than 3, indicating that they are adequate (scale of 1-5). Meanwhile, governance, in general, needs to be improved. Except for the independent variable, which reaches a value of 4.74 (excellent), and the accountability variable for the marketing function, which reaches a value of 3.51 (sufficient), the remainder is deficient (> 3). This result demonstrates the need for increasing MSMEs owners' competency and the importance of intensifying MSMEs assistance programs from various stakeholders, including the government, private institutions, academics, practitioners, communities, and the media. Historically, these parties have collaborated to assist MSMEs, such as academics collaborating with government or private institutions through community service programs, which is one of the academics' obligations but is frequently ineffective. Therefore, with the MSMEs governance standards generated by this research, it is hoped that they can serve as a reference for various parties in the implementation process.

Table 15. Average Grade for Governance and Competency

Variables in SME Governance	Average	Entrepreneurial Competence Variables	Average
Transparency	2,63	Personal Strength	3,12
Financial Accountability	2,75	Organizational Skill	2,78
Marketing Function Accountability	3,51	Leadership	2,92
Human Resources Accountability	2,87	Self-Management	3,25
Operational Function Accountability	2,95	Opportunity Recognition	2,67
Responsibility	3,1	Analytical and Strategic Thinking	2,53
Independency	4,74		
Fairness	2,99		

Source: Processed by Authors

CONCLUSION

The researchers identified indicators of good governance, particularly for MSMEs, using the systematic literature review (SLR) technique. The study's conclusions provide a straightforward solution to the problem of insufficient MSMEs business governance. Some indicators show how well MSMEs are run, which can be used as a guide for managing and growing them. Phase 2 testing, which evaluates the company's competency and performance, determines the model's viability. The results of this test show that the competence variable has a positive effect on business performance through the governance variable, which means that improving the performance of MSMEs requires the use of the concept of good corporate governance, which requires the owner to have enough competence to make it work.

As a result, we strongly encourage MSMEs and other stakeholders, including the government, universities, business practitioners, and private companies, as well as the media, to collaborate in order to assist in the development of MSMEs, particularly in light of research indicating the level of competency of MSME owners in business management is still low, which contributes to their lack of awareness about the critical nature of incorporating the notion of MSMEs governance into corporate management. Referring to the MSMEs governance principles, which are novel in this study, can do collaboration between stakeholders involved in the MSMEs development program.

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The Nexus between Time Management Behaviors and Work-Life Balance of Employees

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Abstract

This research is envisioned to explain the impact of individual time management behaviors on the work-life balance of banking employees. Using the positivist paradigm, a self-administered survey was chosen to collect responses from bank employees across Sindh, Pakistan. The presented hypotheses were supported by quantitative analytical techniques that tested causal links between all constructs. A total of 450 questionnaires were administered, out of which 320 valid responses were analyzed using PLS-SEM. The findings validated that individual time management behaviors do contribute to attaining work-life balance in the banking sector. Results revealed a positive effect of goal setting and priorities, time management mechanics, and organization preference on employees' work-life balance. Among all, mechanics of time management (MTM) substantially impact achieving work-life balance. This research will aid in the identification of time management practices that are better capable of balancing work and life.

Keywords:

goal setting and priorities; mechanics of time management; preference for organization; work-life balance

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INTRODUCTION

Our society is characterized by perpetual dynamics and transition. In recent decades, corporate practices have changed profoundly. Workplaces have altered dramatically as a result of structural changes and technology improvements (Zahoor et al., 2021). More than a capacity burden, uncertainty in the identification of roles and responsibilities, lack of ability to govern resources, loss of decision-making autonomy, and disparities in work and personal life are all consequences of these changes. Efficient businesses are concerned with recruiting, rewarding, and retaining better people who are preoccupied with doing their jobs well and adapting to changing work needs (Kirkland et al., 2017). Historical and modern work-life research has frequently highlighted that appropriate management of the interaction amid work and family life remains a critical motivator for employers and workers across many organizational settings (Le et al., 2020).

Work-life balance is about adjusting to specific circumstances to help people meet their commitments and goals that benefit the individual, business, and society at large. This implies that people should have some autonomy over their work schedules, locations, and methods (Chanie et al., 2020). Due to increased worldwide competitiveness and demands for immediate access to products and services, efficient time management has become an essential component of the work (Mukhtar et al., 2020). Individuals who engaged in specific time management behaviors free up their cognitive resources that can be utilized for other tasks and lessen the hoarding burdens of work and life responsibilities (Beigi et al., 2018). Effective time management is required to stay up with this competitive setting and achieve an ideal degree of work-life balance. Time management practices have received a lot of attention in the workplace during the last several decades (Azar, 2017). Individuals may utilize the approaches that fit them and their lifestyle to begin becoming incredible time managers by focusing on spending minutes and hours as efficiently as possible throughout the day (Channar et al., 2014). Time management may aid and increase people's learning and job productivity, as well as help to a work-life balance (Haralayya, 2021).

Time management is the activity of determinedly managing and measuring the time consumed on particular doings to work more wisely rather than furiously (Angelici & Profeta, 2020). Time management is inextricably tied to the effectiveness component rather than the efficiency component since effectiveness is defined as choosing the appropriate thing to accomplish at the right time, which is more essential than doing things correctly (Mukhtar et al., 2020). Individual time management strategies, both explicit and tacit, are a critical component of how professionals accomplish projects within their daily schedules (Grissom et al., 2015). Effective time management may be measured as a holistic concept, yet it involves a variety of distinct actions and attitudes that demonstrate good self-regulation abilities. Time management is a self-disciplined effort to use time in a relatively effectual manner to accomplish goals that promote the individualized approach and differences of these activities (U$\breve{g}$ur & Güngör, 2021). This research looks at three distinct types of time management behaviors. Macan (1994) defines these behaviors as goal setting and prioritizing (GSP), time management mechanics (MTM), and preference for organization (PFO). Each of the three-time management behaviors is different and equally significant. As a result, all three-time management behaviors will be examined in this study.

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Goals are arbitrary and indicate future outcomes that motivate people to put forth extra effort (Bajec, 2019). Personal success hinges on the achievement of a goal. The establishing of objectives concerning individual needs or desires and the prioritization of actions needed to attain these goals is how time-based behavior may be characterized in terms of goal setting and priorities (Macan, 1994). Goal setting is a sort of time management in which objectives are clarified, managed, and translated into time-management practices (Weintraub et al., 2021).

Planning is the first and most important criterion for good time management (Azar, 2017). Planning behavior may be thought of as a specific technique of goal setting. By providing distinct targets for people's energy, goals can improve effort and attention (Dulas, 2021). Because it is difficult to rewind or restore time, preparation can assist to reduce errors and deficiencies. A comprehensive examination of the literature reveals that goal-setting/planning behavior is critical in time management. Without goal-setting techniques, a time management system is insufficient (Bajec, 2019). Prioritization is linked to planning. Prioritizing means making a list of activities to do and ranking them in order of priority, and then devote more time to the most important ones (Dimitrova & Mancheva-Ali, 2018). People should be mindful of their priorities so that they can utilize their productive time to do the critical or most important tasks. Persistent planning and time management results in higher work quality, a better social life, and a more structured personality (Aeon & Aguinis, 2017). For this research, planning refers to the method of reaching the desired results through establishing objectives. It entails breaking down large activities into smaller manageable tasks and assessing individual work efficiency (Azar, 2017; Chanie et al., 2020; Dulas, 2021).

Another aspect of time management behaviors is time management mechanics. The actions commonly linked with managing time, such as making lists, scheduling, and planning (Macan, 1994). The mechanics of time management behaviors refer to the incorporation of time management activities taught via books and training (Wolters et al., 2017). To effectively manage time, it is necessary to first enhance time awareness. This may be accomplished by sticking to a timetable (Le et al., 2020). Creating a "To-do" list is one of the most effective ways to do this. Lists are a very helpful approach. Macan (2010) also emphasized the urgency and relevance of your To-do list tasks. It's crucial to remember that the items on your to-do list must be prioritized. A to-do list should be reasonable and not overly extensive (Dhas, 2015). A to-do list is an important time management tool that allows employees at the managerial, supervisory, and operational levels to manage all activities to boost job efficiency and reduce stress.

Technology is among the important aspect of time management mechanics. The basic premise of time management has stayed the same, but with the advent of technology, it has been simpler to manage time, such as with cell phones. Calendars, reminders, PDAs, mobile phones, and smartphones are just a few of the devices on the market that helps with good time management. Smart employees may complete the same tasks and activities as ordinary workers and achieve the same set of objectives and outcomes by utilizing technology while choosing a workspace and schedule that is more convenient for both the job at hand and their personal needs (Gillespie et al., 2012). Time and space

flexibility provides a new work structure that is centered on outcomes rather than office presence and works during specific hours (Angelici & Profeta, 2020). Cijan et al. (2019) support the idea that technology increases people's autonomy and the functioning of work, as well as allows them to successfully integrate numerous life roles. Time management tools and approaches help employees perform better at work by allowing them more time to complete higher-priority activities (Kayen et al., 2012). The mechanics of time management are largely behavioral, reflecting one's adoption of certain time management strategies. Mechanics of time management are more inclined towards actions that may result in maintaining harmony between the conflicting domains of work and personal matters (Angelici & Profeta, 2020).

Preference for organization is one of the factors that create and increase Time Management (Adams & Blair, 2019). There are two main components to organization: arranging things and managing time. Both are required to reach your goals. It's difficult to tell the difference between vital and simple chores. One of the most important aspects of the organization is scheduling. If one can learn to organize life to some extent then he/she will be more driven to achieve in the long run (Macan et al., 2010). The preference for organization is mainly holding an attitudinal nature that reflects individual differences towards completing activities in a structured manner. Various studies have shown that people who maintain order and organization preferably use better time.

This research study laid its theoretical foundation on self-efficacy theory. Self-efficacy theory refers to a person's conviction of his/her capability to complete tasks, accomplish their goals, and obtain what they or desires. This theory posits that individual behaviors and beliefs influence one's capabilities to act in a certain way. The current study focuses on the notion that keeping a balance in work and life domains is a self-management competency (Beigi et al., 2018). This research focuses on people's core beliefs about themselves, including their ability to manage their time to strike a balance between job and life. Although the positive impact of work-life balance is well documented in the literature, little attention has been given to the self-regulation strategies and competencies that can influence and predict this balance. According to the integrative review done by Sirgy & Lee (2018), individual characteristics and cultural beliefs are determinants of work-life balance. Macan (2010) also mentioned that time management distinctly impacts individuals.

Several studies mentioned the importance of coping behaviors in shaping work-life balance (Adkins & Premeaux, 2019; Azar, 2017; Bley, 2015; Caringal-Go et al., 2022). Caringal-Go et al. (2022) also highlighted the need to delineate the impact of coping behaviors (e.g. time management) in crafting work-life balance. Time management as a self-regulatory method may be connected to work-life balance under domain-specific conditions. Consistent with theories claiming that WLB is domain sensitive, the cross-cultural differences in work-life balance are frequently mentioned in WLB literature (Soomro et al., 2018). This is another contribution of this study. As work and life challenges are not exclusive to the West; Pakistan, as a developing country, has no exception (Soomro et al., 2018). The majority of WLB research has been conducted in Anglo-Saxon and Western European nations. The way eastern nations, particularly those in Asia, regard work and family differs from how western countries perceive them. This

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is related to cultural variations, family arrangements, and social institutions (Le et al., 2020). It is necessary to investigate work-life balance in greater depth so that the findings of the studies can be applied to the Pakistani context. Besides this, current study focused on individual time management behaviors rather considering it as a holistic construct.

Although the relationship between time management and work-life balance has been researched extensively earlier studies have considered time management as a composite factor and did not focus on individual behaviors. Few latest research work also emphasized the importance of individual time management behaviors (i.e. goal setting and priorities, mechanics of time management, preference for organization) toward the attainment of specific objectives (Adkins & Premeaux, 2019; Aeon & Aguinis, 2017; Beigi et al., 2018; Haralayya, 2021). This emerges the need to conduct this study. This will provide a true picture concerning the behaviors that contribute to work-life balance. Therefore, the current study is intended to examine the impact of individual time management behaviors on work-life balance in the banking sector of Pakistan. The findings of the current study will have implications for organizational leaders and HR practitioners to better cope with the challenges and changing requirements of the workplace.

METHODS

The current study's approach is based on positivist ideology (Rahi, 2017). The quantitative technique was used for empirical testing since the link between the variables is hypothesized and variables exist in prior research and theories. This research study used a cross-sectional method to collect data using a self-administered questionnaire. Employees of the banking sector were the unit of analysis. The reason for choosing banks as the target market is that work-life balance is a serious concern in this industry.

The study used the purposive sampling technique. Preexisting validated research instruments were applied to measure the research variables. The study's data were gathered using the GSP, MTM, PFO, and WLB scales. The ratings for each scale's items range from 1 to 5, with 5 being the strongest agreement. There are two sections to the survey questionnaire. The former is related to the demographic details of study participants. Gender, age, education level, job title, and tenure are all covered in this data. The latter consists of information related to the variables of the study. Scales of Goal setting and priorities (GSP), mechanics of time management (MTM), and preference for the organization (PFO) were adopted from the Time management behavior scale (TMBS) fabricated by Macan (1994). TMBS is a widely used questionnaire to assess the time management of individuals (Romero & Barberà, 2015).

A total of 361 (80.2%) questionnaires were obtained out of 450, which were used for final data analysis. After receiving consent from workers and ensuring confidentiality on the side of the participants, all surveys were completed. Furthermore, Harman's Single Factor test is utilized to discover biased replies in the surveys, as recommended by Podsakoff et al (2003). According to the test, the variance value was 33.45 percent, which was less than 50 percent, suggesting that the survey questionnaire data did not contain biased replies (Podsakoff et al., 2003). The proposed hypotheses

were examined using PLS-SEM. Smart PLS is an appropriate software to analyze survey questionnaires as it can provide latent variable scores, nullify small sample problems, as well as evaluate formative and reflective frameworks with multiple latent and manifest variables, the Smart-PLS is being used to analyze survey questionnaire data.

The Smart-PLS is used to assess survey questionnaire data because it can provide latent variable scores, eliminate small sample size issues, and estimate reflective and formative models with several latent and manifest variables (Henseler et al., 2009). The following is the data analysis method: Confirmatory factor analysis was used to confirm the instrument's validity and reliability. Second, standardized betas (β) and t-statistics were used to evaluate the structural model. Finally, the R2 value was used as a measure of the model's overall predictive power (Henseler et al., 2009).

RESULT AND DISCUSSION

As shown in Table 1, the large percentage of survey participants, 260 (72.0 percent), were men. In terms of age, 47.1 percent of survey participants were between the ages of 31 and 40. Table 1 also revealed that 49.3 percent of respondents had Master's degrees. 35.4 percent of participants worked in banks for one to five years. A significant proportion of responders (54.0 percent) are officer-level employees.

Table 1. Respondents' Demographics Summary

	Frequency	Percentage
Gender		
Male	260	72.0
Female	101	28.0
Age		
21-30 years	117	32.4
31-40 years	170	47.1
41 and above	74	20.5
Qualification		
Undergraduate	68	18.8
Graduate	105	29.1
Masters	178	49.3
Others	10	2.8
Tenure		
Below 1 year	95	26.3
1 to 5 years	128	35.4
6 to 10 years	101	27.9
11 years and more	37	10.2
Designation		
Clerical Level	86	23.8
Officer Level	195	54.0
Executive Level	80	22.2

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As proposed by Henseler et al. (2009), this study employed a two-layered analytical approach to evaluate and describe the results of the PLS-SEM path. This two-layered analytical approach first assesses the measurement model that is then followed to test the structural model. To evaluate the measurement model of the employed scales, individual item reliability, internal consistency, and discriminant and convergent validity are assessed (Hair et al., 2017; Henseler et al., 2009). The factor loadings for the variables in their respective constructs in the model were more than 0.70, indicating that all constructs fulfilled the convergent validity analysis criterion (Henseler et al., 2009).

The results of discriminant and convergent validity are displayed in Table 2. All of the constructs' average variance extracted (AVE) values above 0.5, demonstrating that they meet the necessary standard for convergent validity (Fornell & Larcker, 1981; Henseler et al., 2009). All constructs met the requirement for discriminant validity since their AVE square root values in the diagonal exceeded the squared correlation with other constructs in the off-diagonal (Henseler et al., 2009).

Table 2. Discriminant and Convergent Validity

Construct	AVE	1	2	3	4	5
GSP	0.59	**0.768**				
POS	0.622	0.206	**0.765**			
PFO	0.664	0.091	0.195	**0.815**		
MTM	0.585	0.230	0.561	0.078	**0.789**	
WLB	0.562	0.481	0.627	0.388	0.743	0.749

Table 3 presents descriptive statistics and VIF. The mean of the variables ranges between 3.60 and 4.25 having the standard deviation ranging from 0.65 to 0.88. The results of the variance inflation factor show values below 5.0 indicating that the data is not having multicollinearity issues (Hair et al., 2017). Additionally, the composite reliability is having values greater than the standard value of 0.8, representing that all the constructs possess high levels of internal consistency. Overall, the statistics validate that the measurement model has fulfilled the required validity and reliability criteria.

Table 3. Descriptive Statistics, Collinearity Diagnostics and Reliability Analysis

Construct	Mean	Standard deviation	Variance Inflation Factor	Composite Reliability
GSP	4.21	0.68	1.209	0.935
MTM	3.80	0.88	1.501	0.948
PFO	3.61	0.85	1.047	0.941
WLB	3.76	0.73		0.950

The second stage is to examine the present study's structural model after examining it on a measurement basis. The current study employed the typical approach of bootstrapping using 5000 bootstrap samples for this aim. The significance value of the path coefficients

is determined using this bootstrapping approach (Hair et al., 2017). Table 5 displays the outcomes of the proposed model's hypothesis testing.

The first hypothesis predicted that GSP is positively related to employees' WLB. The findings (Table 4) show that both variables are positively related (β= 0.287, t =10.495, p<0.05). As a result, there is sufficient evidence to support Hypothesis (H1). These outcomes match with the existing studies that goal specificity provides a road map to achieving defined objectives (Gröpel & Kuhl, 2006). Evidence suggests that setting goals and priorities is a crucial step in sustaining one's wellbeing. When opposed to more generic "do your best" demands, specific objectives serve as both cognitive and behavioral ways of directing attention and effort toward activities related to achieving the goal and away from behaviors that are irrelevant to achieving the goal, therefore boosting work-life stability.

Table 4. Full Structural Model

		Beta	SD	t-stat	P-values	Results
H1	GSP →	0.269	0.026	10.244	0.00	Supported**
H2	MTM →	0.539	0.031	17.363	0.00	Supported**
H3	PFO →	0.263	0.025	10.544	0.00	Supported**

The second hypothesis anticipated that MTM had a significant relationship with WLB. The results (Table 5) show that TMB is directly correlated with employees' WLB (β=0.539, t=17.363, p<0.05), which supports Hypothesis (H2). The outcomes support the conclusions of (Bley, 2015), which explains that individuals can develop MTM skills as a means to handle the workload. Likewise, while assessing the impact of PFO on WLB (H3), the results revealed that preference for organization is significantly linked to employees' work-life balance (β= 0.263, t =10.544, p<0.05), thus supporting Hypothesis (H3). This finding of (H3) validates the point that maintaining a methodical and organized approach to work lessens the probability of work-related conflicts and thus contributes to WLB (Baltes et al., 2010; Soomro et al., 2018).

Moreover, R^2 and effect sizes are tested. The suggested model accounted for 77.8 percent of the total variation in WLB. This means that the three sets of predictors (GSP, MTM, and PFO) explain 77.8 percent of the variance in work-life balance. According to the results in Table 5, the effect sizes for GSP, MTM, and PFO on WLB were 0.345, 0.862, and 0.132, respectively. Consequently, according to Cohen's (1988) standards, the effect sizes of these three exogenous latent variables on an endogenous variable are moderate, large, and small, respectively.

Table 5. Effect Sizes of the Latent Variables on Cohen's (1988) Recommendation

Construct	f^2	Effect Size
GSP	0.345	Moderate
MTM	0.862	Large
PFO	0.132	Small

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This study has examined the relationship between individual TMB and WLB. According to the study findings, time is a crucial factor that requires immediate attention owing to its favorable impacts on keeping a healthy working environment. The blurring line between work and personal life is accelerating the use of time management strategies as the only way to respond to this issue. The study also supports the notion that certain behavioral techniques for managing one's time are strongly related to the cognitive activity of setting objectives and rating tasks in terms of priority. Individuals have both long-term and short-term priorities. In many cases, short-term chores or goals substitute long-term aspirations, causing people to never attain their life goals. In addition to completing urgent duties, it is critical to strive for long-term goals. In one's lifetime, one should elevate his goals to greater priority.

Its importance is magnified in a nation like Pakistan, where time is not regarded as an important factor. Time management tactics can assist you to handle work interference in your personal life as well as personal interference in your job. These can be used as a competitive strategy by organizations. Moreover, our results are stronger for time management mechanics. Consistently with Azar (2017) suggest that the flexibility introduced by using the mechanics to manage time may contribute to reducing work and life disparity.

This research also provides two major implications i.e. theoretical implications and practical implications. First, this research has presented theoretical implications by providing additional evidence on self-efficacy theory. Self-efficacy theory usually applies to a certain ability that is linked to the processes of self-regulation by selecting the appropriate goals or approach. The results of this study will help to extend the concept of self-efficacy in the time management context. Second, this research extends the theory by evaluating individual TMB. In particular, the ongoing study sought to determine how individual time management behaviors in Pakistan's banking industry help to attain a WLB. The study's findings have offered substantial support for major theoretical assumptions. Third, the dearth of literature in this domain is qualitative. Therefore, this study has provided useful insights by examining these relationships empirically.

As per practical implications, management to advance the work-life balance of employees may apply the results of this investigation. To attain this goal, management should focus on the following factors: First, organizations should arrange training programs to enhance the time management skills of employees. Second, employees value employers who empower them to manage their own time. Therefore, organizations can provide flexibility by engaging them in determining their work schedules. Additionally, organizations can help employees in managing their time by limiting interruptions. Pre-planned work schedules guide in determining the priorities so one can spend time on important tasks. Third, organizations should incorporate technology that can help balance time-related issues. Utilizing the available time in the best possible way seems to be a promising approach for a more efficient organization of work.

CONCLUSION

This study advances the contemporary realm of research on WLB. This article has notable implications since it discusses the linkage of individual time management behaviors and the work-life balance of banking employees of Pakistan. Following the findings of the study, a considerable positive association exists between time management behaviors and work-life balance. This research is particularly useful in terms of system, capacity, and pattern delivery recommendations, which may help with time management. Getting a better understanding of specific time management behaviors is vital to provide support to face the challenges of work and personal life misalignment. As a result, this study means demonstrating learning opportunities to spend resources efficiently. To conclude, organizations must work on their policies and practices regarding work-life balance by employing time management strategies on the individual and organizational levels. Also, time management training can be used as a constructive strategy. Organizations can help the employees through the inclusion of in-service training programs to enhance their ability to manage time.

Despite having a lot of strengths, this study has some limitations too. As management practices vary from organization to organization, the level of time management is also diverged across individuals belonging to different cultures. This leads to the generalizability issue of the study findings as it focused only banking sector in Pakistan. It is suggested that future research can be done on other industries in different geographical locations. Also, comparisons of several industries might give valuable insights into one country. Another limitation is due to the data collection method i.e. cross-sectional method; future studies can evaluate the model using time-lagged data.

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Mediating role of Environmental Education for Sustainable Supply chain Performance: Empirical Evidence from Chemical Companies of Pakistan

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Abstract

Previous studies have been conducted in developed countries, and only a few are conducted in developing countries. Furthermore, a contribution of this is that the mediating role of environmental education is considered in the present study. This study aimed to identify the mediating role of environmental education between internal environmental management, supplier selection, and green packaging on sustainable supply chain performance in Pakistan. A total of 250 chemical companies filled out the questionnaire. The findings of this study revealed a partial mediation effect of environmental education for internal environmental management, supplier selection, and green packaging in sustainable supply chain performance in Pakistan. However, the supplier selection results are more critical compared to internal environment management and green packaging due to the higher beta value. This study proposed a pivotal variable to achieve a sustainable supply chain in developing countries such as Pakistan.

Keywords:

environmental; education; sustainable; supply chain; performance

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INTRODUCTION

There are various challenges including health, environmental and socio-economic are faced by society due to industrial toxic, ineffective waste management and air pollution from industrial sector in developing countries is noticed (Elfithri & Mokhtar, 2018). These issues also lead to serious concerns about the health and safety risks to workers. All-environmental related problems can be addressed to some extent through green practices in both developed and developing countries (Kannan et al., 2019). In the current competitive environment, the majority of manufacturing companies are adopting green supply chain practices due to pressure from the local community in which areas they are operating (Sezen & Çankaya, 2018). Green packaging cannot be ignored related to value chain components, which has direct effect on sustainable supply chain performance (Sarkis, 2003). Number of green packaging practises inculding eliminating excessive packaging,, simple packaging and easy disassembly are related to green supply chain (Kung et al., 2012). Internal environmental management can be said to be the firm's own internal policies and their implementation to achieve sustainable environment (Chan et al., 2012). The success is only possible when all levels of the employee are involved at the same level with the same objective from the top level to the lower level (Zhu et al., 2005). Past empirical studies revealed their academic research on environmental education for sustainable supply chain performance (Sarkis et al., 2010; Sammalisto & Brorson, 2008). Environmental education is having important role in changing the attitude of employees towards the environment (Sammalisto & Brorson, 2008). Supplier selection is also play a key role for sustainable supply chain performance because it determines the right selection of suppliers that carry their environmentally friendly processes in their operations (Min & Galle, 2001; Paulraj, 2011; Tseng & Chiu, 2013).

The sustiability paid attention by researchers and they started to produce publications on this issue after 1987. In these publications they clarily stated that the safety should be maintined for the surivial of future generations with better standard of living. There are three key diminsions of sustainbliity are studied in the past studies such as economics, environmental and social performance. However, due to complexity of business operations such as supply chain operations from raw material to deliveriy of goods and services to end-customers is not easy to achieve in today's competitive market. Therefore, keeping in view, the past studies in the filed of academica published many papers on green supply chain in order to obtaining the sustainable development in their respective areas (Sarkis et al., 2011; Green et al., 2012). The green supply chain is an important issue which must be addressed in multidisciplinary areas (Eltayeb et al., 2011). There are many environmental problems that are casuing the global warning, including environmental pollution, negative impact on biological diversity, reduction of natural resouces so on. Fact of matter is that these problems are end product of companies operations including supply chain operations, which develop a great pressure from both community and government as well (Walker et al., 2008). Therefore, the green supply chain management is one of the solution in order to address these problems (Adriana, 2009).

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In the past many studies have been conducted in regard to green supply chain management practices in economic and environmental dimensions. Here, a few studies are mentioned which examined the impact of green supply chain management practises on economic performance (Younis et al., 2016; Schmidt et al., 2017, Zhu et al., 2013). Similary, on environmental performance (Chien & Shih, 2007). However, the important area sustainanble supply chain performance is not studied in above mentioned studies. In this regard, there are theortical and methodological contributions of present study. First methological contributions in this study is, it is suggested by Geng et al. (2017) & Chao (2020) developing countries should be studied in the context of sustainable supply chain. Therefore, the major cities of Pakistan have been targeted including Karachi, Lahore and Quetta for better representative of sample size from Pakistan as a developing country. Second methological contributions in this study is, similar study conducted in India with only 107 sample sizes (Ghosh et al., 2021). However, the present study increased the sample size from 107 to 250 in order to verify the previous study's findings. One theortical contribution of present study is that the mediation effect of environmental education is checked. Based on limited knowledge of the authors, this is a first study that checked the mediating effect of environmental education in the context of sustainable supply chain performance in the chemical companies of Pakistan. Therefore, the objective of the study to examine the mediating role of enviormental education for sustainable supply chain performance in chemical companies of Pakistan.

METHODS

This study is based on primary data which is collected through a adopted questionnaire from past studies and a survey method is applied. The respondents were requested to fill google form online questionnaire and link of questionnaire were shared via various social media platforms including WhatsApp, e-mail and facebook with concern HR department due to their privacy concern policy. The environmental management is an important due to global warming situation among world. Furthermore, it is suggested by Zhu et al. (2013) & Esfahbodi et al. (2017) that the manufacturing companies in developing countries in context of sustainable supply chain performance must studied. Therefore, in the present study, chemical companies which are related manufacturing sector are considered as the population of present study. Employees from both the middle level and the upper level requested to fill the questionnaire voluntary. The name of employee were not disclosed. Data gathered from March 2022 to May 2022 (three months). Total 300 questionnaire were distributed among employee who are working the chemical companies of Paksitan. However, only 250 questionaire were considered after data cleaning process by the authors. Therefore, the response rate for this study is 83 percent. Most of the time is suggested by Pagell et al. (2004), the response rate in supply chain management is acceptable upto 20 percent.

In this study AMOS (analysis of moment structures) is used to conduct two important tests such as confirmatry factor analysis and covariance-based structural equation modelling (CB-SEM). The proposed hypothesis are tested with help of bootstrap procedure

which is recommended for data is analysed (Enders, 2005). Furthermore, structural equation modelling is also suggested for mediation effect as well (Cheung & Lau, 2008). First of all in this study, the measurement model is tested to find the convergent validity and reliability of collected data. Second, CB-SEM analysis were performed for testing the proposed hypthteis (Hair et al., 2012).

The green packaging items were adopted from past of Shang et al. (2010). Research items including "Reduction of packaging materials, Ecological materials for primary packaging, Recyclable or reusable packaging/containers in logistics, Packaging made from materials healthy in all probable end-of-life scenarios". The internal environmental management scale developed by Zhu et al. (2007). Research questions are "Commitment of GSCM from senior managers, Cross-functional cooperation for environmental improvements", Support for GSCM from mid-level managers", "Cross-functional cooperation for environmental improvements". The supplier selection is taken from the study of Paulraj (2011). Sample research items are "We select suppliers based on their environmental competence", Suppliers are selected based on their ability to support our environmental objectives", We select suppliers based on their technical and eco-design capability", "We select suppliers based on their environmental performance".

The environmental education is adopted from the study Wang & Chiou (2010). Research items are "Periodic updating of the website on environmental issues, Natural environmental seminars for executives, sponsoring of environmental events/collaboration with ecological organizations, Holding awareness seminars for suppliers/contractors". Lastly, the sustainable supply chain performance is adopted from the study Chowdhury (2014). Research questions are "We take adequate measures to control air pollution, we control the use of hazardous materials and chemicals (lead, Azo or other banned chemicals etc.) in products, we have environmental certification and audit, we evaluate the environmental performance of suppliers".

RESULTS AND DISCUSSION

Table 1 shows the demographics of the respondents which are divided into frequency and percentage. The total number of respondents are 250 where gender of respondents in which, male is 151 or 60.4% and female are 99 or 39.6%. Age of respondents in which, 18-24y are 33 or 13.2, 25-29y are 68 or 27.2%, 30-34 are 24 or 9% and 35 or above are 125 or 50.8%. Education of respondents in which, Intermediate holders are 18 or 7.2%, Bachelor's holders are 150 or 60% and Master holder are 82 or 32.8%.

It is suggested by Hair et al., (2014) that the before testing the hypothesis the instrument's (questionnaire) validity and reliability must be checked. Similarly, Anderson & Gerbing (1988) also highly recommended to check the validity and reliability before testing the proposed hypothesis. You can notice the measurement of model of this study is shown in the Table 2. All research items and extracted average variance values fall more than the recommended value of 0.50 (Hair et al., 2014). The highest research item is 0.933 and highest AVE is 0.78. Furthermore, the lowest research item is 0.518

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and lowest AVE is 0.50. Lastly, the composite reliability is also ranges from 0.71 to 0.93. The suggested value is that it should be more than 0.70. Therefore, for this study validity and reliability is obtained and second phase (hypothesis testing) can be conducted in order to conclude the findings of present study.

Table 1. Demographics of Respondents

		Frequency	Percentage
Gender	Male	151	60.4
	Female	99	39.6
Age	18-24	33	13.2
	25-29	68	27.2
	30-34	24	9.6
	35 or above	125	50.0
Education	Intermediate	18	7.2
	Bachelors	150	60.0
	Masters	82	32.8

Source: Author's Calculations

Table 2. Convergent Validity and Reliability

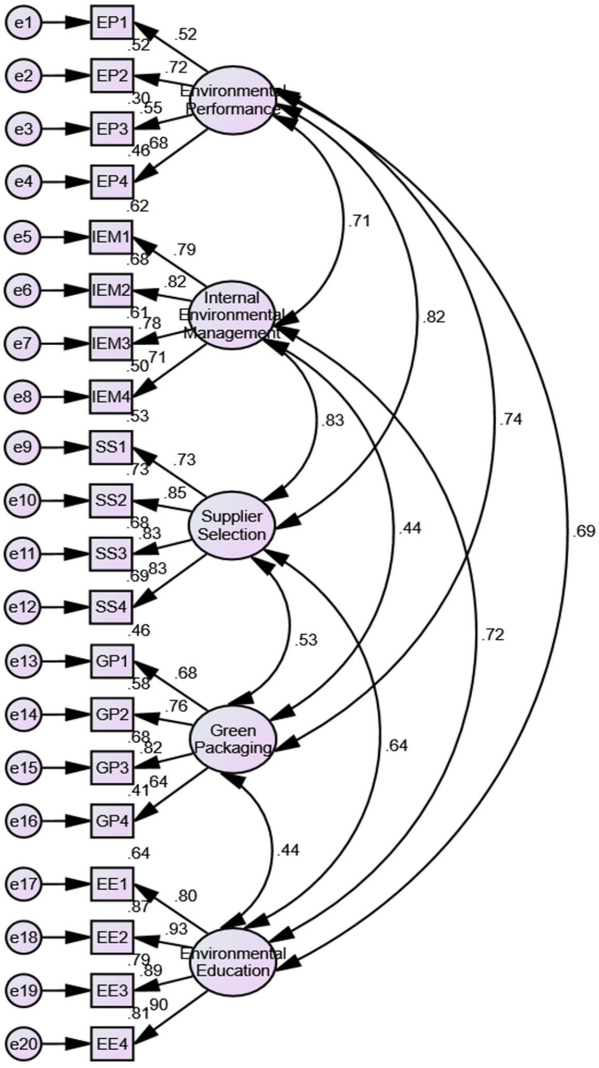
Factor	Item	Standardize Items	Composite Reliability	AVE
Internal Environment Management	IEM1	.787	.86	.60
	IEM2	.823		
	IEM3	.779		
	IEM4	.709		
Supplier Selection	SS1	.726	.88	.65
	SS2	.851		
	SS3	.826		
	SS4	.828		
Green Packaging	GP1	.676	.82	.53
	GP2	.760		
	GP3	.825		
	GP4	.638		
Environmental Education	EE1	.801	.93	.78
	EE2	.933		
	EE3	.890		
	EE4	.901		
Sustainable supply Chain Performance	SSCP1	.518	.71	.50
	SSCP2	.724		
	SSCP3	.547		
	SSCP4	.679		

Source: Author's Calculations

Table 3 shows that there are three effects including total effect, direct effect and indirect effect. The value of beta and significant value are .181, .101, .080 and .027, .000 and .001 respectively. Therefore, the partial mediation effect of environmental education in

the present study is revealed between internal environmental management and sustainable supply chain performance. Furthermore, the beta value is also reduced from .101 to .080 in the presence of mediator environmental education and was also found to have a significant impact (p-value =.001). Therefore, the partial mediation effect confirmed and the three proposed hypotheses H1a, H1b, and H1c are supported.

Figure 1. Confirmatory Factor Analysis (CFA)



There are three effects that can be seen in the Table 4 including total effect, direct effect and indirect effect. The beta value and significant value are .379, .335, .044 and .000, .000 and .001 respectively. Therefore, the partial mediation effect of environmental education in the present study is revealed between supplier selection and sustainable supply chain performance. Furthermore, the value of beta is also reduced from .335 to .044 in presence of mediator environmental education and found to have significant impact (p-value=.001) as well. Therefore, the partial mediation effect was confirmed and the three proposed hypotheses H2a, H2b, and H2c are supported.

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Table 3. Convergent Validity and Reliability

Hypothesis	Directions of Paths (SEM)	Path beta value	P-value	Remarks
H1a	IEM->SSCP	.181	.027	Supported
H1b	IEM->SSCP	.101	.000	Supported
H1c	IEM->EE->SSCP	.080	.001	Supported

There are three effects that can be seen in the Table 4 including total effect, direct effect and indirect effect. The beta value and significant value are .288, .271, .016 and .000, .000 and .047 respectively. Therefore, the partial mediation effect of environmental education in the present study is confirmed between green packaging and sustainable supply chain performance. Furthermore, the value of beta is also reduced from .271 to .016 in presence of mediator environmental education and found to have significant impact (p-value=.001) as well. Therefore, the partial mediation effect was confirmed and all three proposed hypotheses H3a, H3b, and H3c are supported.

Table 4. Supplier Selection (Mediation effect)

Hypothesis	Directions of Paths (SEM)	Path beta value	P-value	Remarks
H2a	SS->SSCP	.379	.000	Supported
H2b	SS->SSCP	.335	.000	Supported
H2c	SS->EE->SSCP	.044	.001	Supported

Table 5. Green Packaging (Mediation effect)

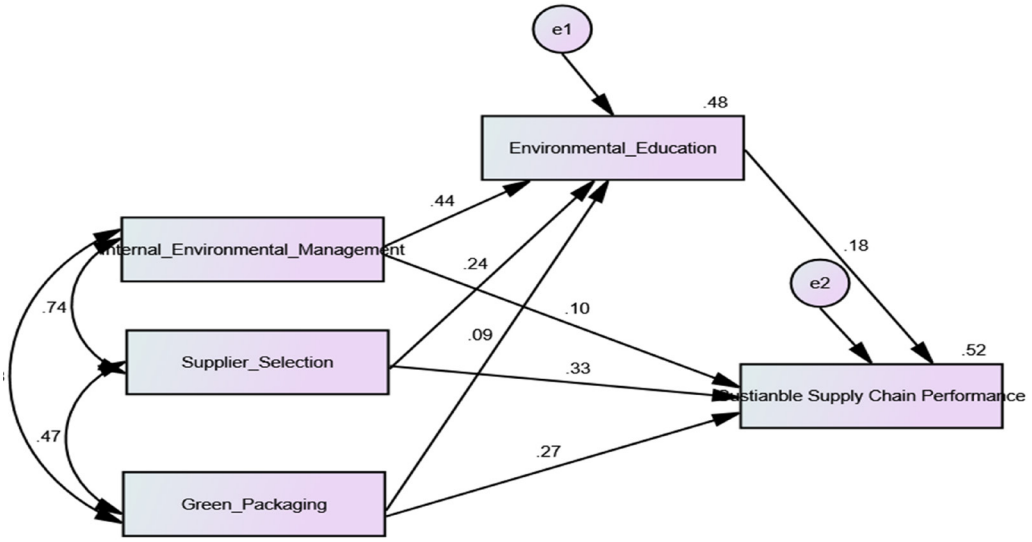
Hypothesis	Directions of Paths (SEM)	Path beta value	P-value	Remarks
H3a	GP->SSCP	.288	.000	Supported
H3b	GP->SSCP	.271	.000	Supported
H3c	GP->EE->SSCP	.016	.047	Supported

In this present the partical mediation effect of environmental education is confirmed for both internal enviormental management and green packing on sustianble supply chain performance with indirect effects of beta values 0.80 and 0.16 with p-values 0.001 and 0.047 respectively. The findings of this study are alighed with past studies. A recent study conducted by Sezen & Cankaya (2018), also confimrd positive and significant impact of internal environment management and green packaging for sustainable supply chain performance. Similarity, study carried out in China by Khan & Yu (2019), also revealed positive and significant significant impact of internal environment management and green packaging for sustianble supply chain performance. Lastly, results showed that there is positive and significant impact of internal environment management and green

packaging on sustainability performance in Jordan (Park et al., 2022; Al-Ghwayeen & Abdallah, 2018).

Furthermore, partical mediation effect of environmental education is confirmed for supply selection on sustianble supply chain performance with indirect effects of beta values 0.44 with p-values 0.001. A recent study conducted in India by Ghosh et al. (2021; 2022) also confirmed the role enviromental education for supply selection and sustianblilty supply chain performance. Another study conducted in Turkey on the manufacturing sector found that supplier selection and sustianble pefromance positvly related to each other (Asiaei et al., 2022; Yildiz et al., 2019). Laslty, the study carried in China by Quan et al., (2018) also confirmed the same findings.

Figure 2. Structural Equation Modelling



CONCLUSION

The purpose of this study to examine the mediating role of envirmental education for indpedent variables including internal environmental education, supplier selection and green packaing on sustainable supply chain performance in chemical companie of Pakistan. Findings revealed that the partial mediation effect of environmental education of all independent variables including internal environmental management, supplier selection, and green packaging on sustainable supply chain performance. However, supplier selection is found to be more significant compared to other independent variables such as internal environmental management and green packaging. Therefore, based on these findings it can be concluded that the enviormntal education is an important for achieving sustianble supply chain performance within chemical companies of Pakistan.

Present study will help the both main stakeholders such as academia and chemical companies which are operating in developing country like Pakistan that the enviormental situation can be improved through adopting identified enviormental education variable's role in designing the business strategies for acheiveing sustianble supply chain performance.

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In addition, variables such as internal environment management, supplier selection, and green packaging will bring a positive outcome in terms of positive environmental impact in developing countries like Pakistan.

Many contributions are in the present study that cannot be ignored. However, there are always limitations and future research directions for future researchers. First, the present study did not cover the maximum number of manufacturing companies. Hence, the result can not be generalized for whole manufacturing sector. Second, due to time and resource constraints, the sample size was limited to 250 only. Third, a serial mediation effect can be checked in the future by designing the complex model by adding more variables such as age and experience of the employee, etc.

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The Gravity Model of Indonesian Tourism Trade and Investment

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Abstract

This study aimed to determine the performance of tourism investment and trade in Indonesia following the outbreak of COVID-19 and other economic and non-economic factors. Goods and services for Indonesian tourism from 8 sample countries over 26 years were examined using a tourism economy approach and a gravity panel model of the flow of investment and trade. Regarding research originality, the model developed is constructing tourism economic theory applying the Keynesian method. The results showed that economic factors, such as GDP per capita, interest rates, exchange rates, prices, and economic distance, and non-economic factors, such as population, travel alerts, and pandemics, significantly affect investment flows and the tourism trade. Furthermore, tourism competitiveness increased globally in 2019. However, potential economic leakage in FDI and trade were identified. As a result, the government must emphasize long-term and efficient investment and trade in the tourism sector, particularly in the context of systemic shocks such as a pandemic.

Keywords:
trade; investment; tourism economy; competitiveness; gravity

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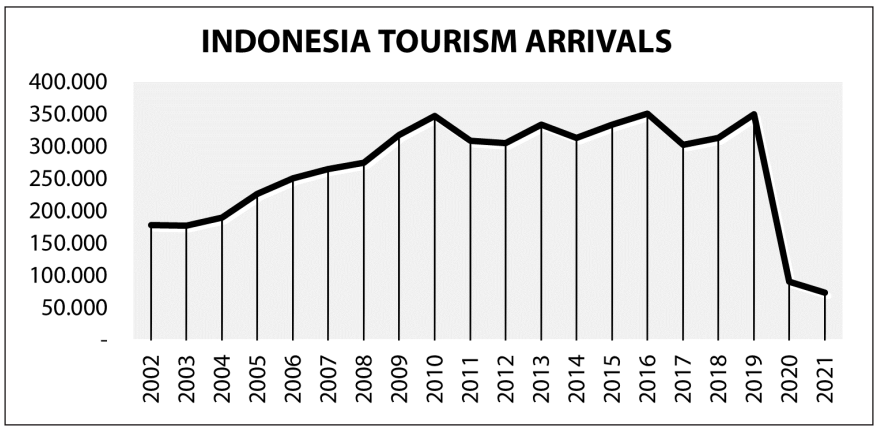
INTRODUCTION

Tourism is vital in sustaining the country's economy since it can boost national growth. As a result, increasing tourist investment has been a significant focus of tourism development strategies. According to the Indonesian Ministry of Tourism and Creative Economy, this industry investment increased by 70 percent in 2019 (Wardhana et al., 2019). Tourism demand can generate capital (exchange rate) and goods/services, which encourage tourism-related activities (supply side) (Kim et al., 2018). Due to these activities, tourists spend money on accommodation, transportation, communication, entertainment, trade, and food. Similar to increasing tourism demand, new investments, labor, and capital emerge (Singagerda & Aeni, 2017).

According to Olivia et al. (2020), tourism foreign exchange revenues from international tourist visits increased by 3.7 percent in 2019. However, it fell by over 90 percent in 2020 due to the Covid-19 epidemic, which influenced the sector's operations. Tourism consumption is relatively high due to public consumption adjustments during the pandemic. Figure 2 illustrates the tourism industry growth during the pandemic following the number of tourist visits, specifically in 15 major tourist destinations.

The Covid-19 virus began in Wuhan, China, and has terrified the world since early 2020. Indonesia has struggled with the Covid-19 virus since early March 2020. This pandemic has caused multiple causalities and deaths globally and destroyed businesses, including Indonesian tourism (Fernandes, 2020; Ozili & Arun, 2020; Evenett et al., 2021). Figure 1 shows the tourism sector's progress throughout the pandemic. Based on the number of tourist visits inbound from 15 major tourist destinations, the industry experienced a significant fall.

Figure 1. Indonesian Tourist Arrivals



Source: authors, 2022

The economic impact of COVID-19 includes limited job opportunities and economic growth due to reduced human mobility (Uur & Akbıyık, 2020; Maliszewska et al., 2020). Market anomalies are also caused by changes in consumer behavior (Nicola et al., 2020). Companies are experiencing reduced output and spending power

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limiting economic growth (McKibbin & Fernando, 2020). Consequently, it is impossible to forecast how long the COVID-19 pandemic will impact the country's economy (Fernandes, 2020).

Around the world, firms are suffering from reductions in their manufacturing and consumption activities. Global economic activity is hampered by limited inter-country transportation (McKibbin & Fernando, 2020). Furthermore, individual and corporate panic has disrupted standard consumption patterns, resulting in market abnormality (Evenett et al., 2021). Global financial markets also reacted to the developments with global stock indices. Due to the unknown nature of the outbreak's course and duration, predicting the disease's economic impact is impossible. Even in the current prevailing situation, the economic slowdown trumped the SARS outbreak (Uur & Akbıyık, 2020).

The pandemic's unpredictable nature significantly impacted the tourist sector (Baum & Hai, 2020; Hanoatubun, 2020). The impact is revenue decline and was particularly hard hit by demand-side shocks (due to movement restrictions, border closures, and tourists' fears of the virus) and supply-side shocks (due to rules regarding accommodation, catering, and recreational facilities closure). Indonesia's tourism industry is ranked 40th in the World Economic Forum's 2019 report, with a total value of 4.03 billion. The assessment was based on investment conditions, tourist goods/services supply, comfort, and security. According to Haryana (2020), investment's role and provision of goods/services should be addressed through various policies that promote tourism competitiveness to improve tourist performance. The government is concerned about future steps to boost Indonesian tourism's performance.

Kim et al. (2018) addressed this gap in their research by examining the influence of Japan's economic strategy, Abenomics, on South Korean tourists, the country's largest inbound market. Factors associated with Abenomics, such as per capita GDP, relative pricing, and exchange rates, are significant drivers of Japanese inbound tourism. Abenomics is associated with a considerable increase in South Korean tourist arrivals. The findings underscore the critical role of government economic policies in increasing international tourism demand via their economic impact. Indirect effects may arise from behavioral changes (Nicola et al., 2020), such as when consumers refrain from spending and visitors avoid places that appear to be at risk to avoid infection.

Several studies on the pandemic and its influence on tourism demand were also conducted, including Singagerda (2014); Tang & Tan (2016); Balli & Tsui (2015); Tang & Lau (2021). Due to the pandemic, most global travels ceased, with most governments imposing entry restrictions and border closures on foreigners (Uur & Akbıyık, 2020; Gössling et al., 2020; Nicola et al., 2020). Indirect effects may arise from behavioral changes (Nicola et al., 2020).

Pandemic outbreaks affect tourism-related economic activities (Brida et al., 2016). Businesses worldwide are experiencing contractions in their production and consumption activities. Transportation between nations is becoming increasingly complex, resulting in a slowdown in global economic activity (McKibbin & Fernando, 2020). Furthermore,

consumer and business panic has altered normal purchasing, causing market abnormality. Global financial markets reacted to the adjustments, and global stock indices dropped. Amid global turmoil, the International Monetary Fund estimated that the global economy would decline by 4.4 percent, contrary to its initial growth target of 5.6 percent (Liu et al., 2020).

Baum & Hai (2020) and Wong et al. (2021) found that the unpredictability of economic conditions during the pandemic greatly influenced many industries. Consequently, the tourist sector has experienced a significant drop in revenue, impacting the economy. Using an Artificial Neural Network (ANN), Jaipuria et al. (2021) projected international tourists' arrival in India and foreign exchange profits. With and without lockdown, they analyzed the impact of COVID-19 on foreign exchange losses and earnings using four parameters. The ramifications include strategic and operational actions aimed at optimizing foreign currency profits. However, McKibbin & Fernando (2020) note that numerous research issues exist due to the need for more knowledge on this outbreak.

Based on the above, a comprehensive examination of the tourism sector's role in global trade and investment during the pandemic is demanded. Tourism is mainly recognized as having the ability to contribute to Indonesia's economic growth, which is highly dependent on trade and investment flows, as well as the accessibility of goods and services and cross-border human mobility (Singagerda & Aeni, 2017; Baum & Hai, 2020). This condition is critical for the tourist industry's long-term development, especially regarding its economic impact on the country.

This research aims to assess the flow of investment and tourist trade, the factors that influence it, and how Indonesian tourism performed before and after the COVID-19 epidemic. As a research novelty, this study adopts a macro-micro approach to analyze the flow of tourism trade and investment, a micro approach that focuses on the tourism economy, which is defined by supply-demand mechanisms in various international tourism transactions. The macro approach is concerned with the concept of growth as defined by the Keynesian spending approach, with both concepts related to the impact of a pandemic (Singagerda & Aeni, 2017; Baum & Hai, 2020; Hanoatubun, 2020; Uur & Akbıyık, 2020).

METHODS

The Gravity Panel model was used to examine the factors of investment flows, tourism trade, and their impact on the Indonesian tourism sector before and after the CoVID-19 pandemic (Singagerda, 2014; Xu et al., 2019; Baum & Hai, 2020; Hanoatubun, 2020). Six countries are represented in the data set with time series from 1995 to 2020 (ASEAN, Japan, United States, United Kingdom, China, European Union, Australia, and the Rest of The World). This study is using 156 data. Additionally, national income operational variables (GDP), per capita income, Indonesian interest and exchange rates, economic distance (the ratio of GDP to the total population of the country), exports/imports, FDI, the number of tourist visits, the country's tourist population, the

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economic crisis of travel warning policies, and the COVID-19 pandemic. The framework depicts the link between variables shown in Figure 2.

The Gravity model approach is also used in this study to examine the demand side of tourism (the concept of the tourism economy) using the Keynesian model (Durbarry, 2004; Singagerda, 2014), where:

$$Y = C + I + G + (X - M)$$

According to the Durbarry (2004) and Baltagi (2021) models, the parameters of the FDI model and the flow of Indonesian Tourism Goods/Services that are constructed are as follows:

Model 1: International Tourism Investment Flow in Indonesia

$$\mathrm{Ln(FDI)_{ijt}} = \beta_0 + \beta_1 \mathrm{LnGDPC_{ijt}} + \beta_2 \mathrm{R_{it}} + \beta_3 \mathrm{LnPOP_{ijt}} + \beta_4 \mathrm{LnPRICE_{ijt}} + \beta_5 \mathrm{Ln\ TA_{ijt}} + \beta_6 \mathrm{Ln\ EXCH_{ijt}} - \beta_7 \mathrm{Ln\ DIST_{ijt}} + \beta_8 D1_{ijt} + \beta_9 D2_{ijt} + \beta_{10} D3_{ijt} + \varepsilon_{ijt} \quad (1)$$

Model 2: Export of Indonesian tourism goods/services

$$\mathrm{L_n}(X)_{ijt} = \beta_0 + \beta_1 \mathrm{LnGDPC_{ijt}} + \beta_2 \mathrm{LnPOP_{ijt}} + \beta_3 \mathrm{LnEXCH_{ijt}} + \beta_4 \mathrm{LnPrice_{ijt}} + \beta_5 \mathrm{LnPrice_{kjt}} - \beta_6 \mathrm{LnDIST_{ijt}} + \beta_7 \mathrm{LnXi_{ijt-1}} + \beta_8 \mathrm{D1_{ijt}} + \beta_9 \mathrm{D2_{ijt}} + \beta_{10} \mathrm{D3_{ijt}} + \varepsilon_{ijt} \quad (2)$$

Model 3: Import of Indonesian tourism goods/services Model

$$\mathrm{L_n M_{ijt}} = \beta_0 + \beta_1 \mathrm{LnGDPC_{ijt}} + \beta_2 \mathrm{LnEXCH_{ijt}} + \beta_3 \mathrm{LnPrice_{ijt}} + \beta_5 \mathrm{LnM_{ijt-1}} + \beta_6 \mathrm{LnFDI_{ijt}} - \beta_7 \mathrm{LnDIST_{ijt}} + \beta_8 \mathrm{D1}_{ijt} + \beta_9 \mathrm{D2_t} + \beta_{10} \mathrm{D3_t} + \varepsilon_{ij} \quad (3)$$

Note:

$\mathrm{TA_{ijt}}$ = Demand for international tourism to Indonesia for the t year

$\mathrm{FDI_{ijt}}$ = Indonesian Tourism Investment Flow from country j year tGDPCjt

$\mathrm{R_{it}}$ = Investment interest rate in Indonesia in year t

$\mathrm{X_{ijt}}$ = Export of tourism goods/services from Indonesia to other countries

$\mathrm{PRICE_{ijt}}$ = The real price of Indonesian tourism in the country of origin of tourists

$\mathrm{PRICE_{kjt}}$ = The real price of tourism in competing countries in the country of origin of tourists

$\mathrm{X_{ijt\text{-}1}}$ = Export lag (millions of USD)

$\mathrm{POP_{ijt}}$ = Population of the country of origin of tourists

$\mathrm{M_{ijt}}$ = Import of tourism goods/services from the country of origin of foreign tourists (USD)

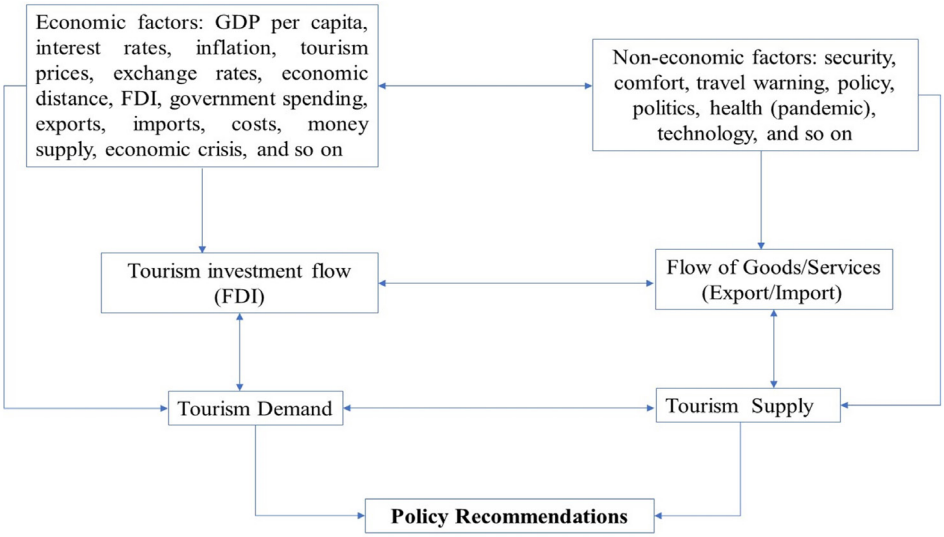
$\mathrm{DIST_{ijt}}$ = Economic distance between Indonesia and the country of origin of foreign tourists (Km/GDPijt)

$\mathrm{GDPCi_{ijt}}$ = Income per capita of the home country of foreign tourists (million USD/ population)

$\mathrm{EXCH_{ijt}}$ = The exchange rate of the rupiah against the currency of the country of origin (rupiah/currency of the country of foreign tourists)

M_{ijt-1} = Import lag (million USD)
$D1_{ijt}$ = Dummy Travel Banned in year t
$D2_{ijt}$ = Dummy Economic crisis in year t
$D3_{ijt}$ = Dummy Covid-19 in year t

Figure 2. Conceptual Framework



Sources: Durbarry (2004); Singagerda (2014); Maliszewska et al. (2020)

RESULT AND DISCUSSIONS

Model of Foreign Direct Investment in Indonesian Tourism

The results of this study show that the GDP per capita variable from the tourist's home country and its population, Indonesian tourism price, the number of foreign tourists, the exchange rate, economic distance, and the Covid-19 pandemic all have the potential to significantly affect the fluctuating flow of Indonesian tourism investment. Meanwhile the coefficient of determination describes changes in the GDP per capita of the tourists' home country, interest rates, the population of the country of origin of foreign tourists, Indonesian tourism prices, number of tourists visiting, exchange rates, economic distance, economic crisis, travel restrictions, and the Covid-19 outbreak account for 45.8 percent of the variance in the tourism investment flow variable, with the remaining 54.2 percent explained by other factors.

It indicates that the development of tourism investment in Indonesia is primarily due to non-macroeconomic factors. There are five constraints to investment in Indonesia, including complicated rules, problematic land acquisition, inconsistent public infrastructure, insufficient taxes and incentives, and limited skilled labor (Meilani, 2019). Government intends to implement an omnibus law, which would simplify licensing laws, shorten the licensing procedure, and ensure political stability in order to improve Indonesia's investment ecosystem. Interest rates are essential in determining the amount of investment that enters a country. When interest rates rise, investment declines, and therefore, individuals rush

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to invest in several business industries when interest rates fall. Similarly, the economic distance between Indonesia and the country of origin of tourists significantly affect the FDI. This implies that the greater the economic distance between both Indonesia and the country of origin of tourists (generally described by the ease of mobility/accessibility of capital, goods/services, and labor), the slower the flow of investment will increase by the coefficient of change.

Table 1. Estimation Model of FDI, Export, and Import of Indonesian Tourism

Indonesian Tourism Export				Indonesian Tourism Import			
Variable	**Coefficient**	**t-stat**	**Prob**	**Variable**	**Coefficient**	**t-stat**	**Prob**
GDPIT***	-0.633	-5.812	0.0000	GDPJT	0.030	0.143	0.8862
POPIJT***	1.207	-3.178	0.0017	EXCHIJT**	-0.188	-2.273	0.0242
EXCHIJT**	-0.150	1.270	0.0258	PRICEIJT	0.018	1.192	0.2348
PRICEIJT	0.001	0.081	0.9353	MIJT***	0.283	5.854	0.0000
PRICEKJT**	0.017	1.391	0.1659	FDIIJT	-0.017	-0.725	0.4695
DISTIJT***	-0.598	-3.846	0.0002	DISTIJT	-0.144	-0.616	0.5385
XIJT***	0.132	4.488	0.0000	D1	0.069	1.059	0.2910
D1	-0.046	-0.991	0.3228	D2***	-0.173	-2.981	0.0032
D2	0.064	1.543	0.1246	D3***	-0.353	4.098	0.0001
D3***	-0.247	-3.855	0.0002				
R-Squared		0.970		R-Squared		0.923	
Adj_R_squared		0.967		Adj_R_squared		0.916	
F-stat		358.887		F-stat		141.711	

Indonesian Tourism Investment			
Variable	**Coefficient**	**t-stat**	**Prob**
GDPJT	0.237	0.642	0.5219
RIT***	-0.657	-4.253	0.0000
POPIJT	0.434	0.428	0.6689
PRICEIJT	-0.059	-1.427	0.1552
TAIJT***	-1.314	8.949	0.0000
EXCHIJT	-0.544	-1.538	0.1257
DISTIJT**	0.832	1.814	0.0712
D1**	0.387	2.353	0.0197
D2	-0.222	-1.546	0.1238
D3***	1.117	5.855	0.0000
R-Squared		0.458	
Adj_R_squared		0.410	
F-stat		9.453	

Sources: Singagerda (2014); Baltagi (2021)
Note: *Two side test hypothesis* Ho: θ = θo, Hi: θ > θo atau Hi: θ < θo

This study shows that the number of tourists visiting Indonesia may be detrimental to FDI in tourism. In the wake of the liberalization process, the mobilization of goods/services, capital, and labor has resulted in economic leakage. In consequence, this has reduced tourism investment and increased visitor arrivals (Singagerda & Aeni, 2017; Ozili & Arun, 2020). These shortcomings are caused by foreign investment supremacy, which leads to thousands of imported hotel equipment, food ingredients, furniture, workers, and foreign airlines.

The economic crisis had a significant negative impact on FDI in the Indonesian tourism sector (see Table 1). For several years, the increase in FDI in Indonesian tourism was triggered by an increase in its competitiveness, particularly when compared to tourism prices in neighbouring countries such as Malaysia and Singapore (Singagerda, 2014;. Furthermore, the Indonesian Investment Coordinating Board (BKPM) has identified COVID-19 as a serious threat to a country's economic stability. The reduction in investment value would be obvious due to trade interactions between countries like China, Europe, and the United States (Evenett et al., 2021). Restrictions or lockdowns have a substantial influence on trade activity. The rule applies to commodity exports and imports from China, the United States, and Europe, providing potential bottlenecks in the supply of industrial raw materials (Baum & Hai, 2020).

Model of Indonesian Tourism Export Goods/Services

The negative relationship between Indonesia's GDP per capita and tourism exports indicates that in case the Indonesia's GDP per capita increases by 1 percent, tourism exports will decrease and vice versa, which contradicts trade theory (Hatab et al., 2010; Maliszewska et al., 2020). Therefore, there is a negative correlation between these two aspects. A rise in purchasing power will increase the public demand because the GDP per capita is an indicator of community welfare due to economic growth (Maliszewska et al., 2020). The output of products/services remained unchanged, pushing up commodities prices (demand-pull inflation). Empirically, foreign tourists' home countries significantly affect Indonesia's tourism exports. Therefore, the population of the home country of the international tourists (as potential market) would increase. A potential market for goods and services depends on the country's population size (Balli & Tsui, 2015).

The actual exchange rate negatively influences tourism exports. When the domestic currency depreciates versus foreign currencies, imported products become more expensive than home products, promoting more exports of goods and services. According to Hoekman & Mattoo, (2008); Gjorgievski, (2011); and Kim et al., (2018), when a country's currency strengthens against foreign currencies, the current account balance is negatively affected. However, exports increase since domestic goods are considerably cheaper than imported ones. The real price of Indonesian tourism in competing countries has a negligible effect on Indonesian tourism exports. Therefore, Indonesian tourists will continue to be a substitute for international tourism with its price as a substitution especially in Asean countries (Singagerda & Aeni, 2017; Wong et al., 2021). Furthermore, the estimation results reveal a weak relationship between the economic crises and export flows. This implies that an economic crisis forces people's purchasing power down due to a country's falling economic performance.

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A large positive link existed between the previous and the coming years tourism exports and value. In case the previous grows, the following one also surges. The trade performance between the two years correlates due to economic growth (Lorde et al., 2011; Balli & Tsui, 2015), such as the emergence of Export Led Growth (ELG) and Growth Led Export (GLE). Moreover, neoclassical trade theory supports this premise because variables other than exports can enhance output. Another possibility is that export performance will be negatively impacted between 2018-and 2019 due to the trade war between China and the United States (Olivia et al., 2020)

Indonesian Tourism Goods/Services Import Model

The estimation results indicate that the coefficient of determination for the variable is determined by the economic distance between the tourist's home country, GDP per capita, real exchange rate, the real price of Indonesian tourism in the country of origin, imports from the country of origin in the previous year, FDI, the economic crisis, Indonesia's travel warning, and the COVID-19 pandemic on the variable outflow of goods/services for Indonesian tourism. These aspects may explain 92.3 percent of Indonesia's tourism import variables, while the remaining 7.7 percent is explained by non-observable factors.

The impact of export performance in the 2018-2019 period will be negative due to the trade war between China and the imports (Noland et al., 2012; Wardhana et al., 2019). Although the home currency depreciates, foreign currencies imports continue to rise (Kim et al., 2018). Despite the rupiah's depreciation, the low competitiveness of domestic tourism goods/services drove up imports. Even the previous year's imports had a significant positive influence on the following year's imports. Furthermore, the trade performance was a determining factor for the development of imports in Indonesia. This is because of the high reliance on imports of goods and services, especially goods that will be used in the production process (Dogru & Bulut, 2018; Guridno & Guridno, 2020).

A travel warning policy by the tourists' home country will inevitably damage Indonesia's tourism imports. The country/security destination is related to the travel warning policy normally adopted by visitors' home countries. The 2019 WEF assessment rates Indonesia's security and safety at 5.4 (Lorde et al., 2011; Evenett et al. 2021). This shows Indonesia's competitiveness in security, health, and safety (Sugihamretha, 2020).

According to research, the global COVID-19 pandemic affected Indonesia's tourism imports. Since several countries are implementing lockdowns, international economic activity has been disrupted (Baum & Hai, 2020). According to BPS data, the Covid-19 pandemic affected petroleum & energy imports and non-oil imports over the 2020 period. The decline happened when multiple countries confirmed they had Covid-19, halting international trade. These minimized the risk of a Covid-19 pandemic (Guridno & Guridno, 2020). The Covid-19 pandemic has prompted all countries to limit human activity and mobility, affecting productivity and delivery of goods/services. Following the global economic slowdown, people's purchasing power has shrunk, reducing demand for imported goods. In order for tourism to exist during the pandemic, health and hygiene policies in hotels and tourist destinations/attractions must be

strictly implemented. Similarly, during the current pandemic, development priorities in the three support sub-sectors, including culinary, fashion, and crafts, should be completed.

CONCLUSION

The travel warnings and the COVID-19 pandemic are all variables that affect the flow of Indonesian tourism FDI. This study examined numerous variables, including the GDP per capita of the tourist's home country, exchange rate, and population as a potential tourism market, the price of tourism, the interest rate, and the economic distance, the dummy of the economic crisis. The most significant determinants were the FDI interest rate in Indonesian tourism, leading to foreign tourist visits, economic distance, the economic crisis, and the COVID-19 pandemic. The results showed the possibility of economic leakage in FDI flow in Indonesian tourism, leading to foreign exchange leakage. The mobilization of goods/services, capital, and labor due to liberalization in the use of foreign capital, the construction of facilities on international networks, and the supply chain in the construction of five-star hotels necessitate importing hotel supplies.

Some macro variables, economic crisis, travel advisories, and the covid-19 outbreak, influence Indonesia's tourism exports and imports. Even since the beginning of 2020, the Covid-19 pandemic created an economic contraction in tourist visits and foreign exchange revenues in the tourism industry, including trade and investment transactions. The estimation of the export-import equation of Indonesian tourism products/services based on the calculation of expenditure income (Keynesian approach) showed that there was a chance for Indonesian tourism products to substitute related commodities from other countries, including Thailand, Singapore, and Malaysia, especially in price. Although Indonesia's tourism competitiveness increased globally in 2019, the competitiveness of tourism goods and services still needs to improve. Furthermore, the economic leakage in tourism FDI flows results in foreign exchange leakage due to the mobilization of goods/services, capital, and labor. Due to liberalization in the use of foreign capital and the construction of facilities on international networks, the supply chain in the construction of five-star hotels induces imports of hotel supplies, food ingredients, furniture, workers, and foreign airlines, particularly with the COVID-19 pandemic causing an economic contraction.

Government can increase the competitiveness of industrial products in the global market by improving the quality of domestic industrial products based on market needs. Tracing the advantages of similar products in the market, creating digital technology innovations and mass applying them on a priority scale for high-value products, and establishing regional regulations can help accomplish national and regional efficiency. Therefore, the government should eliminate foreign exchange leakage in the tourism industry by implementing policy strategies, followed by export, supplier, stability in the investment climate, and economic input levels. In addition, related to the pandemic period, the implementation of health and hygiene policies in hotels and tourist destinations/attractions should be followed strictly. Besides that, the policies are designed to promote the good image of Indonesian tourism by developing effective communication strategies with diverse stakeholders at home and abroad. Similarly, development priorities in the three support sub-sectors, including culinary, fashion, and crafts, should be completed soon since they were more resistant during the pandemic.

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What is the trend after Covid-19? A Political-Economic Analysis of the Pension Systems in Hong Kong and MACAU

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Abstract

The aging trend of the population in Hong Kong and Macau is evident, so the pension system is especially significant. This research paper uses document analysis and a double-case study as the research method. It uses path dependence and critical moments in historical institutionalism theory as the theoretical tools for political economy analysis. The discussion argues that "the social culture shaped by local politics," "the combination of local economic development and economic structure," and "influence from social structure" are the three main factors that influence the pension systems in Hong Kong and Macau, and are the fundamental reasons for the differences between the pension systems in Hong Kong and Macau. We also conclude that the outbreak of COVID-19 is causing the evolution of the pension systems in both regions to be converging.

Keywords:
the pension system; historical institutionalism; COVID-19; document analysis; double-case study

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INTRODUCTION

The world is facing rapid aging of the population, and pressures are mounting on welfare states to support increasing numbers of elderly people (Flynn & Schröder, 2021). Governments have adopted the policy logic of creating a social welfare support system for the elderly to reduce the negative impacts of rapid aging. The social welfare support system for the elderly usually consists of two major systems: the pension system and the senior care system.

Hong Kong and Macau share very similar histories, social cultures, and political realities, but they were influenced by different colonial political, economic, and social factors, which are the advance and basis for comparative studies. According to the general view of institutionalist scholars, the pension system, as an institution embedded in the local socio-economic system, is a continuous and progressive dynamic process that is also characterized diachronically Therefore, the process of the pension system construction is inevitably influenced and constrained by the socio-economic institutional environment. It is suitable to examine the pension systems in Hong Kong and Macau by means of historical comparative research. Although many scholars have reviewed the pension system in Hong Kong and Macao from the perspectives of the industry and social ideology, in the analysis of this paper, we will use the perspective of "market-government-association" relationship to discuss the pension system in Hong Kong and Macau, which is relatively innovative.

For a long time, scholars have discussed pensions in Hong Kong and Macau as part of the social security system, and scholars have tended to discuss the pension system more at the macro or micro level, with few studies thinking at the mid-level (Chan, 2011; Fong et al., 2011; Holliday, 2000; Jacobs, 2000; Sheng, 2011). Although Chen & Guo (2011) compared and analyzed the pension systems of Hong Kong and Macau in terms of fairness, efficiency, adequacy, robustness, and sustainability, and they did not review the development of the pension systems of Hong Kong and Macau from a dynamic perspective and did not identify the factors affecting the development of the pension systems of Hong Kong and Macau. However, this study also brings some ideas to this study. By reviewing the established literature, we can find that a number of scholars (Chow & Chou, 2005; Hon, 2012) have already assessed the retirement protection system by using a three-pillar or five-pillar framework, but the overall study could not reach a dynamic and time-dependent discussion. Of course, there are scholars who have studied the impact of adult children on social security for the elderly in South Korea and Hong Kong societies in a comparative research path (Lee et al., 2018), as well as the differences between Hong Kong and Australia in terms of retirement systems (Strano & Christopher, 2016). Their studies do not take this system as an object of study, so cannot provide some discussion and predictions about the evolution of this system.

Among them, more scholars prefer a static approach and do not take into account the evolution of the pension system. However, Flynn & Schröder (2021)

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compared the operation of the pension systems in Hong Kong and the UK from an institutional perspective. In this study, we expect to introduce a temporal dimension (both historical and predictable) in our discussion of the pension systems in Hong Kong and Macau.

This paper explores the following questions. First, what are the main factors influencing and constraining the construction of pension systems in Hong Kong and Macau? Second, what are the path dependencies of Hong Kong and Macau? Third, after being affected by critical events, what is the impact on the development paths of the pension systems in Hong Kong and Macau? Through the discussion of the above-mentioned issue, we can focus more clearly on the general evolutionary trend of the pension system as a social welfare system in Hong Kong and Macau with the influence of COVID-19, which is also the purpose of this paper.

METHODS

As one of the two major approaches of social science research, qualitative research is based on constructivism, critical theory, and its purpose is to explore, describe and explain. It is discovery and process-oriented research with the function of exploring social phenomena, interpreting meanings and digging into the deep structure of society, it is an iterative research process (Aspers & Corte, 2019). Qualitative researchers usually conduct research by interview method, and they often interview relevant people in depth to obtain valuable information.

In order to focus on the questions of research, this research paper adopts a qualitative approach. And, this paper is also an Exploratory Study (Patton, 2002), and after the conclusion of this study, there is still a room for further discussion. Case studies in qualitative research have the advantage of being more internally calibrated and therefore more suitable for exploring cause-and-effect relationships. In addition, this study will include a time dimension for discussion, so that a large amount of formal and informal documentation will be discussed in order to enrich the case study as much as possible.

RESULT AND DISCUSSIONS

Exploring the Pension System in Hong Kong and Macau from the Institutional Dimension: Historical Institutionalism, Critical Juncture, and Trend Forecast

Historical Institutionalism. There are numerous schools of thought in new institutionalism, scholars in the field widely accept the division into historical institutionalism, rational-choice institutionalism, and sociological institutionalism (Hall & Taylor, 1996). Historical institutionalists emphasize long-term trends and utilize concepts such as “institutional change”, “path dependence”, and “critical juncture” and “feedback” (Pierson, 2000; Shih et al., 2012; Thelen, 2005). This thought allows them to better explore some of the mechanisms of political change. Prior institutions existed at the time of the emergence of any given institution. Any institution forms structural

relationships and undergoes structural changes in interaction with a number of factors, including the macro-institutional context, such as the basic institutions of politics, economy, and culture. With the deepening of research on institutional change theory, historical institutionalism has developed a variety of models of institutional change, such as evolutionary change, endogenous change, progressive change, and diversity change (Cartwright, 2021).

Mahoney & Thelen (2009) had summarized the theory of progressive institutional change. They argue that there are four models of progressive institutional change: displacement, layering, drift, and conversion. Of particular interest to this paper, "Layering" refers to the gradual growth of a new institution that replaces the status and function of the original institution, thus changing it. In short, it is the introduction of a new institution overlaid or coexisting with an existing one. Historical institutionalism emphasizes path dependencies that change over time (Bannerman & Haggart, 2014). In order to get out of this lock-in, it is necessary to seek a strong enough external force.

Critical Juncture. The research aim of this study is to examine the formation, evolution, and development trends of pension systems in Hong Kong and Macau at the institutional level with a time dimension. In particular, the development trend of the pension system relies on the understanding of critical junctures.

A critical juncture is a point in time during the process of institutional change when a particular policy decision is made. Once this particular choice is made, it is very difficult to return to the original path of change (Shih et al., 2012). The "critical juncture" arises as a consequence of the interaction of social, economic, political, or extra-territorial factors. From the policy-making perspective, a critical juncture is similar to Kingdom's policy window in the policy output process.

Historical institutionalism is an important theory for explaining the institutional change, which introduces historical analysis in the framework of institutional research and focuses on the integrated role of time series and environmental elements in institutional change. From this macroscopic perspective, the process of institutional change can be divided into "normal periods", when the system survives, and "critical junctures", when the system breaks down. As defined by (Collier & Collier, 2015), a critical juncture is such a period of significant change in which major choices are made that will determine the path of the next stage of historical development. How can we determine whether a certain event may become a critical juncture of the institution in the historical process?

This article supports the conclusions of (Hogan, 2006), research on critical juncture. As shown in Figure 1, only if both the conditions of "Generative Cleavage" and "Significant, Swift, Encompassing Change" are met, does the event satisfy critical juncture. Otherwise, it is only an incremental change. Additionally, this study takes the squeeze on an institution as one of the dimensions to measure the critical juncture. We believe that institutions in society are necessarily changed by political, economic, or other factors that shape them.

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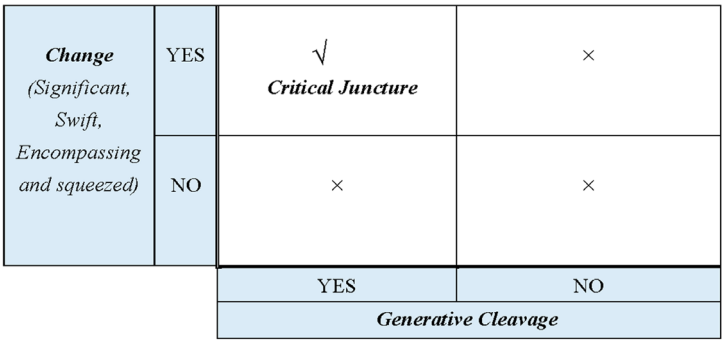
Figure 1. The Critical Juncture Grid



Source: Hogan(2006)

Forecast of the Evolution of the Institutional Trend

The "critical junctures" are of significance for institutional change, where important decisions are made during major events that will directly determine the direction and path of institutional development in the next phase (Collier & Collier, 2015). The forecast mentioned here is limited to the forecast of system development trends and the institutional development trends, which are at the macro level. As mentioned earlier, there are many factors that affect the evolution of institutions, and in many cases, they are contingent and cannot be predicted precisely. However, from the perspective of long-term institutional development trends, it is possible to make predictions.

The Evolution of the Pension System in Hong Kong and Macau: Constraints and Adaptations in the Social Environment

The pension system in the modern sense originated in Germany in the late 1880s. With the development of society, the pension system continues to inject an element of equity and gradually becomes an important part of the social security system of each country or region. Hong Kong's social welfare system in the modern sense began in 1966, while Macau's social welfare system did not take shape until after the 1980s.

Progressive Change (Layering) and Path Dependence in Hong Kong's Pension System

After World War II, Britain established a comprehensive social security system from "cradle to grave" and built the first "welfare state", which became the model of Western welfare states (Briggs, 1961; Korpi & Palme, 1998). However, for a long time, Hong Kong, similarly to other British colonies, was never a "Welfarism" colony. After rapid economic development in the 1960s, Hong Kong faced two critical social problems at the same time: an aging society and a growing divide between the rich and the poor. It is also clear that the social welfare system has an important structural supporting role in retaining political stability and preventing political conflicts. Therefore, the British–Hong Kong government realized the need to establish a social security system, in order to reduce the existing but not yet visible social problems, and thus solidify the governance

of Hong Kong. In other words, the very essence of colonial politics dictated that the Hong Kong–British government would only try to maintain social governance at the lowest possible cost, and protect and sustain the profit and privileges of the British merchants (Midgley & Piachaud, 2011), rather than prioritizing the livelihood of the people in its administration. In summary, the Hong Kong–British government adopted a market-oriented and socialized policy to gradually build up the social security system in Hong Kong, and the pension system is included in it.

According to the previous explanation and definition of critical junctures, there are two time-junctions in the evolution of Hong Kong's pension system that is characterized as critical junctures. In 1971, the Hong Kong authorities took over from the private sector the cash assistance scheme for the citizens of Hong Kong, which later evolved into the Comprehensive Social Security Assistance scheme at the core of Hong Kong's pension system. The year 1997 was important for Hong Kong and the people of Hong Kong, with the outbreak of the Asian financial crisis and the reunification of Hong Kong to the P. R. China and the practice of "One country, Two systems". Thus, the development and evolution of Hong Kong's pension system are discussed in three stages.

Emergence (Before 1971). From the opening of Hong Kong to the mid-1960s, social security in Hong Kong was dominated by two forms of private self-help and mutual aid. Of these, only a few agencies or international organizations provided minor financial assistance for the poor. It was not until the 1960s that the Hong Kong–British government began to reevaluate its role in providing social welfare, and in 1965, the White Paper on Aims and Policy for Social Welfare in Hong Kong was published. This was the first social welfare policy White Paper, which also marked the real beginning of social security in Hong Kong. However, social security related to the elderly was not mentioned in the White Paper. The authorities focused only on widowed elders, providing them with a small amount of in-kind assistance on the grounds that "according to traditional Chinese values, support for the elderly is a personal and family responsibility". The following year, G. Williams, as a social security consultant to the Hong Kong–British government, published a report on the feasibility of a survey into social welfare provision and allied topics in Hong Kong. The report recommended that the government must develop a social security program to address short-term crises such as illness and death, as well as long-term problems of old age. This is the first time in the history of the development of old age security in Hong Kong that targeted social security needs for the elderly were raised. In 1967, the authorities set up an inter-departmental working group to study the social security system in Hong Kong and at the same time published a report by the Inter-Departmental Working Party to consider certain aspects of social security. In the report, it was recommended that the authorities should adopt a progressive approach to social security policy, starting with the social assistance aspects of sickness, medical care, infirmity, and survival. Unfortunately, the government did not accept the recommendation. Some scholars believe that this stage of Hong Kong is the residual model of the social welfare system (Tang, 2011).

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Enrichment and Institutionalization (1971–1997). Since the 1970s, the Hong Kong–the British government has been under pressure to directly cope with the welfare of the elderly in Hong Kong society. It is becoming common for an increasing number of residents and workers to petition the government directly without going through NGOs or advisory committees (Sawada, 2004). Meanwhile, social security for the elderly gradually became a more prominent social issue as more laborers were released from their families to participate in the market, leading to the weakening of the traditional family care function. More importantly, influenced by the political turmoil in Hong Kong in 1966–1967, there was a shock to the legitimacy of the colonial government, and the authorities had to initiate extensive political and social changes. In 1971, the Hong Kong authorities launched cash-based public assistance, a means-tested public assistance program to provide cash assistance to the elderly, people with no income or low income, and families, thus taking over the responsibility of cash assistance from voluntary agencies and non-profit organizations. This program has since evolved into the Comprehensive Social Security Assistance scheme, which is the source of the institutionalization of pensions in Hong Kong. In the following years, the Hong Kong authorities introduced the Disability Allowance and the Old Age Allowance, which in effect enriched the pension system in Hong Kong. The 1968–1977 period is known as the era of expansion of social policy in Hong Kong. They hoped to remedy the crisis of legitimacy caused by the turmoil of increased public welfare spending as much as possible.

The Hong Kong issue has long been in the structure of Sino-British relations. When official China–United Kingdom signed the Sino-British Joint Declaration in 1984, the Hong Kong authorities were very clear that "Hong Kong is no longer a steak on the table of Great Britain" and would return to China on July 1, 1997. However, the British in Europe and Hong Kong were not in favor of the succession of Hong Kong to P. R. China, so they continuously created artificial obstacles against reunification. Therefore, on the one hand, they are continuously injecting democratic elements into the structure of Hong Kong's political culture (Chun, 2019). On the other hand, they are also continuing to hollow out the Hong Kong government's finances. In addition to increasing spending with massive infrastructure program, massive social welfare expenditures are another method. There is the why the Hong Kong authorities changed their negative attitude and actively promoted a series of old-age welfare policies in the early 1990s, after having proposed several old-age retirement schemes to no avail in the 1980s. Of course, the aim of this was also to make a good impression on the residents of Hong Kong.

Systematization (After 1997*).* Thus, the British enacted a large number of policies in various aspects of social welfare before Hong Kong's return to China, which enriched the Hong Kong pension system and indeed objectively contributed to the progress of social welfare in Hong Kong. The new government of the Hong Kong S.A.R. has to face two major social problems: Hong Kong's aging population continues to grow (Lee, 2005) and the gap between the rich and the poor is increasing. The social problems

have a direct impact on the Hong Kong S.A.R. governments' construction of the social welfare systems, including the pension system. Hong Kong has long benefited from the positive effects of high economic growth, i.e., full employment and growth in real income. Therefore, Hong Kong residents' need for social welfare is minimized (Lee, 2005). Hong Kong took advantage of the period of reform and opening up in mainland China to relocate a large number of industrial production processes to southern China, where labor costs are lower, gradually shaping the "Front store and Back factory" pattern. This has directly led to a tremendous development of Hong Kong's service industry. However, non-local industrialization has led to a loss of low-skilled jobs, a widening wage gap, and increased structural poverty, which has also led to lower economic growth rates (Cingano, 2014; Siu & Wong, 2004). Hong Kong citizens are also dissatisfied with many aspects of the fields of housing, environment, health care, and education, and the public's concern and demand for social welfare have increased, The new S.A.R. government not only faces serious internal social problems but also needs to overcome external risks, such as the 1997 Asian financial crisis and the SARS epidemic. Therefore, the S.A.R. government must gain the support of the people by optimizing and systematizing its social welfare policies in order to strengthen its legitimacy in governance.

Additionally, external impetus stems from the World Bank's recommendations and improvements to the pension system. Under the influence of the population-aging crisis that gradually emerged in the 1980s, the pension system, which was based on the pay-as-you-go model at that time, faced the dilemma of unsustainable financial balance and difficulty in securing the basic livelihood of the elderly. In this context, the World Bank proposed the "three-pillar" plan pension reform model. Since then, after controversial theories of reflection, the World Bank has proposed the five-pillar plan, which has become an important guide for countries or regions around the world in constructing pension systems.

After the 1997 Asian financial crisis, the Hong Kong economy gradually recovered with the support of Beijing. The S.A.R. government also increased its investment in social welfare for the elderly. Although the MPF system has been controversial in Hong Kong society (Au-Yeung & Chan, 2020), the Hong Kong S.A.R. government has gradually developed a multi-pillar pension system with the Comprehensive Social Security Assistance Scheme and the Mandatory Provident Fund Scheme as the core. The current pension system in Hong Kong is incomplete in terms of the five-pillar framework. The protection provided by pillar zero is far from adequate and lacks the support of pillar one, which is far below Western standards (Jacobs, 2000)

Progressive Change (Layering) and Path Dependence in Macau's Pension System

The origin of Macau's old-age social welfare system can be traced back to the relief services provided to poor citizens by the Public Charity Society. The Portuguese–Macau government in 1938, founds this fact. It was not until the 1980s when the Portuguese–Macau government created the "Social Security Fund" (act no. 84/89/M),

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that Macau's social security system was officially established. After reunification, the Macau S.A.R. government gradually established a "two-tier" social security system and actively used the World Bank's five-pillar plan as a reference to continuously improve the Macau social security system, which led to a continuous increase in the happiness index of Macau residents. In 1989, the Macau authorities passed a decree to implement a social security system. This marked the institutionalization of the pension system with the establishment of the social security system and was one of the critical junctures in the evolution and development of the pension system in Macau. The Macau pension system has thus become an essential part of the Macau social security system. Another critical juncture was the liberalization of Macau's gaming industry. Based on this, this study discusses the development of Macau's pension system in the following three stages.

Social Relief Oriented (Before 1989). The local community in Macau has a long history of benevolence. As early as 1569, D. Belchior Carneiro Leitão SJ, the first bishop of the Catholic Diocese of Macau, founded the first charitable organization in Macau, the Church of Mercy. Established in 1892, the Macau Tung Sin Tong Charitable Society provides free material and medical assistance to those in need, including care for the elderly. In the early period, the provision of social welfare in Macau relied mainly on civil society groups, mostly in the form of mutual support among the Chinese community, which assumed the social assistance functions of the Macau government. At that time, the relief of associations mostly provided social relief in the form of assistance or relief goods, which objectively enhanced Macau's social security capacity.

In 1938, the Portuguese–Macau government established the Public Relief Society, which began to intervene in Macau's private charitable services; this meant the beginning of the colonial government's formal involvement in the relief of the poor and later reorganized the Public Relief Society into the Public Relief Branch in 1960, and incorporated it into the government structure. At that time, Macau was plunged into an immediate economic depression and social problems due to the influx and then the mass evacuation of refugees. In the face of this, the Portuguese–Macau governments have had to pay more attention to social welfare issues, including the welfare of the elderly. In 1967, the Portuguese–Macau government established the Social Relief Division (legislative decree no.1755), based on the Public Relief Branch, to provide financial assistance to citizens.

Regularization (1989–2002). From the mid-1960s onwards, the Macau economy entered a period of high growth. This is the main reason that the Portuguese–Macau governments have also increased their investment and management in the field of social security. The Portuguese–Macau governments have successively introduced a series of laws concerning the social welfare system in Macau, which has led to the gradual regularization of the social welfare sector in Macau.

In order to enhance the protection of employees in Macau, the Portuguese–Macau Government officially implemented the "Macau Social Security System" in 1989, which institutionalized social security in Macau. Among other factors, its scope of application, benefit items, and their payment standards, forms of contribution, and responsibilities

were clearly defined. Meanwhile, a growing number of governments consider pension institutions as beneficial to serve the aging of the local population (Kasri, et al., 2020). Accordingly, the Macau Social Security Fund (Decree-Law No. 84/89/M) came into operation, and this also signaled the formation of Macau's social security system. Under the social insurance system, both employers and employees contribute to the system, and the government budget allocates funds to the system as a source of income to provide financial assistance to contributors, including the elderly, unemployed, or sick local workers. Furthermore, during this period, the Portuguese–Macau government benefited from the rapid growth of the economy, adjusted the "pension system" for government employees, and introduced the "civil service pension system". Since 1993, voluntary contributions, self-employed labor contributions, and new benefit programs have been added one after another. During this period, Macau's associations also played an important role. For example, the 20th Congress of the Macau Federation of Trade Unions passed a resolution urging the Macau government to enact a law to protect the welfare of workers, which directly led to the enactment of the first Labor Law of Macau.

Constructing and Completing (After 2002). Due to gaming liberalization after the handover, the Macau S.A.R. government has benefited from large revenues from the gaming industry, which has provided the cornerstone for the continuous improvement of the Macau S.A.R.'s social security system (Ngan, 2002). Law No. 6/99/M on Private Pension Funds was promulgated on February 8, 1999, and was officially implemented in 2003.In 2005, the S.A.R. government began to provide subsidies for senior citizens, which is a reflection of the adequacy of the pension system rather than a form of social assistance. In 2007, the Provident Fund Scheme for Workers in the Public Services (Law No. 8/2006) came into effect. At the same time, the former Civil Service Pension System, in principle, was no longer open to new registrations. In the same year, in order to share the benefits of economic development and combat inflation, the S.A.R. government proposed a universal cash-sharing scheme. In 2011, the Social Security Fund was transferred to the Secretary for Social Affairs and Culture, while Law No, 4/2010, the Social Security System, came into force, revolutionizing the contribution system by introducing a mandatory and discretionary contribution system, extending coverage to the entire population and implementing the first tier of the social security system. Since then, the Macau S.A.R. government has gradually adjusted and improved the amount and operation of the system through legislation and the approval of the Chief Executive.

In addition to continuously improving the first tier of the social security system, this has also improved the adequacy and stability of the Macau pension system. In order to enhance the social security of Macau residents and to complement the existing social security system, after more than ten years of repeated debates, Law No.7/2017(Non-Mandatory Central Provident Fund System) and by-Law No.33/2017 (Supplementary Provisions on Non-Mandatory Central Provident Fund System), the second tier of the two-tier social security system, came into effect on January 1, 2018. Furthermore, there are various additional aids and subsidy schemes that citizens can apply for.

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Table 1. The Current Pension Systems in Hong Kong and Macau

	Hong Kong's Pension System	Macau's Pension System
Pillar 4: Support with family and other non-participating members	Personal savings and Family support	
Pillar 3: Voluntary savings	Private Pension Scheme, Civil Service Pension Scheme (Voluntary Contribution Part)	Non-Mandatory Central Provident Fund System, Private Pension Scheme,
Pillar 2: Mandatory occupational or personal retirement protection plans	Mandatory Provident Fund System, Occupational Retirement Schemes, Civil Service Pension Scheme (Mandatory Contribution Part)	Government Retirement Scheme, Provident Fund Scheme
Pillar 1: Features mandatory, public management, pay-as-you-go, and defined benefit		Central Savings System, Social Security System (Law No. 4/2010)
Zero Pillar: Income Protection for the Elderly	Comprehensive Social Security Assistance Scheme, Portable Comprehensive Social Security Assistance Scheme, Social Security Allowance Scheme (Old Age Allowance, Normal Old Age Living Allowance, Higher Old Age Living Allowance, Guangdong Scheme and Fujian Scheme)	Wealth Partaking Scheme, Financial Assistance, Subsidy for Senior Citizens

Source: Compiled from relevant official documents of the Hong Kong and Macau S.A.R.

After the above three stages of development, the pension system in Macau was also gradually constructed and perfected. The Macau pension system, from its absence to its construction, followed by the perfection of the system, is clearly characterized by a path-dependent, layering pattern of gradual institutional change. Macau has developed a relatively robust pension system for local residents.

The Variables Affecting the Development of Pension Systems in Hong Kong and Macau Based on a Historical Institutionalism Perspective

Social Culture shaped by Local Politics: *"Individualism and Liberalism"* & *"Mutual Support"*

The institution in historical institutionalism theory consists of informal and formal institutions. Local social culture, as an externalized form of informal institution, has the characteristics of being stable and unchangeable in the long term and deeply rooted in society. The local social culture is closely related to the local political and economic development, and political development has a guiding effect on the social culture. Therefore, we believe that social culture is the most essential factor in the development and evolution of pension systems in Hong Kong and Macau, and it is also an important reason for the differences between the two pension systems. Hong Kong and Macau were under the long-term colonial rule of Britain and Portugal, and although they were neighboring each

other, both Confucianism and Lingnan culture influenced the social security systems of Hong Kong (Holroyd, 2003) and Macau and formed different social cultures.

For more than a century, the United Kingdom has embedded the ideas of liberalism and individualism in local society, and the Hong Kong–the British government has long emphasized the crucial role of the market and the individual in the development of Hong Kong society. It is undeniable that liberalism and individualism are some of the major reasons why Hong Kong has become a critical city for international finance, trade, and shipping (Midgley, 1998; Nip, 2010). For a long time, the positive non-intervention principle of the Hong Kong–the British government has become the golden rule of the government in managing social and economic affairs and has even developed into a moral discourse defining the merits of the government's public finance and economic policies, as proposed by the government and the business sector. The social security system is embedded in the political and economic institutions, so it is hard not to be influenced by such social culture. As a result, a social welfare ideology dominated by liberal and individualistic values has gradually emerged, and a residual welfare model has been gradually developed through progressive institutional changes (Wu & Chou, 2017).

However, after the reunification, in order to reflect the superiority of "one country, two systems" to strengthen the legitimacy of the S.A.R. government and to reduce the negative impact of the growing wealth gap in Hong Kong society, the S.A.R. government has gradually adjusted its value orientation in the area of social welfare and made improvements to the social security system, including the Comprehensive Social Security Assistance Scheme, and employee and housing benefits (Ngan, 2002). However, due to the long-term shaping of the local social culture and the path dependence of the original pension system, it is difficult to reduce or eliminate the value impact evoked by liberalism and individualism in a short period of time. The Mandatory Provident Fund System and the Comprehensive Social Security Assistance Scheme are the most important components of the current pension system in Hong Kong, both of which have a strong emphasis on market and individual social culture. In recent years, under the influence of local populism and the demand for the development of the Universal Retirement Scheme, Hong Kong's social welfare model is not heading towards welfare state welfarism, but towards an increasingly perfect residual model of Hong-Kong-style welfarism.

In the same way that Britain rooted liberalism and individualism in Hong Kong, the Portuguese colonization of Macau influenced the local society and culture of Macau. At the beginning of Portuguese domination, the Chinese community was powerless, and the Portuguese sustained an Iberian superiority complex, resulting in the phenomenon of "Portuguese superiority and Chinese low social status" in Macau's local society. At that time, the majority of the governing class in Macau was of Portuguese descent, and in order to save the cost of governance, the Portuguese did not directly run the affairs of the Chinese community. In addition, the natural differences in language, customs, and religion led to the formation of a special social pattern of "Chinese and foreigners living together and ruling separately". As a result, there is little integration between the two communities in Macau, even though they interact and have contact with each other.

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Therefore, for a long time, the Chinese community has practiced internal mutual aid to compensate for the lack of a social security system implemented by the government, and, over time, a mutual support association culture has developed in local society.

The social culture of mutual support has had two major impacts on the construction and evolution of the social security system in Macau: First, it has contributed to the growth of the strength of the Chinese community in Macau, which has forced the Portuguese and Macau governments to address the social demands raised by the Chinese community. To this day, these associations still have an enormous influence on the political development of Macau. In Macau's social security system, associations still perform a large number of social security service functions. Second, Macau's social security system is gradually moving towards a more supportive and caring system. From the current pension system in Macau, it is clear that the five-pillar scheme is relatively complete and has a clear "government takes overall social security functions" character. After reunification, Macau's social security system has moved towards a hybrid model that blends the East Asian welfare policy model with universal welfare. The Macau S.A.R. government has intensively pursued social security policies, supported by the tax revenues from the dominant industry of gambling. Macau's "welfare leaping" has demonstrated the superiority of the "one country, two systems" regime, but has also raised concerns about the sustainability of Macau's social welfare system.

By the combination of local economic development and economic structure: *"Economic diversification"* & *"Boom by a sole industry"*

Hong Kong society has long practiced individualism and liberalism, pursuing market-oriented economic efficiency as much as possible, and Hong Kong citizens generally accept that the market path can solve most of the problems brought about by social development, while the government should only assume the role of regulating and promoting market development. This "Big market, Small government" economic development pattern has constrained the gradual change in Hong Kong's pension system. From the perspective of SMEs, they do not want the government to expand social security spending and impose a potential tax burden on them, and they are benefited by the people in Hong Kong society becoming less motivated to work and relying on excessive social welfare, which will affect their pursuit of maximum efficiency. In addition, the financial services industry, as a backbone of Hong Kong's economy, is the most important economic lifeline of Hong Kong. The long-term development of the financial services industry, on the one hand, has resulted in a large number of financial products related to retirement in the Hong Kong financial market, for example, insurance products, reverse mortgage plans, silver bonds, Hong Kong dollar fixed-term and blue-chip stocks; on the other hand, it also improves Hong Kong residents' financial knowledge and financial management ability, and even the S.A.R. government has a public sector investor and financial education committee to enhance Hong Kong citizens' financial management knowledge and ability. However, the financial services industry has always been affected by the external environment, which will have an impact on the robustness of Hong Kong's pension system.

The development of productivity and production relations determines the basic

appearance of the emergence and development of social security, while the financial strength of the government determines the level and coverage of the social welfare system. Before the reunification, Macau faced social problems such as deteriorating law and order, poor business environments, high unemployment rate, and stagnant economic development, which seriously affected the stable development of Macau society and investors' confidence. Macau was also hit hard by the SARS epidemic soon after its reunification, and it was only after Beijing started to implement the Individual Visit Scheme and gaming liberalization that Macau's economy gradually recovered. With the growth of fiscal surplus, the S.A.R. government's spending on social security also increased, allowing Macau to improve its pension system. According to the official year-round statistics of Macau, gaming-related taxes account for 80% of government revenue and provide the livelihood of more than three-quarters of Macau's population. Although the S.A.R. government is aware of the need for moderate economic diversification, it is difficult to change the situation that the gaming industry is in, i.e., "boom by a sole industry". Therefore, the continuous improvement of the social security system and social welfare level in Macau is based on the rapid development of the gaming industry. However, the gaming industry is highly influenced by external factors, such as the SARS epidemic in 2003, the anti-corruption in the mainland in 2015 (Li & Sheng, 2018) and the COVID-19 epidemic in 2021, which have all caused a significant decline in gaming tax revenue. The two characteristics of Macau's economy, the single industrial structure and the volatility of the gaming industry mean that Macau's finances do not have a solid foundation, which also indicates that the development of Macau's social security system and the development of the gaming industry are highly correlated. In other words, when the gaming industry, which is the backbone of the economy, fluctuates, it will affect the sustainability and adequacy of the established social security system.

Influence from social structure: *"Big market, Small government, and Weak association"* & *"Strong association, Small government, and Weak market"*

Hong Kong society highly recognizes individualism and liberalism, and the people of Hong Kong generally accept the principle of "maximizing the function of the market", which they believe is powerful and can solve most of the problems brought about by social development. Therefore, the government should interfere as little as possible with the operation of the market itself. Due to the development of a liberal market economy that has made Hong Kong an immigrant society, and the influence of the British colonial rule on the Chinese factor, even though there are many associations in Hong Kong, commercial interest groups are still the main force influencing policymaking. In other words, even if the public proposed their demands through community channels, the force of policy support is not very strong. In this way, Hong Kong society has developed a social structure of "big market, small government, and weak associations". Hong Kong has developed along the path of high marketization and has formed a path dependency, and policymaking, legislation, and government administration are all deeply influenced by this. The current pension system in Hong Kong is also shaped by

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this background, with the characteristics of "emphasizing market functions, highlighting individual choices, and weakening the role of the government". It is true that, through the market route, individual creativity can be greatly stimulated, and some of the cost of governance is shared. However, the uncertainty of the market always causes instability, which is contrary to the robustness of pensions. In addition, over-emphasis on market functions will have negative effects on social structure and social governance: first, it will weaken the government's functions and limit the space for other social governance actors to speak, which will mean that social development will continue to be restricted by the market; second, over-reliance on the market will increase the gap between the rich and the poor and solidify social classes, which will cause long-term social worries; third, emphasizing the role of market factors in the social structure is basically emphasizing the maximization of private interests, which contradicts the value of universal public policies.

Macau is different from Hong Kong in that Macau society has developed a social structure of "strong associations, small government and weak market" in its historical development. In Macau under Portuguese colonization, the Portuguese have long practiced the strategy of "separation of the Chinese and the foreigners", which led to a long period of separation between the Portuguese and Chinese communities. Therefore, the Portuguese–Macau governments' long-term "rule by doing nothing" towards the Chinese community has normalized the Chinese community working together to solve problems in their daily lives, and through the social atmosphere of mutual support, Macau has become a community society. As the strength of the associations grew, the government had to incorporate them into the policy network; their ability to participate in politics was strengthened, and the influence of the community on policy formation or formulation was gradually reinforced. After reunification, the importance of associations in the social governance structure of the S.A.R. government increased rather than decreased, and the government responded positively to the social-security-related demands of associations. Especially in the area of social security, the relationship between the S.A.R. government and the associations is a collaborative partnership (Ho & Lam, 2014). The government will work together with social service organizations to respond to the needs of Macau society through various welfare policies and service measures. The market and individual factors are not obvious in the Macau pension system, which is the biggest difference compared to the Hong Kong pension system. It was not until the emergence of private pensions and retirement schemes that a certain amount of market factors was incorporated to address the issue of income replacement rates. It is the "government-led, association-led, market-led" pension system that is the distinctive feature of Macau's pension system. However, the government's long-term underwriting of Macau's social welfare system may lead to the welfare dependency of Macau citizens.

Political-Economic Analysis Based on Critical Juncture: How Does the COVID-19 Global Epidemic Affect the Pension System in Hong Kong and Macau?

The continued spread of the COVID-19 global epidemic has had a very profound political, economic, and social impact on all regions of the world. It could even trigger

a realignment of the world order due to the success of some countries in preventing the epidemic(Ceylan et al., 2020; Chen, 2020). The outbreak and spread of the epidemic have also had an impact on the social welfare systems constructed by national or regional governments (Béland et al., 2021; Lu et al., 2020; Mok et al., 2021). Despite the increased recognition of Macau's epidemic control, Macau, similarly to Hong Kong, has been affected and impacted by the COVID-19 epidemic at the economic, political, and institutional levels. From the perspective of the pension system, will the outbreak and continuation of the COVID-19 epidemic become a critical juncture in the development and evolution of the pension system in Hong Kong and Macau?

In accordance with (Hogan, 2006), the COVID-19 global epidemic is defined as a critical juncture. The global spread of COVID-19 is no longer only a gradual process, as issues ranging from restrictions on individuals' freedom to travel, the mandatory wearing of masks, vaccine research, and development, vaccine distribution, etc., have created social conflicts throughout the duration of the epidemic. For example, social conflicts have broken out in the United States, Mexico, France, and other countries to protest some of the strong preventive and control measures. Globally, such social conflicts are on the rise. On the other hand, as a critical juncture, the characterized the COVID-19 global epidemic includes significant, swift, encompassing, and generative changes. According to the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU) statistics, in less than two years, more than 200 million people worldwide have contracted the virus, with more than 4 million deaths due to COVID-19 infections, and no country or region is immune to the enormous impact of the global epidemic. In particular, a massive infectious epidemic is bound to have a significant and long-lasting impact on the local medical, health, and social security systems.

First, from the perspective of the economic environment and government spending, the COVID-19 global epidemic has increased the spending of the government in order to prevent and fight the epidemic (Irawan & Alamsyah, 2021). At the same time, the COVID-19 global epidemic has reduced government revenue due to the inevitable global economic recession. As a result, concerns about the adequacy and sustainability of the local pension system have been raised. Most obviously, because of the wave of unemployment brought about by COVID-19, the number of people claiming government unemployment benefits has increased, which will make government spending will increase (Li & Zeng, 2015). Hong Kong and Macau, as small and microeconomics, are very vulnerable to the impact of the external environment; in particular, Macau's lack of economic resilience due to its single economic structure is very obvious (Sheng & Gu, 2018). Second, the global economic downturn will inevitably have an impact on the part of the pension system that relies on the market mechanism. In particular, the Mandatory Provident Fund System of the Hong Kong pension system, which is overly dependent on the market, has greatly reduced its ability to preserve the value of individual accounts in times of a global recessionary crisis. Third, the COVID-19 global epidemic has increased pension system expenses and caused older workers to permanently withdraw from the labor market and retire, resulting in an increase in the number of beneficiaries of the pension system, as well as the early withdrawal of some pensions to relieve personal financial stress.

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The epidemic crisis has exposed the defects of the pension system in Hong Kong and Macau. The Hong Kong pension system relies too heavily on the regulation of the market and is vulnerable to the influence of the external economic environment, which will cause individuals to bear too much market risk and a lack of stability, while for the Macau pension system, the already dense pension system relies on financial support from the government, coupled with the single structure of government revenue. It is highly possible that the adequacy and sustainability of the pension system will be affected.

CONCLUSION

From the perspective of system evolution, the COVID-19 global epidemic, as a critical juncture in the evolution of the pension system in Hong Kong and Macau, will have a profound impact on the evolution of this institution. Meanwhile, the Anti-Extradition Law Amendment Movement, and this social movement increased the divisions in Hong Kong society and caused changes in the local political culture. In addition, the Hong Kong S.A.R. government will review its past social policies and make adjustments, as well as strengthen the social security system in universal welfare. It is on the basis of the epidemic and social movements that the Hong Kong S.A.R. government will inevitably adjust and improve its pension system, in addition to other forms of disaster relief.

Therefore, Hong Kong will enrich the first and second pillars and appropriately reduce the market-dependent pension path, and as market volatility due to the epidemic continues, the Macau government will delay increasing the adjustment of the market-dependent pension system for the protection of public interest.

After the previous political economy analysis, we can conclude. The factors that influence the evolution of pension systems in Hong Kong and Macau are the differences in social values, the differences in economic structures, and the differences in the "market-government-association" relationship, which are also the main reasons for the path dependence of pension systems in Hong Kong and Macau. When COVID-19 is the critical juncture, the governments of Hong Kong and Macau will moderately increase the basic pension expenditure and reduce the market-based means of preserving value. This makes the pension systems of the two regions show the same trend as above. It is not until a new critical juncture appears that the evolutionary trend of the various systems is affected.

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Determinants and Impacts of Trust on *Awqf* Institutions: Intergenerational Evidence from Indonesia

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Abstract

This study evaluates the determinants and impacts of trust toward awqf institutions. We extend previous studies by examining the determining role of religiosity and knowledge on trust towards awqf institutions, in addition to the role of reputation and integrity. Our study differs from the previous studies as we incorporate the intergenerational analysis of 658 experienced and inexperienced Indonesian waqf donors by employing the PLS-SEM method. Our findings suggest that religiosity and knowledge significantly influence trust toward awqf institutions. However, the impact differs across generations X, Y, and Z. While the direct impacts of religiosity and knowledge on the intention to do cash waqf are insignificant for certain generations, the variables significantly impact the intention of all generations when moderated by the trust. Therefore, our primary implication is for awqf institutions to know their customers better and offer more trust-enhancing programs for the inexperienced younger generations.

Keywords:

intention to donate; waqf; trust; intergeneration analysis; PLS-SEM

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INTRODUCTION

History evidences the important role undertaken by *Waqf* (Islamic endowment) in the socio-economic development process of the Muslim world (Medias et al., 2021). *Waqf* has long served as a primary vehicle for the private sector to provide public goods and thus enhance the decentralized development in the Muslim land (Çizakça, 1995). The very concept of *waqf* has also been adapted in advancing the development of Muslim minority territories such as England in the form of the Merton College Oxford in 1274 (Gaudiosi, 1987). This is despite critiques on the rigidity of its form from scholars like Kuran (2001).

The current (modern) development of cash *waqf* has, to some extent, addressed the limitations of the *waqf* system posed by Kuran (2001). The flexibility offered by cash *waqf* allows this vehicle to be used for virtually all modern development initiatives (Çizakça, 1998). Countries like Indonesia have gone the extra mile by combining the cash *waqf* and sukuk (Islamic bonds) in a blended financing scheme termed "Cash *Waqf* Linked Sukuk" (CWLS). The Indonesian government has also launched the National Movement of Cash *Waqf* (GNWU, which stands for *Gerakan Nasional Wakaf Uang*) to escalate the awareness of citizens towards the importance of cash *waqf* in public development.

However, those significant endeavors of the government have yet to realize the cash *waqf* potential. The collection of cash *waqf* between 2011 and 2018 accounts that around 0.14% of its potential figure. A year after the GNWU movement was launched in early 2020 by the President, the cash *waqf* collection remains only circa 0.5% of its potential. One of the most mentioned reasons behind this phenomenon is the lack of trust in the *awqf* (the plural form of *waqf*) institutions (Shukor et al., 2018). One anecdotal evidence suggests that many are skeptical of the GNWU, saying the initiative is only a way for the government to get more money to fulfill its budget deficit caused by the coronavirus crisis. While this rumor has, of course, no valid evidence, the lack of trust in *awqf* institutions is a problem acknowledged by Indonesian *Waqf* Body (BWI) in its 2021's working paper (Sukmana et al., 2021).

The above discussion raises an intriguing question of how trust in *awqf* institutions influences donors' intention to perform cash *waqf*? However, before answering this, another important query needs to be addressed. That is, what determines trust in the *awqf* institutions in the first place? Most importantly, is there any cross-generational difference in the relationships? This research seeks to address the above questions.

While the determinants of trust and its influence on intention are widely researched in the literature (see, to name a few, Burnett, 1992; Saxton, 1995; Sargeant & Lee, 2004; Shukor et al., 2018), performing the study on cash *waqf* in the spatial context of Indonesia remains scant. The previous studies also fall short in examining the determinants of trust beyond reputation and integrity variables (Shukor et al., 2018), such as religiosity and knowledge (Aziz & Chok, 2013; Hamdan et al., 2013; Vanany et al., 2019). Furthermore, most previous literature also fails to account for intergenerational analysis. This is where our study tries to contribute, hence our novelty.

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Trust is defined as the belief that a counterparty, be it institutions, organizations, or people, will never exploit stakeholder vulnerabilities arising from agency issues (Sargeant & Lee, 2004). Barney & Hansen (1994) believed that customer's trust bestows a competitive advantage. This element is also essential for charitable organizations, including *awqf* institutions, since it can encourage donor willingness to provide funding support. If the public does not fully believe in charity, they will be relatively less willing to donate (Sargeant & Lee, 2004). Commonly, people do not participate in organizations they do not trust or feel confident about (Melendéz, 2001). In the case of *awqf* institutions, the value of trust is even greater because the lack of maintaining donor's *waqif*'s trust could lead to negative consequences such as a decrease in donations, reputation damage, and even a collapse of the organization (Burnett, 1992; Sargeant & Lee, 2004; Saxton, 1995; Shukor et al., 2018). Hence, *awqf* institution is expected to be trustworthy and selflessly working for society's interest and the common good.

Previous studies such as Haidlir et al. (2021) and Kasri & Chaerunnisa (2022) modify the infamous Theory of Planned Behavior (TPB) to capture the effect of trust on cash *waqf* intention. Both studies document the positive impact of trust on intention. However, the latter only observes the indirect effect of trust through attitude. Haidlir et al. (2021) show the direct impact of trust on intention but fall short in explaining the determinants of trust. A few determinants of trust are examined by Shukor et al. (2018), they illustrate the impact of integrity and intention on trust and, in turn, intention to endow cash *waqf*.

Our study differs from the previous studies in at least four aspects. First, we put trust as the primary focus of our model, unlike Haidlir et al. (2021) and Kasri & Chaerunnisa (2022), yet in harmony with Shukor et al. (2018). As mentioned earlier, trust is one of the key factors to influence the optimality of cash *waqf* collection. Putting these factors at the epicenter of analysis allows *awqf* institutions to seek appropriate strategies to optimize their operations and markets. Moreover, this variable is also directly related to the *awqf* institution, and the intervention is fully handled by them.

Second, we extend Shukor et al. (2018) by adding religiosity and knowledge as the determinants of trust consistent with the previous literature (for religiosity, see Johari et al., 2015; Osman et al., 2016; Baqutayan & Mahdzir, 2017; for knowledge see Johari et al., 2015; Shukor et al., 2017). These two variables are important in the case of cash *waqf*. Religiosity is a sign of commitment to follow religion's principles. It is thus fundamental in determining *waqf* participation as *waqf* is not only social action but, also a part of worship (Delener, 1990; McDaniel & Burnett, 1990). Knowledge represents individual's understanding of the cash *waqf*, which is found as an important factor of action related to the implementation of Islamic economics (Aziz & Chok, 2013; Hamdan et al., 2013; Vanany et al., 2019).

Third, we perform the intergenerational analysis by evaluating not only all samples but also the multigroup of Generations X, Y, and Z. Each generation may have unique characteristics that influence their cash *waqf* behavior (Lambert 1972; Kovic & Hansli 2018). Approaching those three generations with a one-size-for-all strategy may not be

the best way to optimize their participation in cash *waqf*, as supported by the following studies.

Kovic & Hansli (2018) document intergenerational differences, even though the difference is not big. This is in line with Koczanski & Rosen (2019), who illustrate the greater Millennials' donation than earlier generations. Hasan et al. (2019) and Wadi & Nurzaman (2020) show variations in donating behavior across generations within the context of *waqf*. Wadi & Nurzaman (2020) also indicate distinct generosity between Gen Z and Gen Y. Gen Z is known for its bigger concern on ethical issues (Francis & Hoefel, 2018).

The different characteristics and personalities mentioned above could lead to variations in the determinant of trust and its role in cash *waqf* donation. This may lead to finding a more appropriate *waqf* collection strategy that accommodates the three generations' distinct characteristics. Furthermore, the intergenerational issue is also contextual to Indonesian demography dominated by the young generation (Gen Z and Y). Mapping the dynamic strategy based on this view will be useful for *awqf* institutions to derive a relevant and effective strategy to attract public participation. Finally, we examine the different behavior of those who have experienced (experienced) donating cash *waqf* and those who have not (inexperienced) to strengthen the analysis and sharpen the segmentation strategy. This approach is useful for investigating the level of public trust between those who have interacted with *awqf* institutions and those who have not.

The remaining of this study is arranged as follows. In the next section, we discuss our methodology on how we approach our research questions. This will be followed by results and discussion. The last section concludes our study.

METHODS

Description of Data

The object of this study is Indonesian Muslims with various backgrounds. This study follows a non-probability purposive sampling technique employed by many consumer-behavior studies (Hulland et al., 2018; Sarstedt et al., 2018; Saunders et al., 2009). To maintain the heterogeneity of the sample, a periodical evaluation was set to control the sample composition representing Indonesia's demographic condition. The data was gathered through an online survey questionnaire. To ensure the validity of items and reliability of variables, the wording, and piloting test were passed in advance.

This study eventually managed to collect 658 valid respondents across Indonesian provinces covering the three-generation group, Gen X, Y, and Z (ages between 18-55 years old). Our sample also covers those who have experienced donating through *awqf* institutions and those who have not.

Model

Figure 1 illustrates the model used in this study as an extension of the theoretical framework discussed in the previous studies, particularly by Shukor et al. (2018), Haidlir et al. (2021), and Kasri & Chaerunnisa (2022). The model sets trust as the

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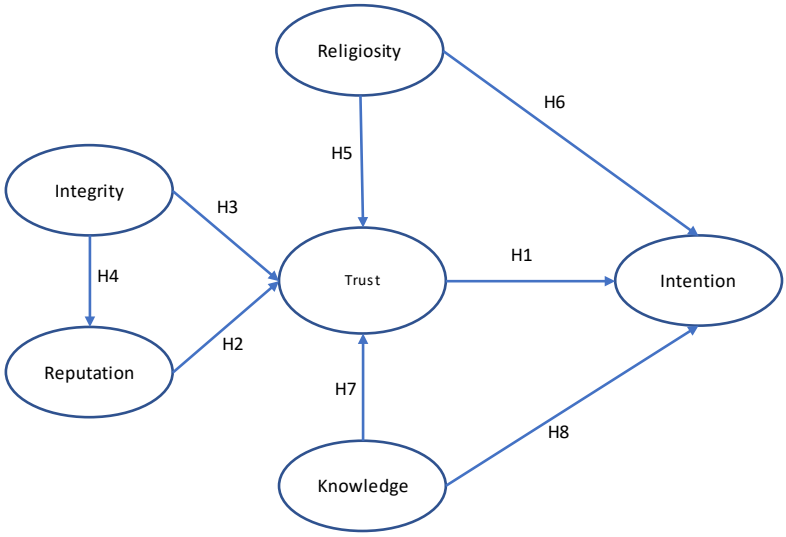
central determinant of the intention to donate cash *waqf*. Besides two widely researched determinants of trust, namely integrity and reputation, this model also accommodates two other important factors, namely knowledge and religiosity, as direct and indirect determinants of intention.

Figure 1. Model's Framework



In order to deepen the analysis, this study takes into account the different characteristics of generations (including Gen-Z, Gen-Y, and Gen X) and the effect of experience as the *waqif* (experience and inexperience Group). The operationalization of the model is provided in Table 1.

Estimation Method

We apply the Partial Least Square Structural Equation Modeling (PLS-SEM) to address our research questions mentioned in the introduction. The statistical analysis was carried out through Smart PLS 3.2.9 with bootstrapping as a statistical hypothesis testing procedure. The unit analysis of this study was at the individual level. To check whether the particular characteristic of behavior varied among the generations and experience in *waqf* participation, Multi-Group Analysis (MGA) was applied. Based on Hair et al. (2010) and Alzadjal et al. (2022), the PLS-SEM is considered the most rigorous and robust data analysis technique for causality relationships.

There are two main processes undergone before comparing and analyzing the path coefficient between subgroups (Multi-Group Analysis or MGA), namely model assessment and structural model evaluation. Model assessment consists of a measurement model and invariance measurement to make sure the model construct is applicable. We then evaluate the structural model by checking the coefficient determination and model fit criteria to assess the power of the model in predicting the hypothesis.

To analyze MGA, we compare the path coefficients of causal relationships for the

entire sample and each subgroup along with their significance. To strengthen the analysis, we compare the specific indirect effect of the model. Besides that, we also employ the independent t-test for the two-tailed hypothesis to check the difference in trust levels between subgroups. The value of trust is compared to statistically approve the difference between subgroups. The test is classified into two, namely within generation test and within experience one.

Table 1.Variable and items of the questionnaire

Variable	Code	Indicator	Source
Knowledge	*K1*	*I am familiar with the concept and programs of waqf*	Shukor et al. (2018)
	K2	*I think I know a lot about waqf*	
	K3	*I have enough knowledge about waqf institutions and Indonesia Waqf Bodies (BWI)*	
Intention	*I1*	*I have the desire to participate in the cash waqf program shortly*	Osman & Muhammad (2017); Hasbullah (2015); Abdul Kareem et al. (2019); Shukor et al. (2018)
	I2	*There is the possibility that I will participate in the cash waqf program soon*	
	I3	*I will choose the cash waqf program as an alternative to donate*	
	I4	*I will recommend the cash waqf program for my friends and people around me*	
	I5	*My desire to participate in the cash waqf program is getting stronger day by day*	
Religiosity	*R1*	*Religion is very important for me*	PEW Research
	R2	*I always try to follow the orders and avoid restrictions of my religion*	
	R3	*I always participate in every religious service*	
	R4	*A strong sense of God's presence in my every activity is very important for me*	
Trust	*T1*	*I believe that waqf institutions have tried their best on helping people to do waqf*	Shukor et al. (2018)
	T2	*I think I have trust in waqf institutions*	
	T3	*I think the managing process conducted by waqf institutions can be trusted.*	
Integrity	*Int1*	*In my opinion, the work program created by waqf institutions can be fulfilled*	Shukor et al., (2018)
	Int2	*In my opinion, waqf constitutions have shown consistency between what they say and what they do*	
	Int3	*In my opinion, waqf institutions have a high value of honesty*	
Reputation	*Rep1*	*In my opinion, the process of collecting and managing cash waqf has a positive reputation*	Shukor et al., (2018)
	Rep2	In my opinion, the collection and management of cash waqf have been transparent both in terms of finance and policy	
	Rep3	In my opinion, the collection and management of cash waqf have been considered well by the community	

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Model Assessment

Before evaluating the structural model in the MGA, two model assessments are employed. First, the measurement model is examined to assess the accuracy of the construct measured and the model's explanatory power. Here, factor loadings, composite reliability (CR), average variance extracted (AVE), Cronbach alpha, and discriminant validity are performed (Chin, 1998; Fornell & Larcker, 1981; Hair et al., 2017). A concurrent validity construct requires all measurements to have standards loading factor above 0.5, CR above the cut value of 0.7, AVE exceeding the cut value of 0.5, and Cronbach Alpha's (CA) value is no less than 0.7. Table 2 shows that all requirements in model measurement are fulfilled in our model. This suggests that all constructs in this research framework are valid, reliable, and empirically different.

Table 2. Measurement Model

Item	Entire Sample (N=658)					X (N=237)				
	FL	CA	rho-A	CR	AVE	FL	CA	rho-A	CR	AVE
Intention		0.905	0.910	0.940	0.839		0.902	0.902	0.938	0.836
I1	0.923					0.923				
I2	0.927					0.929				
I3										
I4										
I5	0.898					0.890				
Trust		0.944	0.944	0.964	0.899		0.941	0.941	0.962	0.895
T1	0.934					0.933				
T2	0.955					0.951				
T3	0.955					0.953				
Reputation		0.879	0.883	0.925	0.805		0.842	0.849	0.904	0.759
Rep1	0.911					0.889				
Rep2	0.890					0.868				
Rep3	0.891					0.857				
Integrity		0.866	0.867	0.937	0.882		0.853	0.853	0.931	0.872
Int1										
Int2	0.938					0.935				
Int3	0.940					0.932				
Religiousity		0.833	0.837	0.889	0.668		0.765	0.812	0.843	0.575
R1	0.824					0.687				
R2	0.864					0.806				
R3	0.739					0.785				
R4	0.837					0.749				
Knowledge		0.866	0.866	0.937	0.882		0.828	0.830	0.921	0.853
K1	0.938					0.920				
K2	0.940					0.928				
K3										

Item	Y (N=329)					Z (N=92)				
	FL	CA	rho-A	CR	AVE	FL	CA	rho-A	CR	AVE
Intention		0.906	0.930	0.940	0.840		0.893	0.896	0.934	0.825
I1	0.922					0.919				
I2	0.922					0.927				
I3										
I4										
I5	0.905					0.878				
Trust		0.947	0.948	0.966	0.903		0.938	0.939	0.960	0.890
T1	0.934					0.930				
T2	0.959					0.948				
T3	0.958					0.951				
Reputation		0.899	0.902	0.937	0.832		0.871	0.877	0.921	0.795
Rep1	0.919					0.931				
Rep2	0.909					0.856				
Rep3	0.909					0.887				
Integrity		0.866	0.867	0.937	0.882		0.885	0.885	0.946	0.897
Int1										
Int2	0.937					0.946				
Int3	0.942					0.948				
Religiosity		0.866	0.865	0.910	0.717		0.794	0.872	0.864	0.615
R1	0.881					0.772				
R2	0.870					0.875				
R3	0.736					0.652				
R4	0.891					0.821				
Knowledge		0.894	0.898	0.949	0.904		0.841	0.915	0.924	0.859
K1	0.947									
K2	0.955									
K3										

Item	Exp. (N=378)					Inexp. (N=200)				
	FL	CA	rho-A	CR	AVE	FL	CA	rho-A	CR	AVE
Intention		0.889	0.900	0.923	0.749		0.907	0.911	0.935	0.783
I1										
I2	0.836					0.870				
I3	0.865					0.899				
I4	0.861					0.858				
I5	0.900					0.910				
Trust		0.939	0.939	0.961	0.892		0.945	0.947	0.964	0.900
T1	0.925					0.940				
T2	0.953					0.953				
T3	0.954					0.954				
Reputation		0.807	0.816	0.912	0.838		0.862	0.867	0.935	0.878
Rep1	0.926					0.943				
Rep2	0.904					0.931				
Rep3										

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Item	Exp. (N=378)					Inexp. (N=200)				
	FL	CA	rho-A	CR	AVE	FL	CA	rho-A	CR	AVE
Integrity		0.860	0.871	0.914	0.781		0.905	0.908	0.941	0.841
Int1	0.846					0.893				
Int2	0.920					0.941				
Int3	0.884					0.917				
Religiosity		0.823	0.824	0.883	0.655		0.820	0.825	0.880	0.647
R1	0.829					0.793				
R2	0.858					0.832				
R3	0.730					0.752				
R4	0.814					0.838				
Knowledge		0.825	0.845	0.895	0.741		0.869	0.875	0.920	0.793
K1	0.828					0.881				
K2	0.775					0.920				
K3	0.619					0.870				

Note: Based on the result of the invariance measurement items I3, I4, Int1, and K3 are omitted from the analysis for generations. I1, and Rep3 are excluded for analysis of Experience in *awqf* participation

Table 3. Fornell-Larcker criterion

Subgroups	Variables	Int	I	K	R	Rep	Trust
Between Generation Groups							
Entire Sample	Integrity	0.939					
	Intention	0.466	**0.916**				
	Knowledge	0.277	0.379	0.939			
	Religiosity	0.348	0.345	0.309	**0.817**		
	Reputation	0.843	0.511	0.268	0.370	**0.897**	
	Trust	0.795	0.447	0.309	0.397	0.813	**0.948**
Gen X	Integrity	0.934					
	Intention	0.432	**0.914**				
	Knowledge	0.286	0.533	**0.924**			
	Religiosity	0.274	0.341	0.301	**0.758**		
	Reputation	0.825	0.520	0.323	0.376	**0.871**	
	Trust	0.765	0.447	0.367	0.346	0.786	**0.946**
Gen Y	Integrity	0.939					
	Intention	0.496	**0.916**				
	Knowledge	0.282	0.285	**0.951**			
	Religiosity	0.363	0.344	0.318	**0.847**		
	Reputation	0.861	0.556	0.270	0.362	**0.912**	
	Trust	0.812	0.486	0.298	0.410	0.835	**0.951**
Gen Z	Integrity	0.947					
	Intention	0.427	**0.908**				
	Knowledge	0.234	0.273	**0.927**			
	Religiosity	0.407	0.312	0.226	**0.785**		
	Reputation	0.797	0.328	0.124	0.428	**0.892**	
	Trust	0.810	0.387	0.277	0.555	0.802	**0.943**

Subgroups	Variables	Int	I	K	R	Rep	Trust
Between Experience Group							
Exp	Integrity	0.884					
	Intention	0.512	**0.866**				
	Knowledge	0.288	0.340	**0.861**			
	Religiosity	0.272	0.323	0.255	**0.809**		
	Reputation	0.807	0.451	0.208	0.318	**0.915**	
	Trust	0.783	0.478	0.272	0.320	0.813	**0.944**
Inexp	Integrity	0.917					
	Intention	0.574	**0.885**				
	Knowledge	0.264	0.320	**0.890**			
	Religiosity	0.407	0.282	0.322	**0.805**		
	Reputation	0.873	0.584	0.249	0.380	0.937	
	Trust	0.785	0.501	0.301	0.437	0.747	0.949

Second, the invariance measurement across the groups was also performed to assess our model. Before conducting MGA, the factor loadings between the groups are compared to assess the acceptability of the measurement models in all group contexts and establish the measurement invariance (Hair et al., 2017). Table 3 shows that the items of I3, I4, Int1, and K3 amongst generations are significantly different. On the other hand, items of Int1 and Rep3 are significantly different between the experience and in-experience groups. The result suggests that the items are omitted for each group of analysis.

Structural Model Evaluation

Once the measurement model is established, we then assess the structural model and MGA. Before focusing on path coefficient comparison for each generation and level of experience as *wakif*, we were checking and comparing coefficient determination (R-squared) and the model fit criteria for each sub-group. These two measurements are used to evaluate which sub-groups (in term of generation and experience in cash *waqf* participation) fits the most with our model. The values of R-square indicate the explanatory power of independent variables to explain the dependent variables. The result in Table 4 shows that the variation between subgroups is relatively close. The intention can be explained around 37% to 19%, in which the highest explanatory power is for Gen X, and the lowest one is for Gen Z. The explanatory power for trust and reputation are even closer and bigger than intention. It arranges between 77% to 65% and 76% to 63% consecutively. It means that the independent variable used in the model is relatively powerful in explaining trust and reputation without significant differences between the subgroups.

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Table 4. Coefficient Determination (R-square) of the Model

Dependent Variables	R-square					
	Entire Sample	X	Y	Z	Exp.	Inexp.
Intention	0.281	0.372	0.275	0.190	0.296	0.283
Reputation	0.710	0.680	0.742	0.635	0.651	0.763
Trust	0.713	0.675	0.742	0.771	0.714	0.651

In terms of the model fit, Table 5 shows that the model used in this study is fit for all sub-groups. This can be seen from the value of SRMR being lower than 0.08, and that of NFI is closed to 1. It also means that the model used in this study is able to perform estimations across different sub-groups.

Table 5. Model Fit Criteria

Criteria	R-square					
	Entire Sample	X	Y	Z	Exp	Inexp.
SRMR	0.053	0.071	0.056	0.073	0.061	0.060
d_ULS	0.427	0.769	0.473	0.824	0.708	0.682
d_G	0.315	0.403	0.392	0.550	0.344	0.427
Chi-Square	1322.806	599.788	817.141	300.931	793.519	523.263
NFI	0.852	0.798	0.838	0.765	0.844	0.835

RESULT AND DISCUSSIONS

Table 6 shows the demographic details of our 658 respondents. Half of the respondents come from Gen Y (50%). The rest are spread to Gen X and Gen Z consecutively for 36% and 14%. The entire sample is Muslims who generally have good educational backgrounds (Diploma, Bachelor's, and Postgraduate account for 84% of the sample). Their domiciles are diverse, from the most concentrated on Java Island to the least concentrated on Papua Island. Moreover, more than half of our respondents had an Islamic education background.

Table 6. Respondent Characteristics

	Demographic Information	X(%)	Y(%)	Z(%)	Pool(%)
Generation	X				237(36)
	Y				329(50)
	Z				92(14)
Sex	Male	155(65)	211(64)	36(39)	402(61)
	Female	82(35)	118(36)	56(61)	256(39)
Marital status	Single	5(2)	100(30)	87(95)	192(29)
	Widower/divorce	5(2)	(0)	(0)	5(1)
	Married	227(96)	229(70)	5(5)	461(70)

	Demographic Information	X(%)	Y(%)	Z(%)	Pool(%)
Education	Elementary School	(0)	3(1)	(0)	3(1)
	Senior High School	17(7)	20(6)	64(70)	101(15)
	Diploma	4(2)	17(5)	(0)	21(3)
	Bachelor	123(52)	196(60)	28(30)	347(53)
	Postgraduate	93(39)	93(28)	(0)	186(28)
Income	Less than Rp2.000.000	41(17)	106(32)	73(79)	220(33)
	Rp2.000.000-Rp4.999.999	76(32)	87(26)	15(16)	178(27)
	Rp5.000.000-Rp9.999.999	57(24)	76(23)	4(4)	137(21)
	Rp10.000.000-Rp19.999.999	38(16)	44(13)	(0)	82(13)
	Rp20.000.000 or more	25(11)	16(5)	(0)	41(6)
Islamic edu background	Yes	137(58)	187(57)	58(63)	382(58)
	No	100(42)	142(43)	34(37)	276(42)
Province	Bali	2(1)	1(0)	(0)	3(1)
	Java	163(69)	239(73)	72(78)	474(72)
	Borneo	8(3)	11(3)	2(2)	21(3)
	Nusa Tenggara	2(1)	6(2)	(0)	8(1)
	Papua	2(1)	(0)	(0)	2(0)
	Sulawesi	17(7)	22(7)	1(1)	40(6)
	Sumatera	43(18)	50(15)	17(18)	110(17)

Table 7 illustrates the level of trust of our respondents across different generations and experience with *awqf* institutions. In general, the respondents show quite a good level of trust, reaching almost 5 out of 6 scores. As predicted, the level of trust of those who have donated *waqf* prior to the survey is higher than the otherwise (i.e., 5.06 vs. 4.82). The difference between the two is significant at the 1% level. As far as the different generations are concerned, there are small yet significant distinctions in trust levels, especially between Gen Z and Y as well as Gen X and Y. Gen Y scores the lowest trust level, even lower than the average of the entire sample. On the other hand, the youngest generation Gen Z seems to have the highest trust score. It is significantly higher, at a 5% level than Gen Z. However, its spread with Gen X is small and insignificant.

Table 7. The Result of t-test between Trust of Gen Y and Z

	Entire Sample	Gen X	Gen Y	Gen Z	Exp.	Inexp.
Trust (Mean)	4.97	5.02	4.91	5.09	5.06	4.82
Gen Y (t-stat)		1.50*				
Gen Z (t-stat)		-0.63	-1.71**			
Inexp. (t-stat)					-3.07***	

Note: Exp. and Inexp. stand for experienced donors and inexperienced donors, respectively. ***, **, and *significant at 1%, 5%, and 10% for two-tailed hypothesis.

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In summary, our descriptive analysis suggests that, unlike the conventional belief, the respondents' level of trust is relatively high. On a scale of 0 to 100, it scores 79.42. There are also some variations in the level of trust across different generations in the sample. It seems that generation Y has a significantly lower score than the other two generations. While the trust level of Gen Z is the highest, it is insignificantly different from Gen X. The descriptive statistics also suggest that the experienced donor seems to have a higher level of trust. The fact that they have engaged with the *awqf* institutions may increase their trust in other *awqf* institutions as well.

PLS-SEM Analysis

Determinants of Trust

Our PLS-SEM results from the entire sample show that all determinant variables of trust are significant (see Table 8). Reputation becomes the most vital determinant of trust, followed by integrity, religiosity, and knowledge, as far as the path coefficients are concerned. This is worth noting that reputation is also influenced by integrity with considerable and statistically significant magnitude.

Table 8. PLS-SEM Results

Causal Relationship	Path Coefficient					
	All	Gen X	Gen Y	Gen Z	Inexp	Exp
Integrity -> Reputation	0.843***	0.825***	0.861***	0.797***	0.873***	0.807***
Integrity -> Trust	0.358***	0.362***	0.334***	0.400***	0.508***	0.343***
Knowledge -> Intention	0.237***	0.399***	0.123**	0.170	0.179**	0.200***
Knowledge -> Trust	0.059**	0.108*	0.038	0.089	0.070	0.054*
Religiosity -> Intention	0.147***	0.133**	0.145***	0.123	0.036	0.152***
Religiosity -> Trust	0.082***	0.052	0.095***	0.208***	0.116**	0.051*
Reputation -> Trust	0.465***	0.433***	0.503***	0.383***	0.242*	0.509***
Trust -> Intention	0.316***	0.255***	0.390***	0.271**	0.432***	0.375***

Note: Exp. and Inexp. stand for experienced donors and inexperienced donors, respectively. ***, **, and *significant at 1%, 5%, and 10%.

These findings tend to be consistent across different generations, even though a few variations are observed. For instance, the religion variable is not a determinant of trust for Gen X, while knowledge is also insignificant for Gens Y and Z. This pattern is interesting. It suggests that religiosity determines trust in the late generations but not in the older ones. On the other hand, knowledge about *waqf* does not really matter to the younger generation. Unlike Gen X, Gens Y and Z do not price knowledge in their trust towards *awqf* institutions. This may be due to their relatively well-accessed information through the internet and other means of information and communications. The order across generations tends to be similar to the entire sample except for Gen Z.

The youngest generation seems to account for integrity more than reputation. The results also indicate the variations across samples that have engaged with *awqf* institutions and have not. In the former, all determinants of trust are significant, while knowledge does not influence trust in the latter. This finding is consistent with the intergenerational analysis because most of the inexperienced respondents come from Gens Y and Z.

Between Trust and Intention

Table 8 also shows that trust strongly influences intention. This is robust in all subsamples, regardless of the generations and experience of the respondents. Gen Y has the highest path coefficient over the other generations. On the other hand, the influence of trust on intention is more substantial in inexperienced respondents as compared to the experienced ones. This illustrates that the role of trust in influencing the intention to endow cash *waqf* is higher for those who have not previously done the same. The fact that the older generation X, who are relatively experienced ones, has a lower path coefficient confirms this conclusion.

The Roles of Trust on Knowledge and Religiosity

Our findings suggest that knowledge about the cash-*waqf* and its institutions influence intention directly and indirectly through a trust (see again Table 8). Knowledge has a significant direct influence on intention in all generations, except for Gen Z. It seems that for the youngest generation, information about the cash-*waqf* is a fundamental aspect that does not make any difference in their intention.

Table 9. Specific Indirect Effect

	Specific Indirect Effect					
	All	**X**	**Y**	**Z**	**InExp**	**Exp**
Integrity -> Trust -> Intention	0.1368***	0.092***	0.130***	0.108*	0.219***	0.129***
Knowledge -> Trust -> Intention	0.021**	0.028	0.015	0.024	0.030	0.020*
Religiosity -> Trust -> Intention	0.029***	0.013	0.037***	0.056*	0.050**	0.019
Reputation -> Trust -> Intention	0.152***	0.110***	0.196***	0.104*	0.104	0.191***
Integrity -> Reputation -> Trust -> Intention	0.128***	0.091***	0.169***	0.083*	0.091	0.154***
Integrity -> Reputation -> Trust	0.362***	0.357***	0.433***	0.305***	0.211*	0.411***

Note: Exp. and Inexp. stand for experienced donors and inexperienced donors, respectively. ***, **, and * significant at 1%, 5%, and 10%.

Our further investigations illustrated in Tables 9 and 10 also show how trust is central to the effects of knowledge and religiosity on intention, primarily in the

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cross-generational analysis. The previous Table 8 indicates that knowledge is not a significant determinant of intention to endow cash *waqf* for Gen Z, unlike for other generations. Table 9 also confirms that the indirect effect of knowledge on intention through trust is also not significant. However, when we take the total effect, as shown in Table 10, into account, we document that the relationship between knowledge and intention is significant at 10% in Gen Z. This indicates the critical role of trust as the mediating channel for Gen Z's knowledge to influence intention to donate cash *waqf*.

A similar case also applies in the case of religiosity. In general, religiosity has a direct and indirect effect on intention. However, Table 8 also indicates that, unlike in the other generations, religiosity is not a determining factor of intention for Gen Z. However, we observe from Table 9 that its indirect influence on intention to endow cash *waqf* through trust is significantly positive at 10%. This ultimately makes the total effect of the religiosity coefficient on intention positive, as reported in Table 10. This again shows how crucial trust is in moderating the relationship between religiosity and intention, as far as Gen Z is concerned.

Table 10. Total Effect

Causal Relationship	Total Effect					
	All	X	Y	Z	InExp	Exp
Integrity -> Intention	0.237***	0.183***	0.299***	0.191**	0.310***	0.282***
Knowledge -> Intention	0.255***	0.427***	0.138**	0.194*	0.209***	0.220***
Religiosity -> Intention	0.173***	0.146**	0.182***	0.179*	0.086	0.171***
Reputation -> Intention	0.147***	0.110***	0.196***	0.104*	0.104	0.191***
Trust -> Intention	0.316***	0.255***	0.390***	0.271**	0.432***	0.375***

Note: Exp. and Inexp. stand for experienced donors and inexperienced donors, respectively. ***, **, and * significant at 1%, 5%, and 10%.

This result has nontrivial implications. For those who have not experienced donors, who are likely coming from Gen Z, religiosity cannot directly affect intention. It rather needs to escalate the trust first before impacting the intention to donate cash *waqf*. On the other hand, for the oldest generation X, religiosity does not need to influence trust before affecting intention. This might be because Gen X has already built their own trust in the *waqf* institutions. The relatively mature age of this generation may also result in the agnostic its trust towards religiosity (and, to some extent, knowledge that is only significant at 10%).

Increasing *Waqf* Participations

Cash *waqf* is deemed one innovation in Islamic social finance, offering flexibility instead of the rigidity of traditional *waqf* (Çizakça, 1998). This has the potential to revive the *waqf* as a crucial development vehicle of the Muslim world (Çizakça, 1995).

However, the realization of cash *waqf* remains far from its potential even in Indonesia, the most populous Muslim country that has launched the GNWU and combined cash *waqf* with sukuk (i.e., blended finance).

The results of this study evidence that the role of trust cannot be neglected as an important factor in increasing public participation in *waqf* endowment. This is true in the level entire analysis of data but also subgroup level (both across generations and empiricism in *waqf* participation). This study confirms the result of the previous study by Shukor et. (2018) in the spatial context of Malaysia. This finding holds across different generations and is agnostic to the level of donors' experience. Indeed, we observe that the magnitude of the impact of trust on intention seems to be higher in the younger generations and those who have not donated any cash *waqf* before (inexperienced). This result is plausible, as those types of donors, by definition, need to gain trust to feel more comfortable donating in cash *waqf*, in harmony with Melendéz (2001). Thus, the effect of trust on intention is higher in those types of donors than in the older ones.

Furthermore, this study suggests that the *awqf* institution should take trust as a crucial issue in improving the optimality of cash *waqf* collection. While the previous studies also concur with the same implication as ours, such as Shukor et al. (2018), Melendéz (2001), Haidlir et al. (2021), and Kasri & Chaerunnisa (2022), our study goes the extra mile by confirming this conclusion across different generations X, Y, and Z. It is acknowledged that different characteristics of generations may influence differences in the role of trust. However, our study advocates that the importance of trust applies to any generation. Thus, *awqf* institutions need to focus on improving this aspect in their *waqf* management to appeal to all generations.

Our findings also suggest that integrity and reputation are significantly affecting the intention to donate in cash *waqf*, consistent with Shukor et al. (2018). There are three interconnected aspects involved in describing integrity; (i) a stable set of most cherished values and principles that are fairly reasonable and relatively firm, (ii) verbal behavior in expressing values and principles, and (iii) the commitment to carry out these values and principles following the verbal expressions. It implies that there is a requirement for *awqf* institutions to actively involve themselves to show their commitment not only in action but also in a verbal way. Furthermore, the significance of reputation in building trust also suggests that *awqf* institutions to spread their honesty and concern through sharing and broadcasting information about what the organization does (Doney & Cannon, 1997; Granovetter, 1985). Related to this implication, programs such as GNWU should be complemented by sounding a good reputation of *awqf* institutions in Indonesia. This is crucial to cover the role of trust in creating the intention of the public to participate in cash *waqf* for any targeted group.

However, beyond Shukor et al. (2018), we also document that religiosity and knowledge, in general, are also positive determinants of trust and intention. Different from previous studies on the effect of these two factors on Islamic economic-related

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activities (see Johari et al., 2015; Osman et al., 2016; Baqutayan & Mahdzir, 2017; Shukor et al., 2017; Aziz & Chok, 2013; Hamdan et al., 2013; Vanany et al., 2019, Haidlir et al.,2021; and Kasri & Chaerunnisa, 2022), this study not only assesses its direct impact on intention but also scrutinizes the role of trust to create this behavior across generations and empiricism in *waqf* participation.

The roles of religiosity and knowledge are nontrivial. Religiosity is a strong determinant of trust across different generations, but Gen X. Along with knowledge; religiosity also has a significant impact on intention almost in any generation, except for Gen Z. In Gen Z, knowledge of the cash *waqf* seems to be not too important in determining their intention, not even indirectly through a trust. This may be due to the fact that Gen Z is by default exposed to so much information as their digital literation is very high. As far as religiosity is concerned, the intention to donate in cash *waqf* is influenced by religiosity indirectly through trust. The distinctive behavior between these generations confirms the previous studies on the effect of personality and character among generations in *waqf* participation (Lambert 1972; Kovic & Hansli 2018). Although it is not clearly founded in the context of trust in persuading the intention, it is coming out in the variation of trust determinant.

Finally, this finding brings us to acknowledge the role of trust even more. Our study shows that trust not only directly impacts the intention but also takes a significant role as a transmitter of other related factors in increasing cash *waqf* participation. The variation of this role across generations also gives insight into the *awqf* institution to more than just concern about how to build trust. It is also more precise about how to adjust the strategy in building trust in a different targeted group, especially how to treat a group with different levels of religiosity and knowledge. Therefore, the insight from this result could be taken as guidance to derive a dynamic strategy and approach by *awqf* institution to optimize the *waqf* collection in general and GNWU program in specific. Leveraging strategies through trust issues is the need of the hour for *awqf* institutions. Building integrity, reputation, and trust is truly the complete domain of the *awqf* institution. It needed to strengthen the value proposition of cash *waqf* across different generations and markets.

CONCLUSION

Our study explores the lack of cash-*waqf* realization puzzle in Indonesia after the country launched the GNWU and issued a series of CWLS. We scrutinize the importance of trust in determining donors' intention to endow cash *waqf*. This study also examines the key drivers of trust per se. The analysis is performed across different generations and levels of donors' experience by employing the PLS-SEM method for 658 intergenerational respondents.

Three main conclusions can be drawn from this study as follows. First, our study evidences the importance of donors' trust in their intention to endow cash *waqf*. The role of trust in determining intention to donate is robust across generations and

agnostic to whether the donors are new or repeating ones. Moreover, we also document that our two additional determinant variables, namely religiosity and knowledge, also have positive impacts on intention to donate cash-*waqf*, even though the magnitudes are lower than trust. Interestingly, the latter finding (on religiosity and knowledge) comes with intergenerational variations, where knowledge has no significant effect on trust in the younger Gen Z while religiosity has no significant impact on trust in the older Gen X.

Second, our findings also suggest that integrity and reputation are the main determinants of trust towards *awqf* institutions, consistent with the previous literature. This finding is robust across different generations. Beyond the two common factors, we also document that religiosity and knowledge, in general, also have positive determining factors towards trust. However, we observe variances across different generations. Knowledge affects trust only in Gen X, while religiosity influences trust in all generations except X.

Interestingly our study also denotes findings that have yet to be uncovered by the previous literature, to the best of our knowledge. Our model illustrates that there is a role of trust in determining the positive impact of religiosity and knowledge on intention, as far as intergenerational analysis is concerned. For the youngest Gen Z, religiosity and knowledge cannot influence the donor's intention to endow cash *waqf*, except when the donor trusts the *awqf* institution. This result signifies the importance of trust in the donation behavior of Gen Z.

The main implications of our study are twofold. First, knowing and targeting the potential donors of *waqf* are important for *awqf* institutions. Profiling them with respect to the generation there belong to is a very good start. Our finding implies that offering even more trust-enhancing programs for the inexperienced younger generations is crucial as their intention to endow cash *waqf* is highly sensitive to trust. This is worth noting that those young generations account for the majority of potential cash *waqf* donors. Moreover, this study implies that in a technical way both government and *awqf* institutions not only need to tell the story of the good sides of *waqf* and its program but also send a message about the good integrity and reputation of *awqf* institutions and cash *waqf* management in general. This persuasion approach is more crucial for young generations (especially Gen Z).

Second, while trust may have contributed to the lack of cash *waqf* donation, the current level of trust in the *waqf* institutions is quite high. This indicates something is missing in action, where trust is transmitted to intention but may not be converted into behavior. In this respect, offering convenient and easy-to-donate cash *waqf* can be an excellent initial way forward. There is also a hypothetical probability that the current trust is purposed to the specific or personal *awqf* institution (*nazhir*) such as a mosque and public figure. Faster integration of *nazhir* data and collaborative action between *awqf* institutions and public figures may lead to a good impression of the public to participate in cash *waqf*. Of course, this entire thesis deserves further research.

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The Influence of Halal Lifestyle on Career Women in Indonesia

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Abstract

The halal industry is experiencing rapid development, one of which is the increasing demand for halal products. Studying the halal lifestyle for career women is interesting because of the growing development of Muslim fashion and halal cosmetics. The originality of this research lies in a comprehensive study of the halal lifestyle in career women. This study aimed to determine the effect of religiosity, knowledge, awareness, and social environment on the halal lifestyle of career women in Jakarta Province. The respondents were 250 Muslim career women. The method of this research used the SEM-PLS method. The results of this research indicated that the variables of religiosity, awareness, and social environment significantly affect the halal lifestyle. Meanwhile, the knowledge variable does not affect the halal lifestyle. This research implies that halal industry producers must increase intense outreach and education to the public, especially among career women.

Keywords:
career women; halal lifestyle; religiosity; awareness; social environment

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INTRODUCTION

As a country with a majority of Muslim population, it is time that the halal lifestyle can develop properly (Adinugraha et al., 2019; Aziz & Ahmad 2018; Boediman, 2017; Jailani & Adinugraha, 2022; Pratama & Sundari, 2019; Sarasati, 2018). Harahap et al. (2022) said that currently Indonesia's Muslim population accounts for 12.7% of the total world Muslim population, and 86.88% of the total population of Indonesia. According to the Indonesia Halal Lifestyle Center, (2022) until 2020 the world's Muslim population will reach 1.9 billion people or 25% of the total global population. The Muslim population in Indonesia is around 231 million (Data Portal of the Ministry of Religion of the Republic of Indonesia, 2022). Muslim consumers consider numerous factors when buying a product. This situation provides an opportunity to adopt a halal lifestyle. According to Euromonitor International, a global market research company that produces halal products in the five countries with the largest Muslim populations, such as Indonesia, Pakistan, India, Nigeria, Iran has grown by 257 (%) percent. Today, halal is both a law and a lifestyle. Food, fashion, cosmetics, education, finance, medicines, media, recreation, health, and fitness are all examples of Halal Lifestyle (Aziz & Ahmad, 2018; Boediman, 2017; Jailani & Adinugraha, 2022; Sarasati, 2018).

Globally, Muslim consumers are spending two trillion dollars on the food and lifestyle sector by 2021 (Thomson Reuters, 2021). Meanwhile, in Indonesia Muslim consumers spend 184 million dollars and it can be shown that the spending of Indonesian Muslim consumers is the largest halal market. In the food sector, Indonesian Muslim consumers spend US$135 billion. In the financial sector, spending by Indonesian Muslims reached US$119.5 billion. In the travel sector, spending 3.37 billion US dollars. In the fashion sector, US$15.6 billion, the media and leisure sector, spent US$20.73 billion. Then, on pharmaceuticals, the spending is US$ 5.13 billion. Finally, in the cosmetics sector, Indonesian Muslims spent US$4.19 billion (Thomson Reuters, 2021).

Indonesia ranks first with 146.7 billion of the total consumption expenditure figures of the global Muslim community so that sharia-based industries are increasingly being eyed by business actors and become a new market share to gain more profits. This condition has an impact on the increasing number of opening new sharia business lines that continue to grow (Ab Manan et al., 2017; Widiastuti et al., 2020). However, amid the famous halal market, the interest in halal products can still be said to be low. Muslim expenditure on halal products demonstrates this. Halal food and beverages differ from halal products. Muslims spend $135 billion on halal food, more than any other sector.

Harahap et al. (2022) explained that the external and internal factors that influence the halal lifestyle are experience, personality, motives, and perceptions (internal factors), while external factors are culture, family, social environment, and demography. Pratama & Hartati, (2021), Setyowati & Anwar, (2022), and Sobari et al., (2022) explained that religion is an important factor in deciding the level of someone's religiosity can be shown from how much a person is involved in faith in his life. The higher the level of one's religiosity, the greater the potential to carry out a halal lifestyle.

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Alviah et al. (2018) stated that knowledge of the concept of halal influences a halal lifestyle. Knowledge affects how one interprets a product. Increasing public knowledge about the importance of a halal lifestyle will prevent them from doing things that are prohibited by Islamic law (Aziz & Ahmad 2018; Jailani & Adinugraha, 2022; Pratama & Sundari, 2019). According to Mutmainah (2020), religiosity, awareness, and halal certification will influence people's intention to buy halal food. The public's consideration in buying halal food is not only about religion, but also as a guarantee of food safety, in which halal food must have good quality and avoid things that may cause disease. There is an increase in awareness triggered by the desire to improve and maintain the quality of life. Muslim consumers realize that adopting a halal lifestyle can keep them away from bad things.

Some studies found that halal awareness affects people's buying interest (Aslan & Aslan, 2016; Handriana et al., 2020; Haque, 2019; Silalahi et al., 2022). So, it can be concluded that awareness influences the halal lifestyle. The social environment can also affect a person's lifestyle, which is the feeling of wanting to be recognized causes a person to choose a lifestyle. Othman et al. (2017) in his research also said that the social environment influences the lifestyle of adolescents in rural areas. Consumption is not only a biological need but also a symbol of one's social status.

The growing number of institutions and workplaces that allow women to wear hijab shows that Indonesian Muslims can openly express their identity as a Muslim, including many women who are increasingly concerned about the halal lifestyle (Virga, 2018). This can be seen from the increasing number of hijab users and cosmetics with the halal logo that continues to increase, including among career women. Firdaus et al. (2022), Handriana et al. (2020), Silalahi et al. (2022), and Susilowati et al. (2018) stated that someone will be willing to pay more for halal products because they believe that halal products are guaranteed quality and safety. In line with the development of the halal lifestyle, the halal industry has expanded significantly as Muslim consumers want more halal products for their daily needs.

The lifestyle of Muslim women in urban areas has a tendency to appear dazzling as a form of reflection of cultural forms and is a special feature that can strengthen social relations and the scope of society in their social environment (Ulya, 2018). Basically, women always want to look good all the time, especially for working women who are required to look neat as a form of professionalism in the world of work (Aziz & Ahmad, 2018). To look good, Muslim workers buy halal products. A career woman's interest in buying halal products is tied to her independence and income. The higher their income, the more they have to spend on their lifestyle. This is in line with research Adinugraha et al. (2019) and Jailani & Adinugraha (2022) that an increase in the purchasing power of Muslims can influence the trend of the halal lifestyle to be developed further.

Women's income in the city of Jakarta reached 38.06% and was ranked second for Java Island in Java Island. The large contribution to the income of women in Jakarta Province certainly brings fresh air for the potential of a halal lifestyle. This potential

surely must be maximized, so that the halal economy can develop better. In terms of religiosity, knowledge, awareness, and social environment, this study aims to measure whether these four variables can influence the halal lifestyle of career women in Jakarta Province. Even though there have been several studies related to halal lifestyle, there are differences in studies such as: Aziz & Ahmad (2018) examines the halal lifestyle of working women focusing on clothing, segregation of workplaces and social rules between women and men, entertainment must be polite and limits on association in the workplace with the opposite sex. Different from Ulya (2018) that examines the halal lifestyle of cosmopolitan Muslim women using Islamic symbols to gain economic benefits. Meanwhile, Virga (2018) explained the lifestyle of Indonesian Muslim women in television advertisements representing active women with various activities by wearing closed-clothes and hijab is a proof that hijab does not limit women's activities. Other research examined community empowerment through education and literacy of the halal lifestyle movement (Vita et al., 2022). No study has examined how religiosity, knowledge, awareness, and social environment affect career women's halal lifestyle in Jakarta Province. Therefore, this research fills a gap and is novelty by studying career women with these variables. The researchers hope that knowing the effect of these variables on the halal lifestyle can develop halal lifestyle trends and maximize the growth of the halal industry to increase the income of the Indonesian people.

METHODS

This study used a quantitative method, in which distributing questionnaires through Google Form and direct interview with respondents collects the data. This research is using random sampling technique. The respondents in this study were 250 Muslim women who have personal income with halal lifestyle and live in Jakarta Province. The questionnaire was prepared using a Likert scale with a rating range of 1-5.

Table 1. Operational Definition of Research Variables

No.	Variable	Dimensions	Indicator
1.	Religiosity	Intellectual	Participate in activities at the mosque
			Fasting
		Ritualistic	Walk the prayer
		Ideology	Doing *zakat/infaq/sodaqoh*
		Experience	Attending religious studies can increase knowledge
		Consequence	Following religious accounts on social media
2.	Knowledge	Knowledge products	Knowledge of halal and haram products
			Knowing the raw materials contained in the product
			Knowing the types of Islamic finance
			Knowing the location of halal tourist destinations
		Purchase Knowledge	Having knowledge about the purpose of consuming halal products to improve physical and spiritual health.
		Usage Knowledge	Knowing how to recognize halal products

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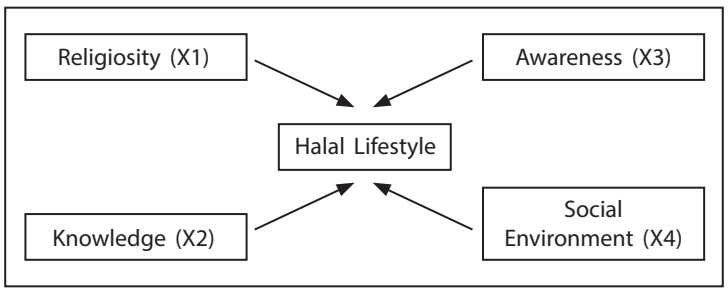
No.	Variable	Dimensions	Indicator
3.	Social environment	Family environment	Getting an Islam education from an early age
			Buying products recommended by family and friends
			Visiting tourist destinations recommended by family and friends
			Visiting restaurants and cafes labeled halal recommended by family and friends
		Work environment	Applying sharia principles to the work system
			Utilizing Islamic banks for salary payment
		Public	Knowing the halal information that is on social media
			Following the halal trend carried out by Muslim influencers
4.	Awareness	Knowledge	Realizing that avoiding haram foods and usury is an obligation because it has been regulated in the Al-Quran and Hadith
			Halal lifestyle starts within yourself
		Attitude	Participate in halal campaigns
			Living a halal lifestyle is a form of awareness as a Muslim
		Action	Ensuring the products used are permitted by the religion
			Applying sharia principles as self-responsibility
5.	Halal Lifestyle	Activity	Using closed clothing
			Consuming halal food
			Having a Sharia account
		Interest	Not interested in using financial services at conventional banks
			Following religious studies
			Participating in research on social media
			Visiting halal tourist destinations
		Opinion	Running a halal lifestyle because it is in accordance with the shariah
			Halal products can increase self-confidence

The data processing used SEM-PLS, so that the research framework shows in Figure 1. In addition, an explanation of the operational definition of the variable is shown in table 1. The questionnaire consists of four sections where three variables are part of the independent variables and one variable is the dependent variable.

Figure 1. Research Framework



RESULTS AND DISCUSSIONS

The description of the respondent's profile in this study shows in table 2**.** It is known that with a sample of 250 people with an age range of 20-25 years there are 146 people or 58.4%, for ages 26-30 years there are 66 people or 26.4%, then for those aged 31-35 years there are as many as 22 people or 8 .8%, and finally 36-40 years old as many as 10 people or 4%. Based on the type of work, there were 27 respondents working as casual workers with a percentage of 10.8%, 133 respondents working as private employees with a percentage of 53.2%, 16 respondents working as civil servants with a percentage of 6.4%, 34 respondents working as professionals with a percentage of 13.6%, respondents who worked as entrepreneurs amounted to 28 people with a percentage of 11.2%.

As for the respondents who have income from 4,500,000 to 10,000,000, there are 228 people with a percentage of 91.2%, respondents who have income from 10,000,001 to 20,000,000 there are 15 people with a percentage of 6%, respondents who have income of 20,000. 001 to 30,000,000 are 2 people in total or 0.8%, respondents who have a large income of 30,000,001 amount to 5 people with a percentage of 2%.

Table 2. Respondent Profile

Items	Respondents	
	n	***Percentage***
Age		
20 - 25	146	58.40%
26 - 30	66	26.40%
31 - 35	22	8.80%
36 - 40	6	2.40%
40 >	10	4%
Work		
Freelance	27	10.8%
Private sector employee	133	53.2%
Civil servant	16	6.4%
Professional	34	13.6%
Businessman	28	11.2%
Other	12	4.8%
Income		
4,500,000 – 10,000,000	228	91.2%
10,000,001 – 20,000,000	15	6%
20,000,001 – 30,000,000	2	0.8%
> 30.000,001	5	2%
Domicile		
West Jakarta	38	15.20%
Central Jakarta	39	15.60%
South Jakarta	98	39.20%
East Jakarta	50	20%
North Jakarta	22	8.80%
Thousand Islands	3	1.20%

Source: Research findings (2022)

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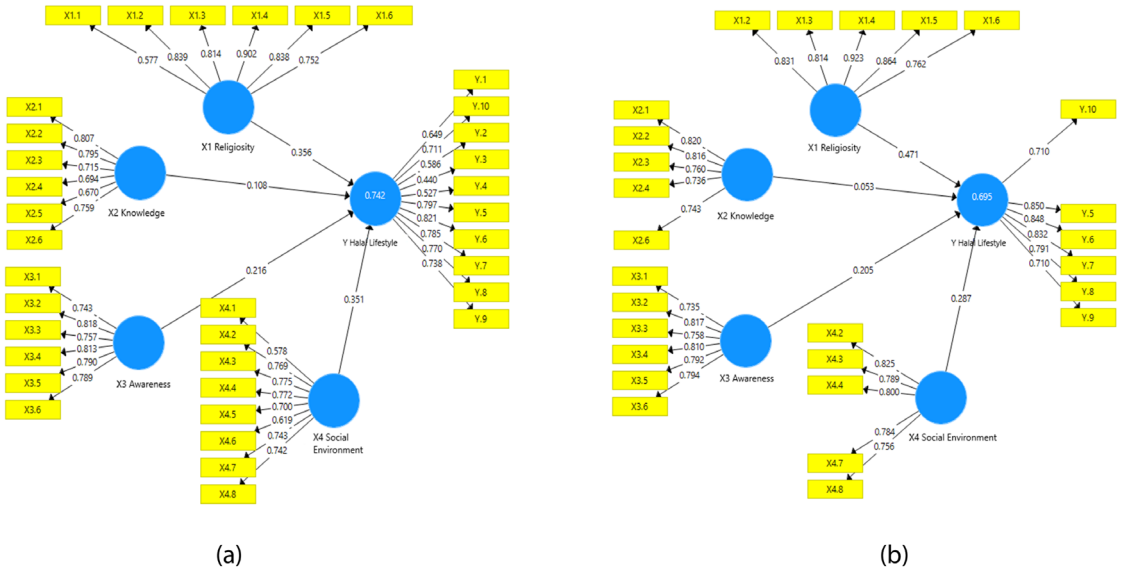
Figure 2. (a) Loading Factor and (b) Loading Factor Customized



Source: PLS Processing

Meanwhile based on domicile, respondents who live in West Jakarta amount to 38 people with a percentage of 15.2%, respondents who live in Central Jakarta amount to 39 people with a percentage of 15.6%, respondents who live in South Jakarta amount to 98 people with a percentage of 15.6 %. Percentage of 39.2%, respondents who live in East Jakarta are 50 people with a percentage of 20%, respondents who live in North Jakarta are 22 people with a percentage of 8.8%, respondents who live in Seribu Island are 3 people with a percentage of 1, 2%. To find out whether an indicator is correct or valid in measuring a variable, the convergent test is used (Hair et al., 2021). The way to find out is to use the Loading Factor value, if an indicator has a value > 0.

In figure (a) the loading factor has several factors that have values below 0.7. That is, X1.1, X2.3, X2.4, X4.1, X4.5, X4.6, Y.1, Y.2, Y.3, Y.4 have a value below 0.7. After the value is adjusted by eliminating values that are below 0.7, so that the remaining indicators meet the conditions specified in figure (b).

Table 3. Average Variant Extracted (AVE)

Variable	Average Variance Extracted (AVE)
X1 (Religiosity)	0,707
X2 (Knowledge)	0,602
X3 (Awareness)	0,616
X4 (Social Environment)	0,626
Y (Halal Lifestyle)	0,628

Source: Research finding

The next step to be taken is to look at the Average Variant Extracted (AVE) value. for an indicator to be valid, the variable must have an AVE value > 0.5. It is known

that all variables already have an Average Variant Extracted (AVE) value above 0.5 to be categorized as meeting the criteria (Hair et al., 2021).

Table 4. Fornell-Larcker

Variable	X1 (Religiosity)	X2 (Knowledge)	X3 (Awareness)	X4 (Social Environment)	Y (Halal Lifestyle)
X1 (Religiosity)	0.841				
X2 (Knowledge)	0.592	0.776			
X3 (Awareness)	0.417	0.569	0.785		
X4 (Social Environment)	0.515	0.563	0.562	0.791	
Y (Halal Lifestyle)	0.736	0.610	0.593	0.675	0.792

Source: Research finding

In Table 3, it can be seen that all variables already have an Average Variant Extracted (AVE) value above 0.5, so that it can be said to be in accordance with the criteria (Hair et al., 2021). The step to find out the results of the discriminant validity test can be known by using the loading cross value. Each variable meets the same variable and must have a loading cross value that is higher than the other variables. To find out the value of the loading cross for each variable, the Fornell-Larcker method is used. The table below shows that all values on the yellow line have the highest value compared to the other values.

For the data to meet the requirements of discriminant validity, it can be seen from the value of each root variable that must have a higher value than the other variables. In the table above, all values are on the yellow line which has the highest value compared to the other values.

Table 5. Cross Loading Value

	X1 (Religiosity)	X2 (Knowledge)	X3 (Awareness)	X4 (Social Environment)	Y (Halal Lifestyle)
X1.2	0.831	0.540	0.310	0.412	0.572
X1.3	0.814	0.491	0.378	0.402	0.527
X1.4	0.923	0.502	0.355	0.467	0.673
X1.5	0.864	0.473	0.290	0.418	0.653
X1.6	0.762	0.485	0.423	0.456	0.644
X2.1	0.435	0.820	0.491	0.441	0.499
X2.2	0.488	0.816	0.524	0.513	0.493
X2.3	0.480	0.760	0.371	0.382	0.419
X2.4	0.470	0.736	0.272	0.460	0.485
X2.6	0.425	0.743	0.543	0.377	0.464
X3.1	0.220	0.316	0.735	0.291	0.311
X3.2	0.260	0.363	0.817	0.389	0.437
X3.3	0.372	0.537	0.758	0.513	0.463

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	X1 (Religiosity)	X2 (Knowledge)	X3 (Awareness)	X4 (Social Environment)	Y (Halal Lifestyle)
X3.4	0.293	0.395	0.810	0.398	0.441
X3.5	0.316	0.428	0.792	0.437	0.485
X3.6	0.440	0.568	0.794	0.546	0.581
X4.2	0.372	0.433	0.488	0.825	0.505
X4.3	0.417	0.465	0.365	0.789	0.536
X4.4	0.363	0.440	0.466	0.800	0.507
X4.7	0.416	0.428	0.529	0.784	0.555
X4.8	0.458	0.458	0.376	0.756	0.557
Y.10	0.375	0.446	0.635	0.530	0.710
Y.5	0.790	0.492	0.375	0.504	0.850
Y.6	0.682	0.498	0.493	0.602	0.848
Y.7	0.717	0.470	0.331	0.498	0.832
Y.8	0.490	0.477	0.412	0.604	0.791
Y.9	0.350	0.535	0.648	0.478	0.710

Source: Research finding

Then the next criterion is the correlation between each variable indicator and the variable itself must be higher than the indicator with other variables. The table below shows that all values on the yellow line have the highest value compared to the other values.

Table 6. Composite Reliability and Cronbach's Alpha

Variable	Cronbach's Alpha	Rho A
X1 (Religiosity)	0.895	0.900
X2 (Knowledge)	0.834	0.837
X3 (Awareness)	0.877	0.887
X4 (Social Environment)	0.850	0.850
Y (Halal Lifestyle)	0.881	0.890

Source: Research finding

To determine the reliability test, it can be seen through the value of composite reliability and Cronbach's alpha where if a variable has a value > 0.70, then the variable already meets composite reliability and Cronbach's alpha (Hair et al., 2021). Based on table 6, the value of composite reliability and Cronbach's alpha for all variables has a value of more than 0.70, so that it can be said to meet the requirements. Thus, it can be concluded that all the variables in this study already have the appropriate level of reliability.

Table 7. R-Square Value

Variable	R Square
Y (Halal Lifestyle)	0.695

Source: Research finding

Based on table 7, the R-Square test value for the Halal Lifestyle variable is 0.695, so it can be said that the variables of religiosity, knowledge, awareness, and social environment are able to explain the halal lifestyle by 69% while 31% is explained by other variables. To test the hypothesis and the significance of a variable can be tested by bootstrapping calculations and then it can be analyzed through T-statistics, P-values, and the original sample contained in the path coefficient table. For the next step, look at the results of the T-statistics and P-values in the Path Coefficient section. Exogenous variables have a significant effect on endogenous variables if the T-statistic value is greater than the T-table value (1.96), then the hypothesis of a study can be accepted if the P-value <0.05.

Furthermore, to find out whether the Y variable influences the X variable, it can be seen by comparing the statistical values with the t-table. If the t-statistic value is greater than the t-table value, it can be concluded that the Y variable influences the X variable. In this sample, it is known that the t-table used is 1.96 using path coefficient analysis.

Figure 3. Bootstrapping

Source: Research finding

The results of this study are religiosity (X1) has a significant and positive effect on halal lifestyle (Y). The results of this study have the same as the results of research conducted by Haque (2019), Jannah & Al-Banna (2021), Pratama & Sundari (2019), Rohmatun & Dewi (2017), Sarasati (2018), which is the fact that religiosity has a significant and positive effect on halal lifestyle. This is because the level of religiosity will have an impact on a person's preferences in carrying out their daily activities. As explained by Kasri et al. (2021), Ma'zumi & Najmudin (2017), Pratama & Hartati (2021), Sobari et al. (2022), religiosity is a form of attachment between the individual and God that is actualized in daily life.

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Table 8. Path Coefficient

Variable	Original Sample (O)	T Statistics (|O/STDEV|)	P Values
X1 Religiosity – Y Halal Lifestyle	0.471	7.146	0.000
X2 Knowledge – Y Halal Lifestyle	0.053	0.657	0.512
X3 Knowledge – Y Halal Lifestyle	0.205	2.804	0.005
X4 Social Environment – Y Halal Lifestyle	0.287	4,547	0.000

Source: Research finding

In this study, the respondents carried out a halal lifestyle because it was a responsibility to God, that is why they tend to use religion as a basis for their decision making (Rahmawati & Fitriyani, 2021). In this study, by carrying out religious orders, respondents are peaceful because they stay away from things that are prohibited by the Qur'an and Hadith. The respondents believe that fulfilling Muslim obligations will strengthen their faith and influence their lifestyle. A person with a good level of faith will choose a lifestyle that can draw him closer to Allah SWT. Respondents consider carrying out a halal lifestyle as an obligation as Muslims to get closer to Allah SWT.

The results of the study showed that knowledge (X2) has no significant effect on the halal lifestyle (Y). The results of this study are different from the research conducted by Larasati et al. (2018), which said that knowledge has a significant effect on the purchase of halal products. This research showed the same result as research conducted by Adiba & Wulandari (2018), which showed that knowledge does not affect respondents' preferences in choosing halal products. The respondents' carry out a halal lifestyle not because of how much knowledge they have about halal products, but as a form of responsibility as Muslims, and the knowledge can be used as an additional reference in choosing products.

Career women know about the *halalness* of products, how to find out about the *halalness* of a product, and are more up-to-date about halal issues. However, the amount of knowledge is not the only factor that encourages respondents to choose a halal lifestyle. Currently, there are many new halal products on the market, but career women often stick to brands they have used before due to habits, beliefs, and loyalty.

The results of the study show that awareness (X3) has a significant and positive effect on the halal lifestyle (Y). Alfikri et al. (2019), Aslan & Aslan (2016), Handriana et al. (2020), and Mutmainah (2018) explained that halal awareness affects purchase intention. Technology and information media that continue to develop causes this increase in awareness, making it easier for consumers to find information. Nusran et al. (2021) also supports the results of this study based on their research, which says that halal awareness can influence the millennials' halal lifestyle and product purchasing decisions. This shows that career women are more aware of the importance of consuming halal products.

The results of this study indicate that the social environment (X4) has a significant and positive effect on the halal lifestyle (Y). The results of this study were different

from the research conducted by Lubis & Izzah (2022), in which the social environment has no significant effect on the halal lifestyle. Currently, people are less consistent in implementing the halal lifestyle, which is caused by how people assume that all products that they purchased in their environment are halal without checking or knowing the process carried out.

Finally, a research conducted by Jumantini (2018), and Riwajanti et al. (2020) is in line with this study, it stated that social environment has a positive effect on lifestyle. They also said the feeling of wanting to be recognized in the environment can affect their lifestyle; because humans are social beings, their behavior affects others. Thus, the environment can influence the lifestyle of someone. Friendship, neighbors, coworkers, and family education can influence someone in considering a purchase decision (Gusrita & Rahmidani, 2019). This result indicated that career women who live a halal lifestyle are supported by their social environment, such as being allowed to wear hijab at work, utilizing Islamic banks to pay salaries, and having friends and coworkers who know halal and sharia products.

CONCLUSION

Three variables that affect the halal lifestyle of career women are religiosity, awareness, and social environment. In this study, by carrying out religious orders, the respondents can feel calm because they stay away from things that are prohibited by the Qur'an and Hadith. The respondents feel that carrying out their responsibilities as Muslims will increase the degree of their faith and can influence their way of life. As a career woman living in a halal lifestyle is important, not only as a form of responsibility to Allah SWT but also as self-identity as a Muslim. A Muslim-friendly work environment also influences career women to express themselves freely as Muslims. However, the knowledge variable has no significant effect. The amount of information they have is not an important factor in encouraging respondents to choose a halal lifestyle. Currently, many new halal products have emerged, but this does not make women choose these products. This is due to habits, beliefs, and loyalty to products that has been used before.

The limitation of this research is that it only uses four variables. There are many other variables that can affect the halal lifestyle such as internal influences, namely family, education, income, and attitudes towards a halal lifestyle. In addition, this research is only limited to career women in Jakarta Province. The researchers hope that in the future, this research will cover a wider area or more than one province to get more optimal comparison results. Finally, the researchers hope that the government will develop halal trends and able to consider certain ways to make new regulations related to halal lifestyle. Thus, information related to halal products is better known in the community.

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The Contribution of Islamic and Conventional Banks to Financial Stability in Indonesia

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Abstract

This study aims to examine an asymmetric relationship between Islamic and conventional bank contributions to financial stability in Indonesia. Adopting non-linear autoregressive distributed lag (NARDL), the study utilizes time-series data from 2004m1-2021m9, consisting of financial stability as a dependent variable, proxied by non-performing loans (NPLs) and ZSCORE. Islamic and conventional banks as independent variables were measured by total financing and total assets. Furthermore, we used interest rates and inflation as complementary variables. The findings reveal that Islamic and conventional banks affect financial stability in the short and long run. However, conventional banks contribute to financial stability more than Islamic banks. The asymmetric relationship explains that an increase/decrease in the independent variables to the same degree does not have the same impact on the dependent variable. This research implies that the financial authorities need to increase their awareness of the presence of asymmetric relationships when designing monetary policy to achieve and maintain financial stability. Finally, the study also fills the current research gap by measuring the contribution of Islamic and conventional banks to financial stability from an asymmetric relationship viewpoint.

Keywords:
Islamic bank; conventional bank; NARDL; financial stability

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INTRODUCTION

In the dual banking system, the financial authorities must adequately manage the market in which Islamic and conventional banks co-exist. Therefore, to implement monetary policies, such authorities, such as the central bank, must ensure that the policies are beneficial to all types of banks (Nair & Anand, 2020). Indeed, a dual banking system exhibits better stability than a single banking one (Nosheen & Rashid, 2021). Financial stability is hence an overriding issue that needs to be achieved and maintained by the financial authorities to ensure the soundness of the financial market (Uddin et al., 2017). In addition, the banking system also makes a significant contribution to financial stability. Financial turmoil at the bank level may negatively impact the banking sector and quickly have an effect on financial systems due to a lack of market discipline and excessive lending (Chapra, 2011; Belouafi et al., 2015). Ijaz et al. (2020) demonstrate that bank stability positively affects economic growth, meaning that banking performance, both for Islamic and conventional banks in dual banking systems, plays a vital role in ensuring financial stability.

In theoretical terms, Crockett (1997) defines financial stability as the way in which financial institutions and the market are able to perform smoothly and create a well-functioning financial market. Financial stability differs from monetary stability, which refers to price stability in all economic sectors free from inflation. Beck (2015) refers to financial stability as an essential condition for a sustainable financial expansion, while according to Crockett (1997), financial and monetary stability reciprocally affect each other. If one of them is unstable, it results in an unstable condition for the other.

From a slightly different perspective, Borio (2011) states that financial stability could be achieved by performing two critical activities: creating prudential regulation for individual financial institutions, and controlling price movement through monetary policies. There is a cumulative conjunction in central banking spheres where simultaneously micro and macro prudential policies aim to safeguard financial system stability, enabling it to efficiently allocate resources to the real economy since the crisis in 2008 (Sinha, 2011).

The financial crisis of 2007-2009 demonstrated that banking stability is imperative for the real economy, as banking institutions stimulate entrepreneurship, economic opportunities, and economic growth (Demirgüç-Kunt & Huizinga, 2010). Consequently, to create financial stability, the players in the financial system are not only intermediary institutions, but also regulatory bodies (Borio, 2011). Therefore, both regulation and management of capital flows are required due to their integral volatility, which can result in a cycle of financial instability for beneficiary economies: a rise in capital flows can lead to the appreciation of a currency; a better balance sheet for debtors; more accessible lending settings; an upsurge in non-tradable amounts; and inclusive inflation, hence making a financial risk of an unexpected condition and aiding local financial instability (Atellu et al., 2021; IMF, 2017).

When the financial system is in an unstable condition, Crockett (1997) concludes that financial institutions and markets are not functioning well and finally create conditions

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for price instability, particularly financial asset prices. Moreover, banking sector instability enhances uncertainty regarding future growth of output (Jokipii & Monnin, 2013). In addition, financial instability worsens the fundamental and financial markets, making real economic activity unstable due to economic shock (Mande et al., 2020). Therefore, such stability a goal that needs to be achieved and maintained to create financial soundness. Consequently, financial stability remains the core agenda for policymakers in all economies (Atellu et al., 2021). Financial institutions, such as those in the banking sector, play a pivotal role in financial stability. Because the banking industry is one of the leading players in the financial market, the banking sector is expected to contribute to financial stability in a positive way.

From the empirical viewpoint, many recent studies have been conducted on the issue of financial stability. Concerning stability at the banking level, Kim et al. (2020) state that banks' diversification in their operations increases banking stability. In addition, in a cross-country study Feghali et al. (2021) argue that credit inclusion has a negative effect on banking performance as well as stability. In a different context, Miah et al. (2020) state that charging higher switching fees in Islamic banks has prompted greater market power, but less financial stability.

An earlier study by Ashraf et al. (2016) demonstrated that shareholder concentration motivates banking stability, with higher ownership concentration tending to lead to more significant insolvency risks. Concerning the comparison between Islamic and conventional banks, Olson & Zoubi (2017) found that Islamic ones had a different level of fragility to their conventional counterparts during the global financial crisis (GFC). Islamic banks were more robust in dealing with systematic risk during the financial crisis than conventional ones. However, post-crisis the convergences between banks have narrowed.

These findings are in line with those of Trad et al. (2017) in the MENA region; Asutay & Othman (2020) in the case of Malaysia; Hassan et al. (2019), Safiullah (2021) and Bilgin et al. (2021), who conducted cross-country analysis; and Louhichi et al. (2019), who observed globally that in the competitive market Islamic banks gave considerably more support to banking stability. Nosheen & Rashid (2021) also found that a single banking system was less stable than a dual one, with the presence of Islamic banks attributing to higher stability in 416 banks in 39 countries. In contrast, Raouf & Ahmed (2022) demonstrated that risk governance for Islamic banks was less, thus harming stability. However, their business models include characteristics that increase stability.

Hassan et al. (2019) explain that better stability and its contribution to financial stability from the Islamic bank side is caused by several factors. First, Islamic banks can utilize money in a well-functioning medium as an exchange rather than in transactions based on a real underlying asset. Second, Islamic banks have different characteristics to conventional ones in terms of product development (Trinh et al., 2020). They are not involved in extended loans, but instead promote real transactions with explicit, fundamental economic activities.

In contrast, in the case of Bangladesh Uddin et al. (2017) found that before, during, and post-crisis, there was no difference between Islamic and conventional bank performance, as they followed almost the same business model. This also confirms that even though Islamic banks are an alternative to the conventional banking business model, they are not free from risk in the financial system. Aysan & Ozturk (2018) state that Islamic banks might not be an appropriate mechanism for eliminating the adverse impact of financial crisis or economic recession.

Trinh et al. (2020) estimated the more robust performance of conventional banks and greater financial stability compared to Islamic banks in 14 countries. Both Islamic and conventional banks were severely affected during the global financial crisis, having the same exposure to systematic risk. This finding is similar to those of Kasri & Azzahra (2020), who used Indonesia as the study object. In the case of Malaysia, Mohamad et al. (2018) explain that conventional banks are more stable than Islamic ones because they Islamic banks have a higher risk of providing financing activities to deficit units. Albaity et al. (2019) also found that Islamic banks in the MENA region were more vulnerable in terms of banking stability.

Kabir et al. (2015) argued that Islamic banks faced higher risk in financing activities for three reasons. First, this was because of the lack of experience of Islamic bankers in identifying financing activity risks, including non-performing financing. Second, the sharia aspect is still considered a burden, preventing banks from operating flexibly and quickly in response to market development. Third, Islamic bank financing still dominantly relies on real estate and construction projects, which need to be diversified, particularly during periods of financial distress.

In general, banking performance affects financial stability. The interconnectedness between banks can weaken the level of stability if a particular bank goes bankrupt (Chen, 2022). Ijaz et al. (2020) explain that less competition supports economic growth and enhances financial stability. Moreover, Rashid et al. (2017) demonstrate that Islamic banks might contribute more to financial stability than conventional ones. This assertion relies on the fact that Islamic banks have more income diversity in financing activities, higher profitability, and a higher investment ratio. All these factors contribute to increased financial stability, as reflected by the value of the stability.

In the case of Saudi Arabia, both Islamic and conventional banks generally contribute to financial stability (Ghassan & Guendouz, 2019). However, Islamic banks tend to be slightly more efficient in strengthening stability as they have more assets and financing diversification. Regarding the East Asian banking sector (Indonesia and Malaysia), Ali et al. (2020) showed an increase in system stability due to the enhanced competition from Islamic banks. A similar finding was obtained by Hassan et al. (2021) in Pakistan's dual banking sector.

In the case of Indonesia, Rizvi et al. (2020) found that Islamic banks contributed to financial stability due to their asset and liability performances. Recent studies on Islamic and conventional banks' contribution to financial stability are dominated by financial

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stability at the banking level (Belouafi et al., 2015). This means that there remains scope to fill the research gap by enriching the current debate on the contribution of the banking sector to financial stability in the dual banking system.

Concerning the importance of the issue of financial stability, this study aims to examine the contribution of Islamic and conventional banks to this with reference to Indonesia. Previous studies have focused on comparing conventional and Islamic bank stability, rather than the contribution of both to the stability of an economy (Bitar et al., 2021; Mateev et al., 2022; Paltrinieri et al., 2021; Safiullah, 2021). Furthermore, the asymmetric influence of Islamic and conventional banks in Indonesia needs to be observed to understand the significance and the direction in which both types of banks contribute to financial stability. There were several reasons for using Indonesia as the object of the study: (1) Indonesia is one of the world's most populous Muslim countries which has a dual banking system (Rizvi et al., 2020); (2) Indonesia had roughly double-digit banking sector growth, particularly in the Islamic sector (Ernst & Young, 2016); (3) the Indonesian banking system is considered to be robust as it is able to address the issue of financial turmoil during times of financial crisis (Khattak et al., 2021).

In relation to previous related studies, the contributions of this study are twofold. First, it considers previous studies in which banking stability was only discussed at the institutional level. Some, such as that of Santosa et al. (2020), explain that Islamic bank stability is affected by macroeconomic conditions. In addition, comparing conventional and Islamic bank stability, Olson & Zoubi (2017), Trad et al. (2017), Asutay & Othman (2020), Hassan et al. (2019), Safiullah (2021), Bilgin et al., (2021) and Louhichi et al., (2019) conclude that Islamic banks are superior in terms of banking stability during financial turmoil and in tight banking competition. However, debate continues concerning the findings of Uddin et al. (2017) and Kasri & Azzahra (2020), who argue that Islamic and conventional banks are the same from the perspective of financial fragility in many economic circumstances. Other studies have obtained different results, such as those of Mohamad et al. (2018) and Albaity et al. (2019), who explain that conventional banks are better off in financial stability while Islamic banks are worse off.

Second, this study also sheds light on the new perspective of the asymmetric influence of Islamic and conventional banks on financial stability in Indonesia. This perspective is believed to be the originality of this study, as other studies, such as those of Chen (2022), Rashid et al. (2017), Ghassan & Guendouz (2019), and Rizvi et al. (2020) did not consider this approach. Although Fakhrunnas et al. (2022) highlight the use of the asymmetric impact on non-performing financing in the Indonesian banking industry, their study only focuses on the impact of macroeconomic factors and does not clearly refer to the contribution of banks to financial stability. Referring to the studies of Bussiere (2012), Gohar et al. (2022) and Elsayed et al. (2022), an increase to a certain degree of the Y variable might have a different impact when the variable experiences a certain level of decrease in another variable. Assuming a

symmetric relationship between the observed variables might create a biased analysis, including in terms of assessment of the determinants of financial stability in the banking system. Therefore, the use of the asymmetric approach is believed to be much more relevant for analyzing the contribution of Islamic and conventional banks to such stability.

The study is believed to be significant in two ways. First, it provides precise information to banking industry stakeholders regarding the asymmetric effect in financing activities and banks' asset size when both variables experience an increase or decrease at a certain level. Second, the financial authorities in Indonesia need to respond and issue policies to address the issue of financial stability when the asymmetric effect of Islamic and conventional banks is evident, with reference to empirical evidence. In addition, the authorities should also assess which type of bank contributes more to financial stability. This assessment could be used to evaluate banking performance from the regulatory body perspective. Finally, after the introduction, the method employed is explained. This is followed by the results and discussion of the findings, and finally the conclusion and recommendations.

METHODS

In measuring the contribution of Islamic and conventional banks to financial stability in Indonesia, this study adopts time-series data retrieved from the Indonesian Financial Service Authority (OJK) from January 2004 to September 2021 and from Indonesian Statistics and the Central Bank of Indonesia. They are the most extended data that can be retrieved from the available resources. The theoretical framework proposed by Crockett (1997) and Borio (2011) is employed, who posit that the presence of financial institutions determines stability in the financial system. The study model is as follows:

$$FS_t = \beta_0 + \beta_1 IBFin_t + \beta_2 IBSIZE_t + \beta_3 CBFin_t + \beta_4 CBSIZE_t + \beta_5 Int_t + \beta_7 Inf_t + \varepsilon_t \quad (1)$$

Where FS stands for financial stability at time t. It is measured based on Hassan et al. (2019), who adopt credit risk to measure financial stability, proxied by non-performing loans (NPL) (Louhichi et al., 2019). Another proxy suggested by Korbi & Bougatef (2016) and Rashid et al. (2017) is ZSCORE. In addition, the independent variables that explain bank financing (IBFin for Islamic banks and CBFin for conventional banks) and size (IBSIZE for Islamic banks and CBSIZE for conventional banks) are used to represent Islamic banks (IBs) and conventional banks (CBs). The complementary variables adopt the interest rate (Int) and inflation (Inf). A definition and interpretation of the observed variables are given in Table 1.

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Table 1. Explanation of the Variables

Variable	Estimation	Interpretation
NPL	The percentage of non-performing loans in the Indonesian banking system (on a monthly basis).	A higher NPL level reflects a lower level of financial stability in the banking system and vice versa.
ZSCORE	The sum of return on assets (ROA) plus equity, both are divided by the standard deviation of ROA	A higher ZSCORE reflects a higher level of financial stability in the banking system and vice versa.
IBFin	The log of the total financing of Islamic banks in Indonesia (on a monthly basis).	A higher IBFin reflects a higher presence of IB in terms of financing activities and vice versa.
IBSIZE	The log of the total assets of Islamic banks in Indonesia (on a monthly basis).	A higher IBSIZE reflects a higher presence of IB in terms of size in the banking system and vice versa.
CBFin	The log of the total financing of conventional banks in Indonesia (on a monthly basis).	A higher CBFin reflects a higher presence of CB in terms of financing activities and vice versa.
CBSIZE	The log of the total assets of conventional banks in Indonesia (on a monthly basis).	A higher CBSIZE reflects a higher presence of CB in terms of size in the banking system and vice versa.
Int	The overnight interest rate of the Central Bank of Indonesia (on a monthly basis).	A higher Int reflects a higher cost of borrowing in the financial market and vice versa.
Inf	The rate of inflation in Indonesia (on a monthly basis).	A higher Inf reflects a greater increase in the price of the goods and services and vice versa.

The non-linear autoregressive distributed lag (NARDL) model was used to examine the presence of asymmetric relationships between the variables, following the proposal of Shin and Greenwood-Nimmo (2014). The NARDL model for the study is as follows:

$$\begin{aligned}\Delta \mathrm{FS}_t = {} & a_0 + a_1\,\Delta \mathrm{FS}_{t-1} + a_2\,\Delta POSIB_{t-1} + a_3\,\Delta NEGIB_{t-1} + a_4\,\Delta POSCB_{t-1} \\ & + a_5\,\Delta NEGCB_{t-1} + a_6\,\Delta \mathrm{Int}_{t-1} + a_7\,\Delta \mathrm{Inf}_{t-1} + \sum_{i=1}^{n} \Theta_{1i}\,\Delta \mathrm{FS}_{t-1} \\ & + \sum_{i=1}^{n} \Theta_{2i}\,\Delta POSIB_{t-1} + \Theta_{3i}\,\Delta NEGIB_{t-1} \\ & + \sum_{i=1}^{n} \Theta_{4i}\,\Delta POSCB_{t-1} + \Theta_{5i}\,\Delta NEGCB_{t-1} \\ & + \sum_{i=1}^{n} \Theta_{6i}\,\Delta \mathrm{Int}_{t-1} + \sum_{i=1}^{n} \Theta_{7i}\,\Delta \mathrm{Inf}_{t-1} + \mu_t \end{aligned} \quad (2)$$

As mentioned above, IB reflects the presence of Islamic banks, while CB reflects that of conventional banks. Therefore, the positive (POS) and negative (NEG) variables in Equation 2 are obtained from:

$$POSIB_t = \sum_{i=1}^{n} \Delta IB_t^+ = \max(IB_t,0) \quad (3)$$

$$NEGIB_t = \sum_{i=1}^{n} \Delta IB_t^- = \max(IB_t, 0) \quad (4)$$

$$POSCB_t = \sum_{i=1}^{n} \Delta CB_t^+ = \max(CB_t,0) \quad (5)$$

$$NEGCB_t = \sum_{i=1}^{n} \Delta CB_t^- = \max(CB_t, 0) \quad (6)$$

In addition, to estimate the NARDL model, the steps taken were similar to autoregressive-distributed lag (ARDL), as also explained by Shin & Greenwood-Nimmo (2014). The first step was to calculate the unit-root test proposed by Dickey & Fuller (1979) and Phillips & Perron (1988) to assess the stationary level. Second, bound testing cointegration was conducted, as suggested by Pesaran et al. (2001), and finally a Wald test was conducted to examine the presence of asymmetric relationships. To check the robustness of the data, Sriyana & Ge (2019) explain that the cumulative sum (CUSUM) then needs to be tested with an alpha level of 0.05 (5%).

RESULT AND DISCUSSIONS

Table 2 gives a description of the variables used in the study. It can be seen that the average NPL in the Indonesian banking system over the observation period is 3.24%, which is considered to be low, even though in July 2006 it reached 8.42%. The average of another financial stability proxy, ZSCORE, is 1434.93; the higher this is, the lower the risk of bankruptcy.

Table 2. Descriptive Statistics

Variable	All Periods				
	Mean	**Med**	**Max**	**Min**	**Std. Dev.**
NPL	3.24%	2.12%	8.42%	1.27%	2.09%
ZSCORE	1434.93	179.1519	142347.5	3.279598	9956.965
IBFin	IDR 117,862	IDR 138,066	IDR 250,698	IDR 5,764	IDR 81,202
IBSIZE	IDR 161,718	IDR 143,746	IDR 429,733	IDR 8,757	IDR 124,404
CBFin	IDR 2,754,945	IDR 2,555,928	IDR 5,553,170	IDR 432,466	IDR 1,738,563
CBSIZE	IDR 4,295,516	IDR 3,924,059	IDR 9,063,823	IDR 1,135,765	IDR 2,432,253
Int	6.79%	6.63%	12.75%	3.50%	2.06%
Inf	5.70%	4.70%	18.38%	1.32%	3.48%

Note: the IBFin, IBSIZE, CBFin and CBSIZE are in billion IDR

In addition, the average level of financing in Islamic banks is IDR 117,862, while for conventional banks this is IDR 2,754,945. The average level of Islamic and conventional bank assets are IDR 161,718 and IDR 4,295,516 respectively. The mean value of bank financing and size indicates that Islamic banks are less developed in terms of the level of financing and size. This is possibly because Islamic banks only emerged

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on the Indonesian banking industry scene in 1992, with the establishment of Bank of Muamalat, whereas conventional banks had already existed for many years. Furthermore, the rate of inflation is lower, at approximately 1%, compared to the interest rate issued by the Central Bank of Indonesia.

To begin the NARDL analysis, augmented Dickey-Fuller (ADF) and Philip-Perron (PP) were applied in the unit-root test to assess the level of stationarity, as proposed by Dickey & Fuller (1979) and Phillips & Perron (1988). Shin & Greenwood-Nimmo (2014) suggest that the level of stationarity in the unit-root test can be of a different order, but no higher than the second order. As shown in Table 3, the level of stationarity for NPF, ZSCORE, and Int are in level, while the others are in first difference. It can hence be concluded that the NARDL model can be applied because of the existence of a stationary level in level and in first difference in the model used.

Table 3. Results of Unit Root Test

Variable	At Level		First Difference		Stationary level
	ADF	PP	ADF	PP	
NPF	-1.66*	-1.67*	-7.46***	-14.89***	In Level
Z-Score	-14.46***	-14.48***	-12.07***	-108.26***	In Level
IBFin	-1.52	-1.68	-13.12***	-13.23***	1st Difference
IBSIZE	-1.83	-1.79	-14.91***	-14.91***	1st Difference
CBFin	-1.52	-1.68	-13.12***	-13.23***	1st Difference
CBSIZE	-1.83	-1.79	-14.91***	-14.91***	1st Difference
Int	-3.92**	-2.85	-6.64***	-6.43***	In Level
Inf	-1.04	-1.38	-6.96***	-11.96***	1st Difference

Note: ***,** and * indicate significance levels of 1%, 5% and 10% respectively.

The NARDL results in the short run are shown in Appendix 1. In the diagnostic test, co-integration exists in the model, reflecting that it has a long-run relationship. In addition, the Wald test also revealed that the model generally has an asymmetric relationship and that each change in the observed variable in the positive or negative direction also has an asymmetric relationship. According to the results, each positive or negative change in the independent variables has no symmetric effect on the financial stability variable.

These findings are in line with those of Elsayed et al. (2022) and Bussiere (2012), who concluded that independent variables might have an asymmetric relationship by referring to the different impacts when there is a change in the increase or decrease of the exogenous variable in relation to endogenous variables. The alignment of the results also confirms the theoretical frameworks of Crockett (1997) and Borio (2011), who posit that the presence of financial institutions such as the bank simultaneously affects financial stability.

Regarding the separate influence of each of the independent variables on the dependent variable, it can be seen that in the short run in Model 1, an additional increase in Islamic bank financing has a positive and significant relationship with a change in NPL, but this is in the opposite direction with regard to the influence of a decrease of Islamic bank financing on NPL after an adjustment process in the longer lag. In addition, the values of IBSIZE_P and IBSIZE_N have a positive relationship with NPL. In contrast, the presence of conventional banks in terms of financing activities has a different influence to that of Islamic banks when there is an increase or decrease in NPL. An increase in the positive and negative values of conventional bank size also has a negative relationship with NPL.

According to the findings, in terms of financing activities, Islamic banks tend to reduce the level of financial stability by contributing to an increase (or decrease) in the rate of NPL in the banking system when financing activities increase (or decrease). On the other hand, conventional banks, either in terms of financing or banking assets, reduce the rate of NPL in the banking system. This finding contradicts those of Rashid et al. (2017) and Rizvi et al. (2020), who found that Islamic banks contributed more to financial stability than conventional ones. In relation to this situation, Islamic banks possibly undertake financing activities that involve less prudent risk management compared to their counterparts, as predicted by Mohamad et al. (2018) and Kasri & Azzahra (2020).

In Model 2, an additional increase (or decrease) in the financing activities of Islamic banks has a negative (or positive) value on ZSCORE. In terms of banking size, the influence is roughly the same as financing activities, even though in the certain lag of adjustment influence in the short run, the effect is in a different direction. For conventional banking, a change in negative or positive financing levels increases or decreases the level of ZSCORE changes respectively. Moreover, both increases and decreases in conventional banking size have a positive relationship with ZSCORE.

The finding explains that the presence of Islamic banks increases the level of bankruptcy risk. It also emphasizes the results of Model 1, in which the presence of conventional banks increases financial stability, but that this not the case for Islamic banks. Therefore, the bank significantly affects financial stability, as described by Chen (2022). However, Ghassan & Guendouz (2019) found that the contribution of both banks to financial stability did not exist in the short run. Albaity et al. (2019) also support this result with their argument that Islamic banks are more vulnerable, particularly in their performance. The rationale for this argument is that Islamic banks are still considered to lack risk management, which leads to more risk exposure in banking operations. On the other hand, as concluded by Mohamad et al. (2018), conventional banks are more stable in their operations, particularly in managing bankruptcy risk, and can consequently contribute to stability of the financial system.

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Table 4. Results of the Long-run Relationship

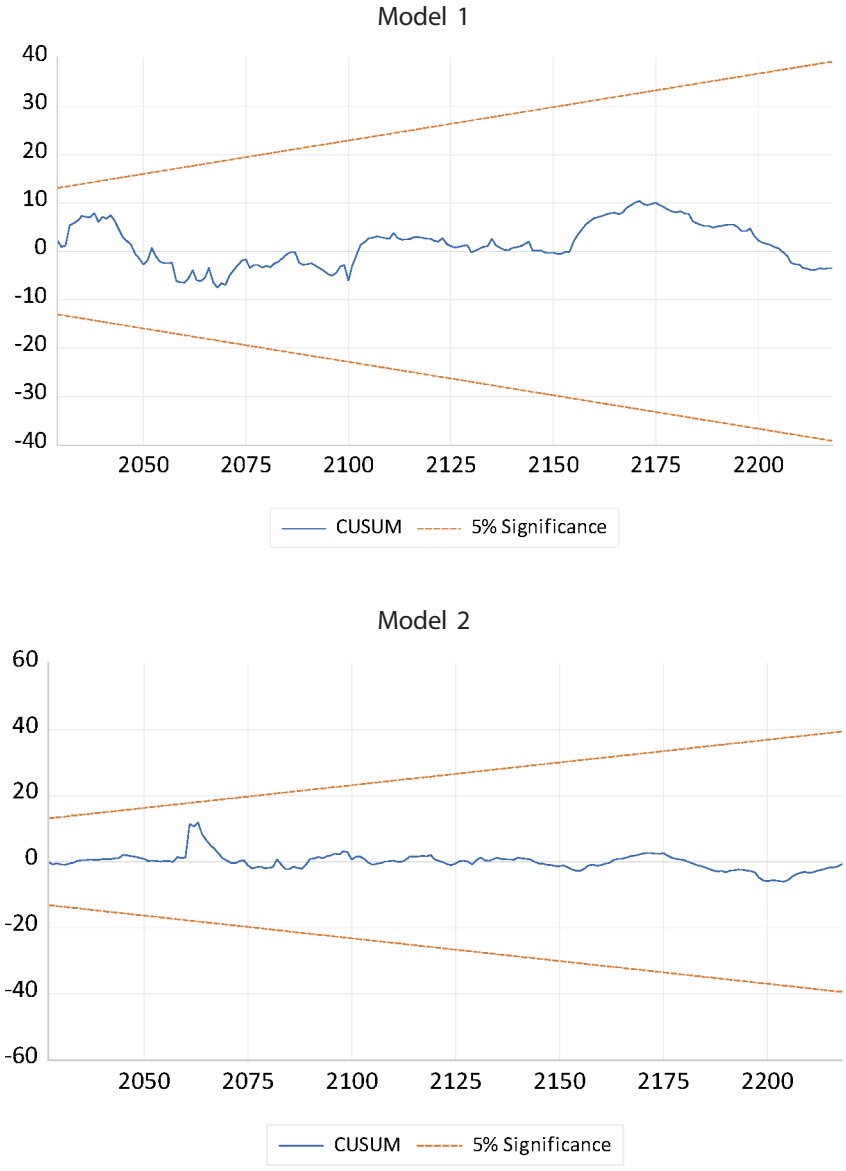
Variable	Model 1		Model 2	
	Coeff	t-Stat	Coeff	t-Stat
C	5.67	10.23***	-9448.71	-0.60
NPL(-1)	-0.39	-10.33***		
ZSCORE(-1)			-1.78	-9.64***
IBFin_P(-1)	-0.48	-0.62	94056.65	3.25***
IBFin_N(-1)	0.50	1.14	-15623.45	-1.11
IBSIZE_P(-1)	-2.50	-3.17***	-180860.50	-5.34***
IBSIZE_N(-1)	-0.72	-1.04	2393.15	0.10
CBFin_P(-1)	-2.98	-3.85***	120194.70	4.32***
CBFin_N(-1)	-2.39	-1.26	-171221.10	-2.98***
CBSIZE_P(-1)	9.05	6.72***	10115.65	0.22
CBSIZE_N(-1)	13.25	4.33***	64850.84	0.75
INT(-1)	-0.09	-2.65**	-595.22	-0.54
INF(-1)	0.07	5.01***	1603.86	3.18***

Note: ***,**,and * indicate levels of significance of 1%, 5% and 10% respectively.

In the long run, only CBFin_P has a negative and significant relationship with change in NPL. Furthermore, when other Islamic bank variables do not have a significant influence in Model 1, an increase in the negative and positive value of change in conventional bank size has a positive relationship with change in NPL. In Model 2, IBFin_P has a positive and significant relationship with change in the ZSCORE value, while an increase in Islamic bank size is in the opposite direction to the dependent variable. Moreover, an increase (or decrease) in conventional bank financing has a significant relationship with an increase (or decrease) in the level of bankruptcy risk.

However, an increase (or decrease) in conventional bank assets does not have a significant influence on the ZSCORE value. Based on this finding, in the long-run relationship, the results are in line with Ghassan & Guendouz (2019), who conclude that both types of banks have contribute to stability in the financial system. The level of stability in banking operations might be the same as that found by Uddin et al. (2017), which ultimately makes the same contribution to financial stability in the long run. This argument relies on the same business model and a banking approach that practices deposit-taking based on the dual banking system, even though the contracts used in funding and financing activities are different.

Figure 1. CUSUM Stability Test



When the number of coefficients is used to measure the impact, the degree of influence is stronger for conventional banks than Islamic ones. In addition, the impacts of conventional banks are generally much stronger on the NPL rate than that of their conventional counterparts. This finding is different from those of Rashid et al. (2017), who demonstrated that Islamic banks contribute much more to financial stability than conventional ones. Moreover, in the long run, the level of fragility of Islamic banks is possibly no better than that of conventional banks. This is discussed by Albaity et al. (2019), who emphasize that Islamic banks need to increase their capacity to generate profit and to address the systematic risk that might appear in the financial system.

The finding also particularly explains that an increase in Islamic bank size reduces any change in the NPL rate in the banking system. Olson & Zoubi (2017), Trad et al. (2017) in relation to the MENA region; Asutay & Othman (2020) in the case of

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Malaysia; Hassan et al. (2019), Safiullah (2021), and Bilgin et al. (2021) argue that the greater stability of Islamic banks might be because if they are larger, this also supports a decrease of the NPL rate in the banking system. Therefore, the contribution of Islamic banks to financial stability, as argued by Rizvi et al. (2020), might be achieved when they are bigger and can finally perform well in income and risk diversification. In this case, as claimed by Hassan et al. (2019), Islamic banks might become well-functioning financial intermediaries with a better quality of financing.

Finally, to check the stability of the data, according to the CUSUM stability test suggested by Sriyana & Ge (2019), it can be seen that the data move within the red lines during the observation period at the level of 5% significance. This result indicates that the data are stable, and that the results of the study can be considered robust.

CONCLUSION

The study aimed to examine the contribution of Islamic and conventional banks to financial stability from the perspective of an asymmetric approach. The study findings reveal that an asymmetric relationship exists regarding how the presence of Islamic and conventional banks affects the financial stability of the Indonesian banking system. Moreover, in the short-run relationship, Islamic banks make a lower contribution to financial stability than their conventional counterparts. However, in the long run, the contribution of Islamic banks is better than in the short run, even though conventional banks continue to have a more substantial influence on financial stability. Referring to the long-run period, Islamic banks still has a high possibility of contributing to financial stability as long as their size can be increased.

Therefore, as a policy implication, it is suggested that the financial authorities should be aware of the emerging asymmetric relationship between Islamic and conventional banks and financial stability. Several policies need to be developed to ensure financial stability and development of the banking industry. This could be achieved by promoting more prudent risk management; encouraging Islamic banks to expand in size, which may need regulation incentives; and finally, by ensuring that all financial policies increase the financial soundness of the banking system. Finally, the authors acknowledge that this study has limitations and room for improvement, particularly in the use of samples. Hence, it is suggested that the future research should increase the sample size by using cross-country analysis to capture the existence of an asymmetric relationship between the presence of Islamic and conventional banks and stability in the financial market.

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Appendix 1. Results of the Short-run Relationship

Variable	Model 1		Model 2	
	Coeff	t-Stat	Coeff	t-Stat
DNPL(-3)	0.18	3.62***		
DNPL(-9)	0.13	2.40**		
DNPL(-10)	0.18	3.34***		
DNPL(-12)	0.28	5.16***		
DZSCORE(-1)			0.53	3.26***
DZSCORE(-2)			0.51	3.57***
DZSCORE(-3)			0.39	3.69***
DZSCORE(-4)			0.12	1.91*
DZSCORE(-12)			-0.12	-2.99***
DIBFin_P	4.72	3.57***		
DIBFin_P(-1)			-91580.09	-1.71*
DIBFin_P(-2)			-116394.70	-2.13**
DIBFin_P(-3)	3.71	2.75**	-91489.19	-1.80*
DIBFin_P(-4)	7.04	5.29***		
DIBFin_P(-5)	2.80	2.17**	-124542.60	-2.51**
DIBFin_P(-6)			-210643.80	-4.15***
DIBFin_N	-1.48	-2.13**		
DIBFin_N(-2)	1.08	1.76*	36615.04	1.62
DIBFin_N(-3)			68685.06	2.96***
DIBFin_N(-5)			62688.37	2.68**
DIBFin_N(-9)	2.51	3.96***		
DIBFin_N(-10)	1.06	1.70*		
DIBFin_N(-11)	1.09	1.71*		
DIBFin_N(-12)	1.33	1.98*		
DIBSIZE_P			-96709.39	-2.70**
DIBSIZE_P(-1)	2.27	2.09**	138648.10	3.10***
DIBSIZE_P(-2)			200329.90	4.39***
DIBSIZE_P(-3)			97961.64	2.08**
DIBSIZE_P(-4)			134122.80	3.45***
DIBSIZE_P(-5)			158348.30	3.81***
DIBSIZE_P(-6)	-3.03	-3.28***	256820.40	5.98***
DIBSIZE_P(-7)	-3.75	-3.58***	83841.75	2.36**
DIBSIZE_P(-8)			103596.50	4.01***
DIBSIZE_P(-9)			145569.80	5.09***
DIBSIZE_P(-11)	3.42	4.84***		
DIBSIZE_P(-12)	1.17	1.58*8		
DIBSIZE_N	7.32	4.39***	104116.00	1.92**
DIBSIZE_N(-1)	3.69	2.24**	-106472.80	-2.31***
DIBSIZE_N(-2)			-132131.00	-2.17**
DIBSIZE_N(-5)			-145216.00	-2.72**
DIBSIZE_N(-7)	7.04	5.90***		

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Variable	Model 1		Model 2	
	Coeff	t-Stat	Coeff	t-Stat
DIBSIZE_N(-8)	5.24	4.28***		
DIBSIZE_N(-9)	4.75	4.70***	81284.84	1.99*
DIBSIZE_N(-11)	-4.59	-4.19***	-77263.48	-2.12**
DIBSIZE_N(-12)	-3.72	-3.24***		
DCBFin_P	-11.62	-5.13***	265371.20	2.85**
DCBFin_P(-1)	-6.43	-2.67**	-195499.30	-2.03**
DCBFin_P(-4)			190643.30	2.05**
DCBFin_P(-8)	-8.91	-3.87***		
DCBFin_P(-9)			-204177.80	-2.63**
DCBFin_P(-10)	-4.08	-1.93*	-272387.10	-2.60**
DCBFin_P(-11)	-6.85	-3.27**		
DCBFin_N(-1)	9.21	1.92*		
DCBFin_N(-2)			-403717.00	-2.34**
DCBFin_N(-3)			570516.60	3.68***
DCBFin_N(-5)	-10.89	-2.73**	312385.50	2.24**
DCBFin_N(-6)	-13.14	-2.84**		
DCBFin_N(-8)	20.45	4.26***		
DCBFin_N(-11)			334416.60	2.02*
DCBSIZE_P			233326.50	2.80**
DCBSIZE_P(-1)			395530.40	4.36***
DCBSIZE_P(-2)	-9.74	-4.59***		
DCBSIZE_P(-3)	-12.48	-6.45***		
DCBSIZE_P(-4)			363502.90	4.07***
DCBSIZE_P(-8)			145243.40	2.35**
DCBSIZE_P(-10)			253815.90	2.90***
DCBSIZE_P(-11)			158638.10	2.45**
DCBSIZE_P(-12)	-4.10	-2.30**		
DCBSIZE_N	-24.76	-5.46***		
DCBSIZE_N(-1)	-29.46	-5.17***		
DCBSIZE_N(-2)	-18.51	-4.46***	523956.10	2.95***
DCBSIZE_N(-3)	-7.53	-1.86*		
DCBSIZE_N(-4)	-11.76	-3.15***		
DCBSIZE_N(-6)	7.18	1.81*		
DCBSIZE_N(-7)	-15.47	-3.99***		
DCBSIZE_N(-8)	-16.92	-3.86***		
DCBSIZE_N(-9)			-501171.40	-3.50***
DCBSIZE_N(-10)	-8.81	-2.55**		
DCBSIZE_N(-12)	21.46	5.14***		
DINT(-2)			-6849.19	-2.09**
DINT(-3)	0.18	1.84*		
DINT(-4)	0.26	2.81**		
DINT(-6)	-0.22	-2.40**		

Variable	Model 1		Model 2	
	Coeff	**t-Stat**	**Coeff**	**t-Stat**
DINT(-7)			9049.64	2.57**
DINT(-8)	-0.19	-2.01*		
DINT(-11)	0.30	3.07***		
DINF	0.03	1.79*		
DINF(-2)			-1143.75	-1.81*
DINF(-8)			-1966.54	-2.99***
DINT(-10)	0.27	2.65**		
DINF(-11)	-0.07	-3.76***	-1820.92	-3.19***
R-squared	0.78		0.83	
Adjusted R-squared	0.68		0.75	
F-statistic	7.29***		10.36***	
Durbin-Watson stat	1.93		1.96	
Cointegration Test	17.13***		13.21***	
F-stat Asymmetric	43.94***		10.66***	
Long-Run Positive Asymmetric	12.11***		19.32***	
Long-Run Negative Asymmetric	6.63***		3.54**	

Note: ***,** and * indicate levels of significance of 1%, 5% and 10% respectively.

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Islamic Personality Model as Psychometric Tool to Assess Creditworthiness of Micro Financing

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Abstract

This study aims to develop an Islamic personality model as a psychometric tool to assess creditworthiness as an alternative predictive character analysis for micro businesses. The method designed to formulate the proposed model coded in R Studio uses two approaches. First, we modify Moslem Religiosity Personality Inventory and then frame a structural model based on Partial Least Square. Subsequently, we use the random forest technique to see the model's accuracy. The result shows a valid and reliable model and performs with 89.47 % accuracy with an Area Under Curve -Receiver Operating Characteristic of 90.06 %. This model implies a solution to strengthen the assessment of the character of creditworthiness of a potential micro-business and helps Islamic Financial Institutions to assess prospective micro-business to determine credit risk and pricing.

Keywords:
micro financing; credit scoring; Islamic personality; creditworthiness

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INTRODUCTION

Microbusinesses play a vital role in the economy (Tambunan, 2019) since it dominates 98.67 % of the market. However, it reflects an unhealthy and growing structure in that micro-business is not rising in class. Improving the capability of micro-sector businesses requires solving two main problems. First, trust from financial institutions due to information asymmetry (Agarwal & Hauswald, 2006; Aggarwal & Yousef, 2000; Becchetti & Ponzo, 2011), namely how to effectively select potential partners who have a level of creditworthiness for willingness to repay (creditworthiness) through the process financing analysis (credit scoring analysis). Second, selecting Islamic financing contracts can reduce high transaction costs (Aggarwal & Yousef, 2000; Obaidullah et al., 2008). Consequently, micro-business is required to undertake a creditworthiness analysis process called credit scoring, which predicts financing risk (Abdou et al., 2016; Safitri et al., 2019; Dubina & Kang, 2019; Gool et al., 2010).

In general, credit scoring provided by Islamic financial institutions is also still traditional. It only relies on historical data, thus preventing access to financing for micro-sector partners, many of whom ultimately need a credit score (Vidal & Barbon, 2019; Dubina & Kang, 2019). Dimensions of character and personality, such as social and religious, become rarely assessed in microfinancing, though Islam highlights the critical role of trust and integrity in each transaction (Rabecca et al., 2018).

Even though the previous research confirmed the importance of credit scoring in Islamic finance (Abdou et al., 2016), the use of psychometric data in credit scoring has the advantage of excellent predictive ability in mitigating credit risk (Rabecca et al., 2018). The definition of personality is the organization of a dynamic psychophysical system within a person that will determine the characteristics of the person's behavior. Previous research showed that psychometrics is helpful in improving credit information (Arráiz et al., 2016). Overall conclusions from numerous industrial and organizational psychology studies concurred that personality traits, intelligence, and honesty/integrity were strongly connected with the skills needed to perform the work (Klinger et al., 2013). Additionally, psychological tests that evaluated these three variables had a larger impact on predicting job performance than interviews, peer reviews, reference checks, biographies, and work experience. Microfinance borrowers are also affected by these findings—personality qualities and intelligence help to identify entrepreneurs who can repay a loan.

The obstacle of this research is the need for theories on measuring personality from the Islamic perspective. Islamic personality and religiosity, and the development of religiosity theory by Glock & Stark and Francis Sahin, which adopts a Christian dimension, received attention from Steven Eric Krauss, who compiled The Muslim Religious Personality Inventory (MRPI) to fill the measurement gap. The MRPI instrument (Krauss, 2005) concludes that Islamic personality and religiosity are the levels of one's awareness of God as understood in the monotheistic Islamic view of life. Moreover, several other researchers also created models and instruments based on Islamic personality that helped develop Islamic personality theory (Mujib, 2017; Mohd et al., 2016; Othman et al., 2014; Mahudin et al., 2016; Francis & Sahin, 2008).

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The essential addition of this research to the available literature is in two ways. First, it focuses on formulating the model as a psychometric tool and testing our hypothesis. This study shows that Islamic personality can affect creditworthiness by employing MRPI (Krauss, 2005) and Islamic personality theory (Mujib, 2017) to build an innovative credit scoring inventory based on Islamic Personality. This approach will be fruitful due to market competition within Islamic financial institutions to speed up the administration process. Understanding Islamic characters and religious personalities will take time and resources. Next is to measure the prediction accuracy of the new psychometric tools. According to our findings, Islamic personality has a significant effect on creditworthiness. Furthermore, the variable of aqidah, ibadah, and attitude has significant effects, direct or indirect, through Islamic personality towards the creditworthiness of micro borrowers.

METHODS

This study used a purposive sample of 115 Muslim respondents who run micro-businesses and have credit histories. Respondents were required to complete questionnaires of 223 initial indicators containing Islamic personality (Krauss et al., 2005; Mujib, 2017). These indicators are subset to three variables: (a) Exogenous variable consists of the Islamic Worldview of 3 variables Aqidah (36 indicators), Worship (27 indicators), and Akhlaq (16 indicators); (b) Intervening Variables consist of Islamic Personalities with three dimensions of Mu'min Personality (16 indicators), Muslim Personality (40 indicators), and Muhsin Personality (79 indicators); (c) Endogenous variables: the creditworthiness of micro-business (9 indicators).

The analysis tools use two main approaches, namely Structural Equation Model – Partial Least Square (SEM-PLS) and Random Forest. Conducting Principal Component Analysis (PCA) as a parameter of validity (Ghazali et al., 2020) carried out the validity test. PCA is used to reduce the number of indicators generated from research instruments. Moreover, the question indicators in the research, which are the adoption of previous research, are quite a lot, 223 questions. PCA can synthesize information by minimizing the loss of information from the original data (Karamizadeh, 2013). This method has been widely used on data with large volumes and dimensions in the scope of machine learning (Barshan et al., 2011; Caggiano et al., 2018; Chahboun & Maaroufi, 2021).

PCA analysis was carried out using the R programming language using the 'psych' package (Revelle. W, 2021). The goal is to produce a principal component with a particular variation that synthesizes variables through the varimax rotation approach. Question items that do not meet the component loading requirements will be excluded. The limit value used is the component loading of 0.60 (Tabachnick & Fidell, 2007). There are two preliminary tests so that PCA can be carried out, namely: (1) Kaiser-Meyer-Oklin of Sampling Adequacy (KMO-MSA) with a minimum score limit of 0.50; and (2) Bartlett's test with a p-value criterion of more than the alpha error degree (Huang et al., 2020). The parameters to test the reliability used Cronbach Alpha for each research variable with a minimum limit of 0.60 (Sekaran, 2003).

This research also proposes supervised machine learning (ML) based classification modeling for predicting the result. This approach can measure how well the level of accuracy of the model in predicting and classifying. The dependent variable or target, creditworthiness, is factored into two classes. Classification of endogenous variables is the sum of respondents' answers to questions on creditworthiness indicators/variables that have been previously reduced using Principal Component Analysis. If the sum of the answer values is greater than or equal to 20 (the sum of five answers with a minimum response of 4) then it is categorized as 'likely to pay' (given code = 1). While the sum of answers that are less than 20 is categorized as 'unlikely to pay (given code = 0).

This study uses several parameters to evaluate the model for testing the accuracy of predictions and classification, namely the level of accuracy (accuracy), precision (precision), sensitivity (sensitivity), specificity (specificity), and Area Under Curve (AUC). First, accuracy measures the model's accuracy in predicting the whole ('1'/'0'). Second, precision measures the model's accuracy in identifying the class '1', which is actually '1'. Third, sensitivity or true positive rate measures all '1' in the sample, what proportion does the model suspect is '1'. Fourth, the specificity or true negative rate measures all '0' in the sample, what proportion does the model suspect is '0'. Fifth, the ROC curve contains the ratio between the false positive rate (1-specificity) and the true positive rate. AUC value below 0.50 indicates the model cannot distinguish between '1' and '0'. The model with 100% (perfect) prediction accuracy has an AUC of 1.00. The level of importance of the independent variable (variable of importance) is also presented to find out which of the many independent variables has the highest importance in the model.

RESULT AND DISCUSSIONS

Table 1. KMO-MSA, Bartlett, and Reliability Test

Indicator/Variable	No. of Question	KMO MSA	Bartlett Test *pvalue*	*Cronbach Alpha*
Tauhid Rububbiyah (TR)	5	0,81	0,00	0,92
Tauhid Uluhiyah (TU)	5	0,74	0,00	0,87
Tauhid Asma Washifat (TA)	5	0,78	0,00	0,80
Believe to Allah (IA)	3	0,69	0,00	0,79
Believe in Angels (IM)	3	0,48	0,00	0,50
Believe in Holy Scriptures (IQ)	6	0,84	0,00	0,82
Believe in Messenger (IR)	3	0,71	0,00	0,85
Believe in Judgment Day (IH)	3	0,65	0,00	0,69
Beileve in Qodho & Qodar (IO)	3	0,62	0,00	0,72
Ibadah/Worship (IB)	27	0,90	0,00	0,94
Personal Attitude/moral (AP)	6	0,59	0,00	0,49
Social Behaviour (AS)	10	0,76	0,00	0,76
Mu'min Personality (KI)	16	0,88	0,00	0,91
Muslim Personality (KU)	40	0,86	0,00	0,94
Muhsin Personality (KM)	79	0,79	0,00	0,96
Creditworthiness (Dependent)	9	0,73	0,00	0,74

Source: Research finding

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Table 1 shows that almost all indicators/variables have met the criteria for parameters, except for IM and AP indicators/variables. This result is presumably because several questions need to be more significant. This condition can be overcome using the PCA method, which issues questions with a low component loading value. After excluding indicators with low component loading (Appendix 1), the PCA analysis was carried out again, and the results are presented in Table 5. The number of questions was reduced from 223 to 136. These results increased the Cronbach Alpha reliability value, especially for indicators/variables that did not meet the reliability requirements at first. The reliability of the IM indicator/variable increased from 0.50 to 0.60, and the AP increased from 0.49 to 0.71. Thus, all indicators/variables have met the reliability requirements.

Table 2. PCA Analysis Outcome

Indicator/Variabel	*Component Loading Range*	Varians proportion	Sig.
Tauhid Rububbiyah (TR)	0,80-0,91	76%	0,00
Tauhid Uluhiyah (TU)	0,67-0,91	67%	0,00
Tauhid Asma Washifat (TA)	0,77-0,86	65%	0,00
Believe to Allah (IA)	0,80-0,86	70%	0,00
Believe in Angels (IM)	0,84	71%	0,00
Believe in Holy Scriptures (IQ)	0,60-0,81	53%	0,00
Believe in Messenger (IR)	0,85-0,89	76%	0,00
Believe in Judgment Day (IH)	0,70-0,85	62%	0,00
Beileve in Qodho & Qodar (IO)	0,74-0,87	64%	0,00
Ibadah/Worship (IB)	0,61-0,83	50%	0,00
Personal Attitude (AP)	0,88	78%	0,00
Social Behaviour (AS)	0,63-0,82	51%	0,00
Mu'min Personality (KI)	0,60-0,81	54%	0,00
Muslim Personality (KU)	0,63-0,76	50%	0,00
Muhsin Personality (KM)	0,60-0,82	47%	0,00
Creditworthiness (Dependent)	0,66-0,83	58%	0,00

Source: Research finding

From Table 2 can also be seen that all questions have a range of component loading values that meet the requirements (more than 0.60). The variance proportion value explains how much variation the question component has successfully explained to the indicator. The value of the smallest component proportion is the KM indicator/variable at 47%. This condition happens because of the many questions on the indicator/variable, so forming one component produces relatively low variation. However, the formation of one component on all indicators/variables has been deemed sufficient and significant.

Table 3. First Stage Measurement Evaluation Model

Latent Variable	Indicator number	Value Range of *Loadings*	CA	ρ
Aqidah	34	0,19-0,64	0,96	0,89
Worship	18	0,41-0,72	0,94	0,89
Moral	9	0,49-0,66	0,86	0,81
Personality	70	0,43-0,65	0,98	0,97
Creditworthiness	5	0,58-0,69	0,81	0,77

Source: Research finding

There are three main parameters in evaluating the measurement model internal consistency, convergent validity, and discriminant validity. Indicators that have a loadings value of less than 0.50 will exclude from the model. From 223 question indicators after evaluating the measurement model using Principal Component Analysis, 136 indicators were obtained shows in Table 3. From a total of 136 indicators, there are still indicators in the latent variable that do not meet the requirements for a minimum loadings value of 0.50. These indicators are found in all latent variables, except creditworthiness.

The second and third criteria in evaluating the measurement model are testing convergent validity and discriminant validity. Average variance extracted (AVE) threshold of 0.50 can be used to evaluate convergent validity. Contrary to this, discriminant validity can be assessed by evaluating the cross-loading parameter. Indicators with discriminant validity are those with a high correlation between indicators of the same latent and indicators with low or no correlation between indicators of different latent (Henseler et al., 2015). In this process, 58 indicators were excluded because they did not meet the requirements, especially discriminant validity so the remaining 78 indicators formed the SEM-PLS model.

Table 4 Evaluation of Convergent Validity

Latent Variable	AVE
Aqidah	0,41
Worship	0,51
Moral	0,53
Personality	0,49
Creditworthiness	0,47

Source: Research finding

Based on Table 4 and the remaining 78 indicators, the AVE value for each latent variable is obtained. Several variables have an AVE value of less than 0.5, namely Aqidah, Personality, and Collectability variables. However, it is still acceptable when the composite reliability (ρ) value is more than 0.60 (Fornell & Larcker, 1981; Lam & Maguaire, 2012).

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Based on Table 5, the value for all variables is more than 0.60 so it is still acceptable. After being tested again, the results of the discriminant validity matrix (attachment) gave good results, namely, all correlations in one variable were given the highest value when compared to correlations to other variables. All evaluation indicators of the measurement model, namely internal consistency, convergent validity, and discriminant validity, have given good results and meet the requirements. The structural model was evaluated with a confidence interval as the hypothesis was developed, as shown in Figure 1.

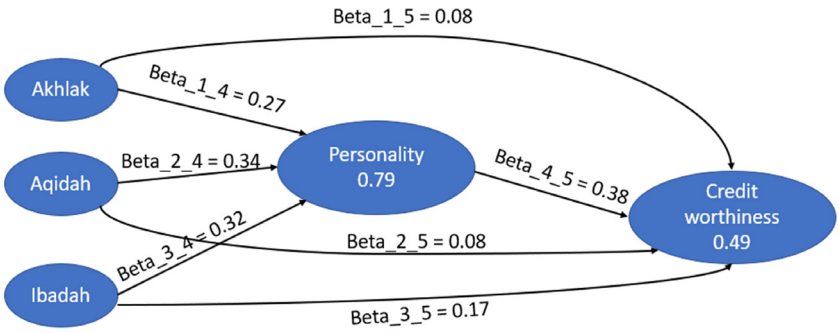
Table 5. Final Stage Measurement Evaluation Model

Latent Variable	Number of Indicators	Interval Loadings Value	CA	ρ
Aqidah	10	0,57-0,65	0,91	0,87
Worship	11	0,53-0,71	0,92	0,87
Moral	8	0,53-0,66	0,84	0,80
Personality	44	0,51-0,64	0,97	0,95
Creditworthiness	5	0,59-0,69	0,81	0,77

Source: Data, 2021

Quite interesting results were obtained from the overall hypothesis testing based on the existing samples. Figure 1 is the inner model of structural SEM-PLS. Between each of the pillars, Aqidah and Akhlak/morals do not directly influence creditworthiness as a variable. At the same time, ibadah has a direct influence on creditworthiness. However, when measured through the personality variable, the three pillars provide a significant and one-way relationship to creditworthiness. Thus, the measurement of collectability through Islamic personality influenced by the three pillars of Aqidah, ibadah, and Akhlak/morals gives the results of a significant relationship to collectability.

Figure 1. SEM Structural Model



Source: Research finding

A structural relationship is significant if there is no 0 value between the lower and upper percentiles (Gudergan et.al, 2008). As shown in Table 6, the structural model

in figure 1 was tested directly (directly), indirectly (indirectly), and overall (total). After knowing the significance of the relationship between latent variables, the next step is to evaluate the structural model with parameter R^2. There are several references in determining how good this R^2 value is. Based on the processing results, the R2 value for the Personality variable was 0.79 or 79%. Meanwhile, the value of R^2 for the collectability variable was 0.49 or 49%. 'Strong' and 'medium' are the two categories of values (Chin, 2010). The research model also shows that 79% of the factors influencing Islamic Personality are related to Aqidah, Worship, and Attitude. Aqidah, Worship, Attitude, and Personality explain 49% of creditworthiness factors.

Table 6. Path Coefficient of Variable *Direct*, *Indirect*, and *Total Effect*

Variable Relations	*Direct Effect*	*Indirect Effect*	*Total Effect*
Personality → Creditworthiness	0,38	-	0,38
Aqidah → Creditworthiness	0,08	0,13	0,21
Worship → Creditworthiness	0,17	0,13	0,30
Akhlak → Creditworthiness	0,08	0,10	0,18

Source: Research finding

There are several other criteria to consider besides the path coefficient and R^2 value, especially when assessing the suitability of the resulting model. The parameters used in this study are the standardized root mean square residual (SRMR) and Stone-Geisser (Q2) (Garson, 2016). From table 7, in general, all model fit criteria give good results. The SRMR value of 0.064 is still below the 0.080 thresholds. Consequently, the value model fits the data since there is not much difference between the actual value and the value in the model. For Variable Personality and Creditworthiness variables, Q2 is 0.44 and 0.39, which are close to the R2 value for Collectability and greater than 0. This value also indicates the model is relevant and fits the data. Using the SEM-PLS approach above, we conclude that Aqidah, Worship, and Attitude have a significant impact on creditworthiness through the Personality variable. Subsequently, predicting creditworthiness requires this information.

Table 7. The Evaluation Result of Model SEM PLS

Variable	R^2	SRMR	Q^2
Aqidah	-		-
Worshio	-		-
Attitude	-	0,064	-
Personality	0,79		0,44
Creditworthiness	0,49		0,39

Source: Research finding

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One of the most important things in building a predictive model using ML such as RF is the need for a class balance. The class imbalance will greatly affect the value and accuracy of the model (Luque et.al, 2019). From 115 samples, the dependent variable creditworthiness as a proportion of likely to pay ('1') of 61.7%, while unlikely to pay ('0') is 38.3%. Although it does not have a perfect class balance, it is still acceptable because it is still classified as a slight imbalance or a ratio higher than 1:4 (Krawczyk, 2016).

Figure 2. Number of Tree and Out of Bag

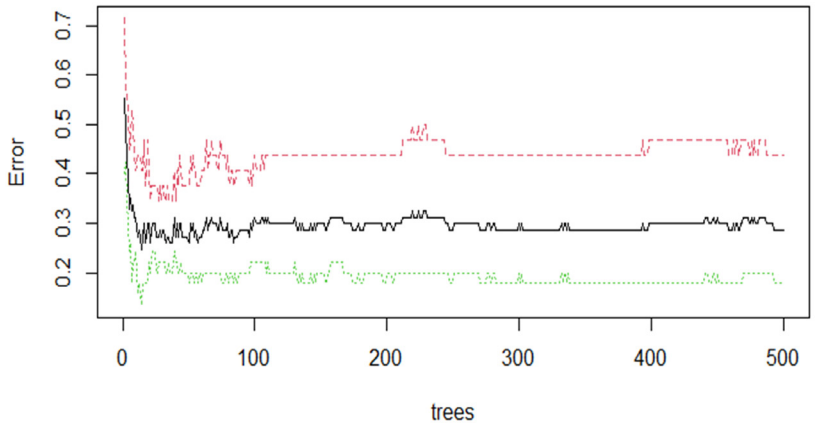

Figure 2 shows that by default the RF model provide OOB, which tends to be stable. The RF model is built on a training dataset of 77 samples with the default setting, which is 500 classification trees with the number of randomized indicators in each split of 11 indicators (which is rounded off from the square root of the number of samples). This modeling results in a stable out-of-bag (OOB) error of 31.17%. The RF model is then tuned to find the optimal split value so that it can reduce the OOB value. The split value (mtry) is obtained by 10 after the tuning process. Then, the RF model was rebuilt with 500 classification trees and produced a new model with the OOB value down to 28.57%. Although not very good, this value is still acceptable considering a large number of independent variables and the sample size is not too large.

Testing the level of prediction accuracy of the RF model is carried out based on testing data containing 38 samples. Using these data, the model is tested and the performance results are presented in Table 8. It shows that: First, the level of accuracy of the model in predicting creditworthiness is 89.47%. This accuracy is obtained from (True Positive + True Negative) / (number of positive samples + number of negative samples). (11 + 23) / 38 x 100 % = 89.47 %. Second, this model has a precision level of 78.57% (Precision = True Positive / (True Positive + False Positive) or 11 / (11+3) = 78.57 %. Third, sensitivity of 91.67% means that this model is 91.67% and often succeeds in predicting a sample with a value of 1, so in its original condition it is indeed 1. TPR is calculated by TP/(TP+FN) or 11 / (11+1) = 91, 67 %. Fourth, a specificity

of 88.46% indicates that this model often predicts that 88.46% of a sample has a value of 0, so in its original condition it is indeed 0. This TNR is measured by TN/TN + FP, or 23 / (23+3) = 88.46 %.

Table 8. RF Accuracy in Predicting Creditworthiness

Prediction Model	Accuracy (%)	Precision (%)	Sensitivity (%)	Specificity (%)	AUC-ROC (%)
Random Forest	89,47	78,57	91,67	88,46	90,06

Source: Research finding

The RF Model can make predictions quite well based on the testing dataset. Based on the Confusion Matrix in Figure 3 above, the model's accuracy in predicting collectability/creditworthiness is 89.47%. In quadrants 1 and 11, unlikely-to-pay borrowers are correctly classified as unlikely-to-pay borrowers. While in quadrant 2, there is one likely-to-pay borrower incorrectly classified as unlikely to pay borrowers. In quadrant 3, three unlikely-to-pay borrowers are incorrectly classified as likely-to-pay borrowers. Similarly, in quadrant 4, 23 likely-to-pay borrowers are correctly classified as likely-to-pay borrowers.

Figure 3. Confusion Matrix Model RF

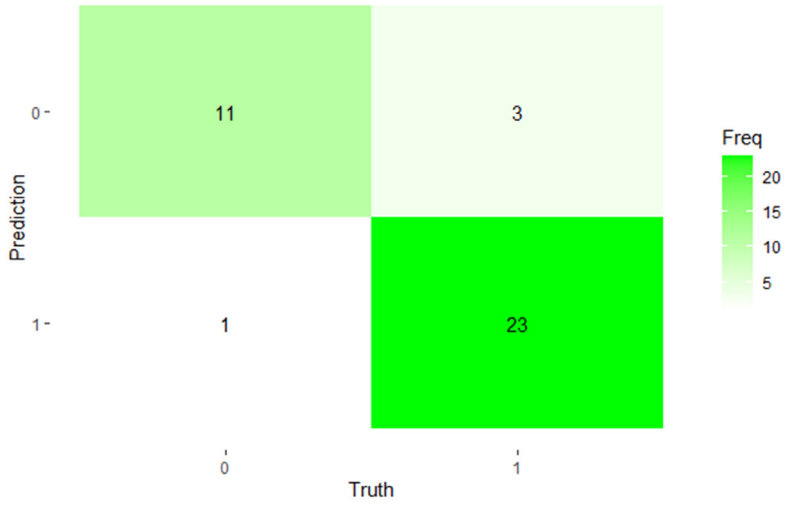

Figure 4 show ROC (Receiver Operating Characteristic) curve, contains a comparison between the false positive rate (1-specificity) and the true positive rate, which can be calculate as follows:

False Positive Rate (FPR) = False Positive / (False Positive + True Negative) = 11.53%

True Positive Rate (TPR) = True Positive / (True Positive + False Negative) = 91.67 %

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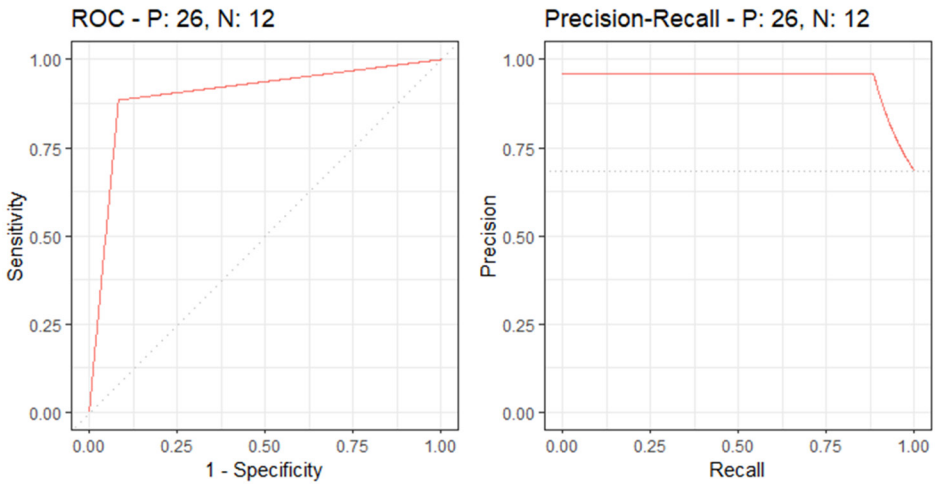
Figure 4. ROC Curve for RF Model



Compared to actual data, the model can predict with precision the 'likely to pay' class of 78.57% and the 'unlikely to pay' class of 91.6%. The AUC (Area Under Curve) value as shown in Figure 4 (Receiver Operating Characteristic model) of 90.06% indicates that the RF model has a good ability to predict creditworthiness, which is shown by the ROC curve approaching the point (0.1) An AUC value below 0.50 indicates the model cannot distinguish between '1' and '0'. The model with 100% (perfect) prediction accuracy has an AUC of 1.00. From the ROC curve and AUC values above, it can be concluded that the performance of the Random forest algorithm for the Islamic personality-based credit scoring model can predict all test data perfectly.

CONCLUSION

Based on testing with the SEM-PLS approach, it can be concluded that all religiosity factors, such as aqidah, ibadah/Worship, and akhlak/morals, significantly affect the level of creditworthiness through the mediating variable Islamic Personality. Partially, the aqidah variable has no significant direct effect on creditworthiness because it only gets a direct effect coefficient value of 0.08 with a percentile range of -0.04-0.21. However, the Aqidah variable indirectly affects creditworthiness through personality aspects with an indirect coefficient value of 0.13 and a percentile range of 0.08-0.16. The direct relationship between Aqidah and creditworthiness in the previous hypothesis is not significant. Thus, the Personality variable is a fully mediating variable in the relationship between Aqidah and creditworthiness (personality variable as full mediation).

The worship variable has a positive effect both directly and indirectly on the creditworthiness of micro business partners, worship directly obtains a direct coefficient value of 0.17 with a percentile of 0.06-0.31, while an indirect coefficient value of 0.13 and a percentile range of 0.08 - 0.16. This result explains that the more disciplined and orderly a person's Worship in terms of time, procedures that meet legal and harmonious requirements, and specialty, the better the level of creditworthiness, where the variable Islamic personality is Part Mediation. Meanwhile, the morality variable has no significant

direct effect on creditworthiness, because it only gets a direct effect coefficient value of 0.08 with a percentile range of -0.04-0.20. However, the Aqidah variable has an indirect effect on creditworthiness through personality aspects. The indirect effect coefficient value is 0.10 with a percentile range of 0.06-0.12. The direct relationship between morals and creditworthiness in the previous hypothesis is insignificant. Thus, the personality variable acts as a total mediating variable in the relationship between morals and creditworthiness, whereas the personality variable acts as full Mediation.

Meanwhile, the Islamic Personality factor significantly affects the creditworthiness level of potential partners with a direct effect coefficient of 0.38 and a percentile value range of 0.25-0.48. The most dominant dimension in this personality model is the Conscientiousness (C) dimension, which means that potential partners tend to be individual characters who tend to be more careful and orderly in acting or considerate in making a decision. Positive characteristics on the dimension are reliable, perfectionist, wise, diligent, responsible, and achievement-oriented. Have high self-discipline and can be trusted.

In terms of predictability, based on dataset testing, Islamic personality-based credit scoring capital processed with Random Forest Machine Learning can be used to make predictions quite well, with a model accuracy rate in predicting collectability of 89.47%. The credit scoring model can predict the 'likely to pay' class of 78.57% and the 'unlikely to pay' class of 91.6%. The AUC value, as in the ROC model, is 90.06% indicating that the Random Forest model performs well in predicting creditworthiness. Consequently, this Islamic personality-based credit scoring model holistically shows a strong foundation in developing the quality of the Know Your Customer (KYC) process in Islamic Financial Institutions (IFI), through their involvement in this process and focus on meeting the needs and desires of their customers, especially micro sector financing. In essence, IFI must have a deep understanding of potential financing partners one by one and should not be generalized. IFI must be able to provide financing "to the right person with the right risk and price" so that the pricing of micro business can be distinguished according to the risk of his personality.

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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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