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PREFACE

This research paper collection is the edited versions of the supervised theses of the undergraduates of the Department of Accountancy and Finance. Nearly 130 theses are supervised by the academics of the Department annually, and six outstanding papers were selected for the current volume. Therefore, all the papers in this volume are jointly authored by the final-year students and their respective supervisors in the Department. What primarily motivated me to initiate this edited research series was to foster a research culture among the academics and students of the Department. Secondly, disseminating intellectual knowledge to a broad spectrum of audiences contributes to the advancement of the body of knowledge in the field. The premise of all papers included in the volume is in the discipline of finance, which covers the Capital Market, Banking Sector, and Insurance Sectors.

All the papers in this volume address timely, important, and academically relevant research issues. So that readers will be well-equipped with objectively addressed and scientifically supported conclusions. As such, I believe this collection will immensely benefit the corporate sector and government policymakers. Moreover, this will be useful to students, teachers, researchers, and other public-spirited citizens interested in this subject. Additionally, I witnessed the extent of work done by all the academic authors in bringing undergraduate theses up to the standards demanded by academia. I congratulate all the academics for encouraging the students to contribute papers to this publication.

As the initiator of this idea, I first compiled the concept paper for the Faculty Board and the University Senate. The comments given by the members of both bodies to further shape the idea are highly appreciated. Very importantly, I would like to express my appreciation to all the academic members of the Department of Accountancy and Finance for encouraging me to pursue my innovative idea and for providing their full cooperation in bringing it to reality. My Co-authors' intellectual and expert contributions are also commendable. Finally, I also appreciate the efforts of the editorial assistants and the copy editor of this edited book.

D.A.I. Dayaratne, PhD
Senior Professor in Finance
Editor-in-Chief

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CHAPTER ONE

Effect of Exchange Rate Structural Breaks on Stock Market Volatility During Economic Downturn Period in Sri Lanka

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Abstract

Recently, stock market volatility has heightened in Sri Lanka due to low investor confidence stemming from unfavourable macroeconomic uncertainties and structural breaks (SBs) in both the currency and stock markets (SMs). SBs in currency markets can create SBs in stock markets, which in turn can lead to a vicious cycle. However, such a scenario is hardly confirmed in the empirical literature. Therefore, this study investigates the causal nexus between the exchange rate (EXR) and stock market volatility (SMV) during Sri Lanka's economic downturn. In this regard, daily EXR and ASPI data were collected from 2010 to 2023. The Bai-Perron test was used to identify SBs, and the ARMA(p,q)-EGARCH(1,1) model was employed to examine the effects of structural breaks on the volatility of EXR and ASPI. The DVECH-MGARCH model was considered in examining the causal nexus between EXR and SMV. At the same time, a real-incident analysis was conducted to identify the causal nexus between EXR and SMV structural breaks. Findings revealed that past shocks positively and significantly influence present volatilities of SM and EXR. SBs negatively affect the volatilities of both markets. Moreover, analysis of real incidents confirmed the existence of a significant dynamic, bidirectional relationship between EXR structural breaks and SMV structural breaks. Thus, policymakers need to recognise that shocks originating in the foreign exchange market can rapidly be transmitted to the stock market, and vice versa, creating a self-reinforcing cycle of instability. This highlights the need for coordinated macro-financial policy responses, rather than treating currency and equity market disturbances in isolation.

Keywords: *Economic downturn, Exchange rate, GARCH models, Stock market, Structural breaks.*

1. Introduction

The current globalised world has a high level of interdependency among countries, resulting in a highly integrated, universal financial sector. The global financial markets are mainly navigated by foreign exchange and stock markets. As a result of globalisation, Sri Lanka has experienced continuous expansion of international trade since the 1970s. In 1973, with the introduction of the free-float exchange rate, EXR volatility and risk increased. Moreover, thereby, businesses also incur losses, which indicates a potential impact on stock market volatility (Yang & Doong, 2004). The Sri Lankan stock market experienced significant development and performance over the past ten years, serving as a platform for firms to raise capital (Aydemir & Demirhan, 2009). According to Madurapperuma (2022), the stock market is considered a reliable sign of the trade cycle and the economy, as business cycles can be predicted through key economic indicators.

The Sri Lankan economy grew rapidly from 2010 to 2015 after the 3-decade domestic war concluded in 2009. After ending the civil war, instead of attempting to expand foreign trade, Sri Lanka decided to concentrate on the local market. Consequently, the charge of importing has risen rather than export revenue. With that continuous decision, Sri Lanka ran out of foreign currency at the end of 2019, as import expenses were $3 billion higher than annual exports (Perera, 2023). Moreover, after the end of the Thirty Years' War, government investment programs and infrastructure development led to an economic expansion of more than 8% per year for 3 consecutive years. Nevertheless, growth was constrained by an unstable foreign current account imbalance, macroeconomic instability, and internal and external shocks, including climate change, the Easter Bomb attack, and constitutional issues (Weerasinghe, 2024). As a result, Sri Lanka faced its worst economic crisis since 2022, which led to foreign exchange rate volatility, high inflation, and interest rate fluctuations, while most other countries were recovering from the COVID-19 pandemic. In 2022, amid the effects of the pandemic, Sri Lanka’s foreign exchange reserves were weakened by limited foreign cash inflows and anticipated debt repayments. This has led to major import restrictions and shortages of necessities such as food, medicine, fuel, and electricity in 2022. During the year, the Sri Lankan Rupee has depreciated by 80%, resulting in a sharp increase in inflation to 73.7%. Moreover, interest rates increased significantly in March 2022 (Colombo Stock Exchange, 2022).

After post-election political stability, which lasted until the end of February in 2020, the exchange rate remained stable at around Rs. 181. Moreover, the exchange rate has been under significant pressure since mid-March 2020, reaching nearly Rs. 200 in April 2020. In March and April 2020, the financial market remained unstable due to the lower remittances,

volatility in the US Dollar Sri Lankan Rupees EXR, ASPI, and market intervention (CBSL, 2021). While there were daily fluctuations in the USD/LKR exchange rate, the EXR has gradually stabilised following the implementation of a more flexible EXR determination by March 2022. The CBSL expected the EXR to settle at Rs. 230 when it was floated in March 2022. However, after CBSL removed the float and pegged the exchange rate, the exchange rate was around Rs. 360 and rose rapidly to Rs. 365 within two months. However, the USD/LKR exchange rate fell by 44.8% over the last 10 months ending in October 2022 (Central Bank of Sri Lanka, 2022). The year's extreme economic volatility significantly increased stock market volatility, as it weakened the trust of investors and other stakeholders (Colombo Stock Exchange, 2022).

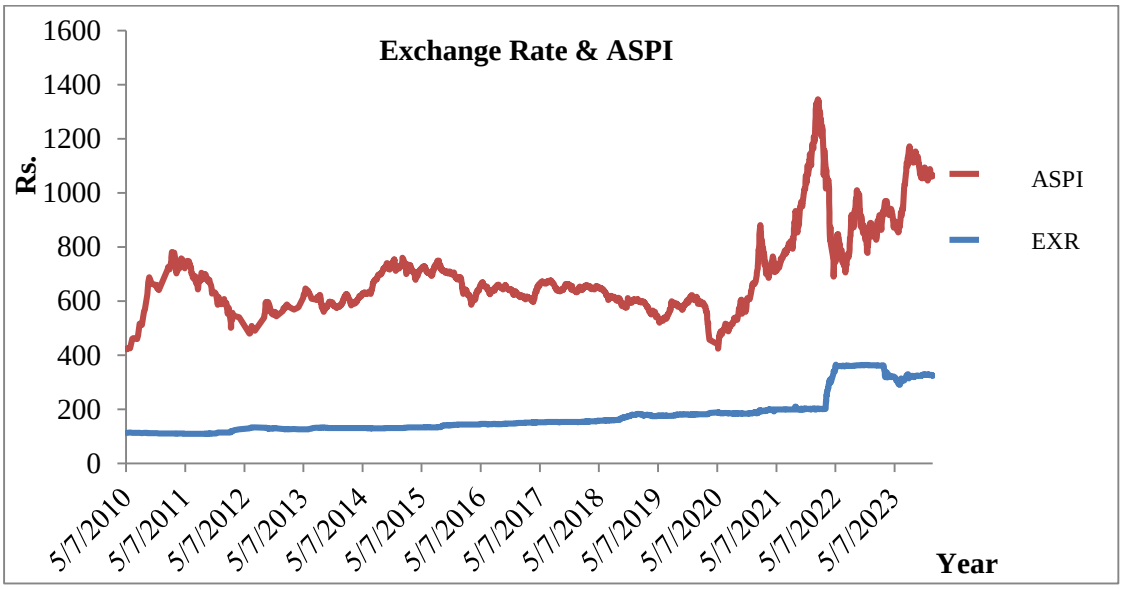


Figure 1.1: Exchange Rate and ASPI Fluctuations

Source: Colombo Stock Exchange (2022) and Central Bank of Sri Lanka (2022)

In Figure 1.1, which shows the fluctuations of EXR & ASPI over a long period in the first quarter of 2022, ASPI began to decline steadily before the sharp depreciation of EXR, driven by policy uncertainties and significant adverse impacts on the local economy. Therefore, it is unable to determine whether a structural break in the EXR led to a structural break in the stock market volatility or vice versa. Accordingly, that situation served as motivation and the background for this study, which explores whether there is a causal nexus between EXR fluctuations and stock market volatility. Hence, it would be appropriate to investigate the effect of EXR fluctuations on SMV by considering the structural break periods during Sri Lanka's economic downturn.

In particular, exchange rate fluctuations will significantly affect the firm's foreign exchange transactions and the company's value. Consequently, the overall performance of the country's

stock market will be significantly affected (Diftar, 2023). Since 2022 was a challenging year for Sri Lanka, marked by significant economic constraints, the stock market's performance has also been significantly limited by the economic crisis. Market volatility has been heightened by low investor confidence stemming from unfavourable global and domestic macroeconomic uncertainties. The level of investor confidence in the market is also highly influenced by economic performance, as it has a considerable impact on SMV (Colombo Stock Exchange, 2022). Sandamini et al. (2021) stated that investors closely monitor stock price and exchange rate movements to maximise their investment gains.

Further, Madurapperuma (2022) emphasised that economic downturns, such as exchange rate fluctuations, adversely affect investors' sentiments when making decisions to invest in Sri Lanka's stock market. According to Karavias (2022), structural breaks occur in response to changes in economic events, such as financial crises. Moreover, several empirical studies (Balke & Fomby, 1997; Atkinson et al., 1997) revealed that structural breaks occur due to shifts in infrequent economic events, and Clements and Hendry (2006) revealed that it is unable to forecast macroeconomic conditions when structural changes exist, which significantly impacts economic relationships. The existence of structural breaks in both the currency and stock markets lowers rational investors' confidence, as they are unable to predict future economic fluctuations. Therefore, during Sri Lanka's economic downturn, how fluctuations in EXR influenced SMV, and whether structural breaks in SMV existed and had an impact, are researchable problems.

Accordingly, research on the effects of structural breaks in EXR and the SMV across different structural-break periods during economic downturns in Sri Lanka remains unexplored. Further, this study's findings will help enhance policies in Sri Lanka's currency market and inform investment decisions. Hence, the research issue of the present study is to investigate whether structural breaks in the exchange rate have a significant effect on the SMV during the economic downturn in the Sri Lankan context.

2. Literature Review

This section presents theoretical and practical literature reviews on the exchange rates and stock market performance during Sri Lanka's economic downturn. First, it will describe the academic background using the Flow-oriented Approach (FOA), Portfolio Balance Approach (PBA), Arbitrage Pricing Theory (APT), and Traditional Economic Theory. Second, it will outline the findings of previous empirical studies relating to exchange rate and stock market performance, the dependent variable (stock market performance - ASPI), and the independent variable (exchange rate).

2.1. Theoretical Review

The flow-oriented model by Dornbush and Fischer (1980) argued that a rise in the EXR: depreciation of the local currency drives up overall production costs in the economy, which leads to a downward revision of the investors' expected rate of return and impacts stock market prices. Moreover, it stated that fluctuations in EXR affect a company's competitiveness, which in turn impacts its revenue or cost of capital and ultimately its stock prices. Also, Dornbusch and Fischer (1980) stated that the major argument of this theory is that the appreciation or depreciation of the domestic currency raises or lowers exports.

Furthermore, the Portfolio Balance Approach (PBA) argues that exchange rates are influenced by stock prices rather than by the flow-oriented model (Eiteman et al., 2004). In line with the PBA, market mechanisms lead EXR, and stock prices lead exchange rate changes in a negative direction. In addition, this theory proposes that investors adapt their portfolios to take advantage of exchange rate volatility and invest in a more diverse portfolio. Moreover, rising exchange rates encourage both domestic and foreign investors to invest in the local stock market when stock prices are rising (Branson et al., 1977). They further explained that the stock-oriented approach, or the PBA, identifies capital accounts as the key factor affecting EXR fluctuations. The theory holds that changes in stock indices influence the investment decisions of both local and foreign investors, which in turn affect demand for money and, subsequently, the exchange rate.

In accordance with portfolio theory, the EXR is probably determined by capital account activities. An increase in stock prices attracts foreign investors, resulting in inflation and capital inflows (Ravazzolo, 2005). According to the PBA, the exchange rate will increase when the stock index shows an upward trend, as this encourages investors to increase their investments (Branson, 1983). Based on this theory, Sikhosana and Aye (2018) found that the stock market negatively influences foreign currency markets. On the contrary, the local currency is driven to depreciate by lower stock prices, demonstrating that EXR and stock prices have a negative relationship.

The Arbitrage Pricing Theory (APT) proposed by Ross (1976) states that movements in stock prices are driven by various economic factors that affect future discount rates and dividends. Furthermore, it is argued that individuals favour investment portfolios with particular systemic risk. Therefore, APT suggests that stock prices may be affected by actions that affect the EXR. According to Etale and Eze (2019), the expected returns of financial assets are significantly influenced by macroeconomic variables, and these effects ultimately shape the overall performance of these assets. The study found that the EXR had a significant positive impact on all share indices, consistent with the APT. Thus, the theories discussed above

provide the theoretical foundation for formulating the relationships examined in the present study.

2.2. Empirical Review

The relationship among exchange rate dynamics, macroeconomic fundamentals, and stock market performance has become an increasingly important area of empirical investigation, particularly amid economic crises and macroeconomic uncertainty in Sri Lanka. Jameel and LockTeng (2021) have examined the effect of the exchange rates on share prices by considering structural breaks in monthly share prices on the CSE from 1997 to 2017. The findings identified that the US Dollar is the major currency in Sri Lanka's stock market. They revealed that the USD exhibits a positive effect on stock market returns in the first structural break period. In contrast, there is no impact on stock market returns in the second and third structural break periods corresponding to long-run outcomes in the structural breaks. Thus, the study has concluded that fluctuations in the exchange rate affect the stock market in Sri Lanka. Still, that effect does not last for long and varies across structural break periods and foreign currencies.

Similarly, Madurapperuma (2022) examined the relationship between ASPI and macroeconomic variables in Sri Lanka using monthly data from 2010 to 2021. The findings indicated the existence of a certain long-run steady relationship between share price and macroeconomic factors, including EXR. Moreover, the study highlighted the influence of macroeconomic instability during the economic downturn on stock market volatility, suggesting that exchange rate fluctuations may have affected investor confidence and investment decisions.

Bhuvaneshwari and Ramya (2017) aimed to identify the relationship between the monthly exchange rate and stock prices in India from 2006 to 2015. The results showed a strong and significant short-term relationship between the exchange rate and stock prices, but no long-term cointegration between the variables. As a result, the researcher emphasised that market participants cannot predict the markets due to the lack of a long-run co-integration relationship. Moreover, Bhuvaneshwari and Ramya (2017) revealed that the exchange rate influences stock prices, and vice versa, indicating bidirectional causality.

The long and short-term impact of monetary terms such as the exchange rate, inflation, interest rates, and the money supply on the Indian stock exchange has been examined in several studies, which have found a significant negative effect of the exchange rate on the Indian stock market in both the long and short run. Moreover, it indicates that the stock

market is significantly affected by structural changes (Lakshmanasamy, 2021; Bhattacharjee & Das, 2022).

However, in contrast to studies reporting a negative relationship, Jayasundara et al. (2019) found that the USD exchange rate positively affects share prices in Sri Lanka, suggesting that policymakers should accept exchange rate depreciation to promote investment in the capital market. Consistent with this, the findings of Prananta and Alexiou (2023) showed a positive relationship between the US Dollar/Indonesian Rupiah exchange rate and the stock index. Further, this had an asymmetric impact, revealing that decreases in stock prices lead to exchange rate depreciation. This study was conducted in Indonesia for a full sample of 10 years from 2012 to 2021, while a 2-year sub-sample from 2020 to 2021 was used to explore the relationship between the capital market and the exchange rate using the non-linear autoregressive distributed lag (NARDL) methodology.

Furthermore, the study conducted by Diftar (2023) revealed a significant positive effect of the exchange rate on stock market returns using an autoregressive distributed lag (ARDL) model. This study utilised daily data from 2019 to 2022 in seven emerging countries. The study identified a long-run relationship between the exchange rate and stock market performance, suggesting that an appreciation of the domestic currency may be associated with improved stock market performance. It further indicated that investors may view a stronger currency as a positive signal when making investment decisions.

Islam et al. (2020) examined the relationship between Bangladesh's stock market indices and macroeconomic variables, including the exchange rate, for the period 2009-2017. The ARDL test results indicate a long-run relationship between the variables, and the long-run coefficient shows that the exchange rate has a significant positive effect on stock prices. Thus, the study findings suggested that the stock index will increase when the local currency appreciates against the USD.

The study conducted by Gooneratne and De Silva (2022) assessed the monthly exchange rate and ASPI data from 2000 to 2019 to examine the impact of the exchange rate on stock market performance. They argued that the exchange rate does not affect the performance of the stock market and revealed that there is no significant relationship between the exchange rates and the ASPI, contrary to Jameel and LockTeng (2021). Their conclusion suggests that, in the Sri Lankan context, there is no significant cointegration between stock market performance and the exchange rate.

Similarly, the study conducted by Ediriweera and Dissanayake (2022) revealed that the volatility of the exchange rate has no significant influence on the performance of the Colombo stock market. This research aimed to investigate the effect of macroeconomic

factors on stock market performance in the Sri Lankan context using monthly data from 2002 to 2019. The researchers developed a GARH (1,1) model to explore the effects of variables on ASPI, and the results revealed that by maintaining a stable currency level and focusing on the time value of money, speculative investors can actively engage in the Sri Lankan stock market. However, the study conducted by Anusha et al. (2022) found that there is a short-run direct relationship between the exchange rate and the stock index, whereas the long-run relationship is insignificant.

The existence of a short-run positive relationship between the exchange rate and stock market performance is further evidenced by the study conducted by Okere et al. (2021) in the Nigerian context. The study used monthly data from 1995 to 2019 and employed a non-linear ARDL co-integration analysis. The results indicated that, in the long run, the exchange rate appeared to be insignificant, while the short-run relationship was statistically significant.

The short-run and long-run relationships between exchange rates and stock market performance have revealed mixed findings across different countries and periods. For instance, Khalid (2017) examined the effects of interest and exchange rates on stock market performance in Pakistan using annual data from 1990 to 2017. By applying the Johansen Co-integration Error Correction Model and Variance Decomposition, the short-term and long-term relationships between the variables were analysed. The results of the Johansen test implied that there is a positive long-run impact of the exchange rate on Pakistan stock market volatility. Moreover, the Error Correction Model indicates that a 1% increase in the exchange rate in the short run will lead to a 2.58% increase in the stock market index.

Etale and Eze (2019) investigated the stock market reaction to macroeconomic variables in the Nigerian context using annual data from 1985 to 2017. The all-share index (ASI) was used as a proxy for the dependent variable, stock market performance, while selected macroeconomic factors, including the exchange rate, were used as independent variables. The results indicate that Nigerian stock market performance and the selected macroeconomic variables have both long-term and short-term relationships; in particular, the exchange rate has a significant positive impact on stock market performance.

The dynamic dependence and causality between exchange rate fluctuations and stock market indices volatility of BRICS countries were examined by Mroua and Trabelsi (2019). The study employed daily data from 2008 January to 2018 February to examine the long-run and short-run relationships. The GMM model/Panel's findings showed that the volatility of prevailing returns on BRICS return indexes is significantly affected by the prior day's stock index and exchange rate fluctuations. Thus, Mroua and Trabelsi (2019) suggested that

exchange rate movements significantly affect stock market index returns in both the short and long run across BRICS countries.

Despite the growing body of empirical literature on the relationship between exchange rates and stock market performance, the effect of structural breaks in exchange rates on stock market volatility across different structural break periods during economic downturns remains underexplored in the Sri Lankan context. Therefore, the current study attempts to address this research gap.

3. Methodology

Testing the effect of exchange rate structural breaks on exchange rate volatility:

The following ARMA(p,q) - EGARCH(1,1) volatility regression model has been developed to test the effect of structural breaks in exchange rates on exchange rate volatility. As advocated in the previous empirical study by Peiris and Dayaratne (2012), when developing the volatility regression model, the Auto Regressive Moving Average (ARMA) model was considered the mean model. To develop an ARMA(P,Q) specification, autoregressive and moving average specifications were combined (Walakumbura et al., 2024). The following are the specifications of the ARMA (p, q) mean model.

$$\boldsymbol{EXR_t = \theta_0 + \theta_1 EXR_{t-1} + \cdots + \theta_p EXR_{t-p} - \emptyset_1 \varepsilon_{t-1} - \cdots - \emptyset_p \varepsilon_{t-q} + \varepsilon_t} \quad (1)$$

Where, EXR_t is the Exchange rate at time "t". $\theta_0, \theta_1, \ldots \theta_p$ are the Autoregressive coefficients for the EXR towards "p" lags. $EXR_{t-1} + \cdots + EXR_{t-p}$ are past values of the EXR towards "p" lags. $\emptyset_1 \ldots \emptyset_q$ are moving average coefficients for the error term towards "q" lags. $\varepsilon_{t-1} - \cdots - \varepsilon_{t-q}$ are past values of the error term towards "p" lags, and ε_t is the error term at time "t".

GARCH modelling approaches are applied to generate the volatility series. For analysing volatility, the most frequently applied time-series modelling technique is the GARCH model (Peiris & Dayaratne, 2012). Through the combination of the mean and a conditional variance equation, a GARCH model is developed by Peiris and Peiris (2011). The mean model's error term is controlled by the GARCH model, which indicates that the GARCH model identifies the error term in two components, as follows (Ampadu et al., 2024).

$$\boldsymbol{e_t = Z_t + \sigma_t} \quad (2)$$

Where Z_t is the heteroscedasticity component, and σ_t is the standard deviation.

The following are the specifications of the GARCH (1, 1) model.

$$\boldsymbol{\sigma_t^2 = \omega + \sum_{i=1}^{q} \alpha_i \varepsilon_{t-i}^2 + \sum_{i=1}^{p} \beta_i \sigma_{t-1}^2 + \beta_1 D_1 + \beta_2 D_2 + \cdots + \beta_n D_n + \varepsilon_t} \quad (3)$$

Where, σ_t^2 is the conditional variance. ω , α_i , β_i are nonnegative constants. $\alpha_i \varepsilon_{t-i}^2$ is the ARCH term and $\beta_i \sigma_{t-1}^2$is the GARCH term. β is the coefficient of dummy variables. D_n represents dummy variables, and ε_t is the error term.

The GARCH model was extended to the EGARCH model, as it is more successful in describing excess conditional variance in stock indices and exchange rates by utilising a generalised exponential distribution. The specifications for the conditional variance are as follows;

$$\boldsymbol{\log(\sigma_t^2) = \omega + \sum_{j=1}^{q} \beta_j Log(\sigma_{t-j}^2) + \sum_{t=i}^{p} \alpha_i \left|\frac{\varepsilon_{t-i}}{\sigma_{t-i}}\right| + \sum_{k=1}^{n} \gamma_k \frac{\varepsilon_{t-k}}{\sigma_{t-k}}} \quad (4)$$

Since the currency and stock markets are asymmetric when structural breaks are occurring EGARCH model was used as it includes the level $\left|\frac{\varepsilon_{t=i}}{\sigma_{t=i}}\right|$ with γ_k coefficient, implies that the EGARCH is asymmetric (Peiris, 2012).

Testing the effect of ASPI structural breaks on stock market volatility:

The following ARMA (p,q) - EGARCH (1,1) volatility regression model has been developed to test the effect of structural breaks in ASPI on stock market volatility. The following are the specifications for the ARMA(p, q) mean model.

$$\boldsymbol{ASPI_t = \theta_0 + \theta_1 ASPI_{t-1} + \cdots + \theta_p ASPI_{t-p} - \emptyset_1 \varepsilon_{t-1} - \cdots - \emptyset_p \varepsilon_{t-q} + \varepsilon_t} \quad (5)$$

Where $ASPI_t$ is the ASPI at time "t". θ_0 , θ_1 , ... θ_p are autoregressive coefficients for the ASPI towards "p" lags. $ASPI_{t-1} + \cdots + ASPI_{t-p}$ are the past values of the ASPI towards "p" lags. $\emptyset_1$ ... $\emptyset_q$ are moving average coefficients for the error term towards "q" lags.

Testing the causal nexus between the exchange rate and stock market volatility

The following Diagonal Vech (DVECH) MGARCH model has been developed to test the causal nexus between exchange rate and stock market volatility, and, through this, real-world events were used to explain the causal nexus between exchange rate structural breaks and stock market volatility structural breaks. The following are the specifications of the DVECH (1, 1) model (Bala & Takemoto, 2017).

$$\boldsymbol{H_t = C + A^{\circ}(\varepsilon_t - 1\varepsilon_{t-1}') + B^{\circ} H_{t-1}} \quad (6)$$

4. Results and Discussion

To test stationarity, the Augmented Dickey-Fuller (ADF) test was applied, and the results are presented in Table 4.1. According to the following table, none of the variables become stationary at the level data, as their p-values are greater than 0.05. Both variables become stationary in their first difference.

Table 4.1: Test Results of the Unit Root Tests for the Sample Periods

	Level	1st Difference
ASPI	0.3143	0.0000
EXR	0.7450	0.0000

Source: EViews Output (2025)

Structural Break Test

To identify structural breaks in ASPI and EXR during the sample period, the Bai-Perron structural break test was applied. The test results are presented in the following table.

Table 4.2: Test Results of the Structural Break Test

Estimated Break Dates	
ASPI	**EXR**
12/19/2013	3/18/2014
12/15/2015	12/15/2015
4/19/2018	4/19/2018
5/12/2020	5/26/2020
3/09/2022	2/28/2022

Source: EViews Output (2025)

According to Bai-Perron, the structural break test indicates five different structural break dates for both variables. The tests were conducted using dummy variables, with one applied to the identified structural break periods and zero to the other dates.

Volatility Regression Result

The $ARMA_{(p, q)}$ - EGARCH(1, 1) model was developed to investigate the effect of structural breaks in the ASPI on stock market volatility. $ARMA_{(1\ 0)}$, $ARMA_{(0\ 1)}$, and $ARMA_{(1\ 1)}$ models were considered when fitting the mean model following the empirical study by Peiris and Peiris (2011). The results of the tests are shown in the following table.

Table 4.3: $ARMA_{(p, q)}$ - $EGARCH_{(1, 1)}$ – DASPI

Model	Mean Model		Variance Model			
			ω	**α**	**γ**	**β**
AR(1)	AR(1)	0.226352*	0.184335*	0.303913*	-0.030057*	0.956322*

MA(1)	MA(1)	0.207281*	0.184634*	0.300942*	-0.024528*	0.956603*
ARMA (1 1)	AR(1)	0.567612*	0.195433*	0.308816*	-0.037064*	0.954778*
	MA(1)	-0.369919*				

Source: EViews Output (2025)
Note: * denotes statistical significance at 0.05 probability value

The results indicate that all the considered AR(1), MA(1), and ARMA(1,1) models are significant at the 5% confidence level. Among the significant models, the best-fit model was selected based on the minimum Akaike Information Criterion (AIC). Based on the minimum AIC value, the ARMA1,1 – EGARCH1,1 volatility regression model was considered the best-fit model. In that model, all the coefficients are significant (P-values<0.05). Moreover, a negative γ implies an asymmetric effect: negative shocks have a greater impact on increasing stock market volatility than positive shocks of the same magnitude. Positive ARCH and GARCH terms imply that current volatility in the stock market is positively and significantly affected by past shocks, indicating a high degree of volatility persistence.

Table 4.4: ARMA $_{(p, q)}$ - EGARCH $_{(1, 1)}$ – DEXR

Model	Mean Model		Variance Model			
			ω	α	γ	β
AR(1)	AR(1)	0.446255*	0.24367*	0.531523*	0.074930*	0.918738*
MA(1)	MA(1)	-0.33624*	0.23360*	0.528496*	0.079609*	0.921395*
ARMA (1 1)	AR(1)	0.364805*	-0.25317*	0.547863*	0.077217*	0.915963*
	MA(1)	0.102013*				

Source: EViews Output (2025)
Note: * denotes statistical significance at 0.05 probability value

The results indicate that the AR(1), MA(1), and ARMA(1,1) models are significant at the 5% confidence level. Among the significant models, the best-fit model was determined using the minimum Akaike Information Criterion (AIC). Based on the minimum AIC value, the ARMA$_{1,1}$ – EGARCH$_{1,1}$ volatility regression model was considered as the best fitted model. In that model, all the coefficients are significant (P-values<0.05). Moreover, the significant coefficient of γ implies the significant level of asymmetric effect that implies there is an obvious leverage effect in exchange rate. While positive ARCH and GARCH terms imply that the present volatility of the exchange rate is positively and significantly affected by past shocks, indicating a significant level of volatility determination.

Table 4.5: Tested dummy variables from fitted ARMA$_{1,1}$ – EGARCH$_{1,1}$

ASPI		
Variable	**Coefficient**	**Probability**
D1	-0.109634	0.0000
D2	-0.131007	0.0000
D3	-0.079288	0.0000
EXR		

Variable	Coefficient	Probability
D1	-0.426954	0.0000
D2	-0.224612	0.0000
D3	-0.316325	0.0000

Source: EViews Output (2025)

To avoid the dummy variable trap, out of the four dummy variables, only three dummy variables are considered. In addition, the excluded fourth dummy variable is considered as the benchmark structural break when interpreting the other structural break periods, as done in the previous empirical study, Sahoo (2021). In ASPI, all the coefficients of dummy variables are negative and significant. In ASPI, the effect of structural break period one on stock market volatility is higher by -0.109634 relative to structural break period four, while the effect of structural break period two and three on stock market volatility is also higher by -0.131007 and -0.079288, respectively, relative to structural break period four.

When considering the EXR, the effect of structural break period one on exchange rate volatility is higher by -0.426954 relative to structural break period four, while the effect of structural break period two and three on exchange rate volatility are also higher by -0.0224612 and -0.316325, respectively, relative to structural break period four.

Causal Nexus Results

The DVECH MGARCH Model was developed to investigate the causal nexus between EXR and SMV. The result of this test is exhibited in the following table.

Table 4.6: DVECH MGARCH Model Results

Variable	DASPI	DEXR
C 1 1	26.9569*	0.00639
C 1 2	0.00639	0.000123*
A 1 1	0.182936*	0.000189
A 1 2	0.000189	**0.89924***
B 1 1	0.842221*	0.988831*
B 1 2	**0.988831***	**0.733259***

Source: EViews Output (2025)

The results indicate that for the cross-volatility spillovers, coefficients of the variance and covariance equations are positive and significant. It implies the existence of ARCH and GARCH effects. When considering about the cross volatility effects between these two variables, past shocks of stock market have effect on exchange rate volatility and vice versa. It implies that there is a volatility spill over from one to another or in another words there is a causal nexus between two variables. Finally, to investigate the causal nexus between exchange rate structural breaks and stock market volatility, structural breaks following real-world news/events analysis were performed.

According to the annual report of BOI (2013), it stated that in alignment with CHOGM, Sri Lanka has hosted a business forum, which was Sri Lanka's ever-largest business conference. Moreover, various powerful and influential businesspersons and investors attended the forum, which had a significant impact on the country's economic growth. As and when the investments were flowing to the country with the attraction to the growth in economy, within a considerable period of that, the stock market also showed a significant upward trend in ASPI with a structural break on 12/19/2013. Prior to the break date, the SMV shows slight changes, while after the break it shows an upward trend, suggesting that the event took several dates to adjust in the SMV. Moreover, when foreign direct investment inflows into the country increase, EXR appreciates, and during this break period, EXR also appreciated for a certain period, as usual.

Within a short period after the ASPI structural break date, the EXR break occurred on 3/18/2014. There, the impact of unproven guilt for war crimes and human rights violations was adversely impacted on the country. As a result of those unfavourable factors at the conference, Sri Lanka created a bad image and several uncertainties in the country among investors, exporters, importers, and other parties. As a result, Sri Lanka experienced a lack of foreign investment, which ultimately led to a structural break in the depreciation of the EXR. Nevertheless, such uncertainties have happened in the country, due to the depreciation of the EXR. It is favourable for the investors to have more investment income. Thus, ASPI has increased during the first few days of that break period. The first break dates indicate that the break in ASPI led to a structural break in EXR.

The proposal to provide an additional tax holiday year to the foreign listed companies was to attract foreign investments to the country as mentioned in the budget speech led to an increase in the ASPI and an appreciation of the EXR. Since, that news has made a favorable sentiment between investors and more foreign investments inflows to the country. That incident ultimately resulted to appreciation of EXR and a structural break in both the markets on 12/15/2015. At that break both variables imply that there's an impact from one variable to other variable through significant economic incidents.

By reducing the lending rate on 3rd April 2018, it has affected to the SMV as the cost of borrowings in businesses reduces and lead local currency to be more valuable. Thereby foreign investments to the country reduced and caused to an appreciation of EXR. That incident ultimately led to a break on 4/19/2018 in both the markets. At that break also both variables imply that there's an impact from one variable to other variable through significant economic incidents.

The fourth structural break first occurred in the stock market on 5/12/2020. Despite the imposition of import restrictions in 16th April, the stock market was closed for travel restrictions and reopened on 5/11/2020 and then ultimately impacted on stock market volatility. When import restrictions were imposed, net exports will increase and foreign buyers have to pay more on exports. Thereby EXR has depreciated and as it is beneficial to the exporting companies, ASPI has increased. Moreover, the structural break in the exchange rate has also occurred few days after that, on 5/26/2020. This was also due to the same incident as re-imposing an update of the previously imposed import restriction list. Accordingly, it can be suggested that there is a causality between the two variables as the breaks occurred within a few days in both markets for the same incidents.

The last break date first occurred in the exchange rate on 2/28/2022. Several individual incidents were caused to the high volatility of the exchange rate and few days later, on 3/4/2022 the CBSL announced to float and maintain a flexible exchange rate. It affected to the SMV on 3/9/2022 as when there is a flexible and floating exchange rate it is more favorable to foreign investors as they are able to have more returns. Finally, all the news and incidents analysed above show that incidents that cause a structural break in the stock market volatility will ultimately cause a structural break in the exchange rate and vice versa. That implies as there is a causal nexus between exchange rate structural breaks and stock market volatility structural breaks.

5. Conclusion

The findings of this study underscore the critical interplay between exchange rate structural breaks and stock market volatility, highlighting the need for robust policy frameworks to mitigate their adverse effects. Thereby, Sri Lanka can foster a more resilient financial ecosystem, ensuring greater stability and predictability in both the exchange rate and stock market, which are essential for long-term economic growth. In this study, only the volatilities in the exchange rate are considered than considering other macroeconomic elements. Furthermore, studies can be incorporated by considering additional macroeconomic factors such as inflation and interest rates. Moreover, the study intends only to study in Sri Lankan context but not the other countries. Therefore, further studying can consider other contexts and exchange rates.

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CHAPTER TWO

Impact of Green Banking Adoption as a Sustainable Banking Practice for Banks' Environmental Performance: Evidence from Colombo District in Sri Lanka

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Abstract

Green banking promotes environmentally sustainable practices by reducing carbon footprints, minimising paper consumption, investing in renewable energy, and providing green loans. However, the banking sector in Sri Lanka has yet to fully embrace the concept of green banking. This study examines the impact of green banking adoption on banks' environmental performance in the Colombo District, Sri Lanka. A quantitative research approach was employed, using a structured questionnaire administered to 70 bankers selected from seven banks engaged in green banking practices. The study investigates four dimensions of green banking: employee-related practices, operational-related practices, customer-related practices, and policy-related practices. These dimensions were treated as independent variables, while banks' environmental performance was considered the dependent variable. Multiple linear regression analysis was used to test the proposed hypotheses. The findings revealed that employee-related practices, particularly environmental training and education, and policy-related practices, including establishing green branches and implementing environmental policies, significantly influenced banks' environmental performance. In contrast, operational-related and customer-related practices did not demonstrate statistically significant effects. The study recommends strengthening employee competencies and institutional environmental policies to improve environmental performance.

Keywords: *Banking Sector, Environmental Performance, Environmental Sustainability, Green Banking, Sustainable Banking Practices.*

1. Introduction

Environmental sustainability has become a critical global concern, leading to the emergence of green or sustainable banking as an important concept within the financial sector. Sustainable banking incorporates environmentally responsible practices such as paperless transactions, digital banking, energy-efficient operations, employee environmental awareness, and financing eco-friendly projects to reduce the environmental impact of banking activities. Prior studies suggest that environmentally responsible banking practices can improve environmental and financial performance, highlighting the growing responsibility of banks to balance profitability with environmental stewardship (Buallay, 2019; Chen et al., 2022; Thapliyal et al., 2025). In Sri Lanka, the banking sector plays a vital role in economic development (CBSL, 2024), while initiatives such as the Central Bank of Sri Lanka's Roadmap for Sustainable Finance have encouraged the integration of sustainability into banking activities (CBSL, 2019, 2025). Nevertheless, the continued reliance on paper-based processes and varying levels of adoption of digital banking, renewable energy, and environmentally responsible lending indicate that translating sustainability initiatives into measurable environmental improvements remains a concern. Sri Lanka's decline in the Environmental Performance Index ranking, from 70th in 2018 to 109th in 2020, further reflects the broader environmental challenges facing the country (Wendling et al., 2018).

Despite this background, the research problem concerns the extent to which sustainable banking practices contribute to improved environmental performance within the Sri Lankan banking sector. Although previous research has established relationships between green banking practices and environmental performance, evidence remains context-dependent, and the relative contribution of different dimensions of sustainable banking requires further empirical examination. In Sri Lanka, Dewasiri et al. (2024) found significant relationships among employee-, operational-, customer-, and policy-related green banking practices and environmental performance. However, further evidence is needed to strengthen the understanding of these dimensions and their contributions to environmental performance in the evolving sustainable-finance landscape. Therefore, this study aims to examine the impact of sustainable banking practices on banks' environmental performance in Sri Lanka, with a focus on employee, operational, customer, and policy-related practices.

The study contributes to the sustainable banking literature by providing further empirical evidence from the Sri Lankan banking context and by examining sustainable banking through its key dimensions. The findings can provide practical insights for bank managers in identifying and strengthening practices that support environmental performance. Furthermore, the study can assist policymakers and regulatory authorities in evaluating existing sustainable-

finance initiatives and developing appropriate regulations and incentives to encourage more effective sustainable banking practices. The following section reviews the relevant theoretical and empirical literature to establish the relationships between the identified sustainable banking practices and environmental performance.

2. Literature Review

2.1. Theoretical Review

The adoption of sustainable banking practices can be explained through three complementary theoretical perspectives: Corporate Social Responsibility (CSR) Theory, Stakeholder Theory, and Institutional Theory. CSR Theory emphasises banks' responsibility to minimize their environmental impact and contribute to long-term societal well-being through practices such as green lending, resource conservation, and energy-efficient operations (Jamali, 2007; O'Riordan, 2008). Moreover, Stakeholder Theory suggests that environmental expectations from customers, employees, regulators, investors, and communities encourage banks to integrate sustainability into their activities. The theory further highlights the importance of addressing the needs and expectations of stakeholders which would ensure the successful adoption of green banking practices (Freeman, 2020). Institutional Theory further explains that regulatory requirements, professional norms, and societal expectations create pressures for banks to adopt environmentally responsible practices (Willmott, 2015).

The three theories collectively provide the ground explanations for the relationship between green banking practices and environmental performance conceptualized in the study. Partcularly, the theories support the examination of employee-related, operational-related, customer-related, and policy-related green banking practices as potential determinants of banks' environmental performance. However, the extent to which each dimension contributes to environmental outcomes remain an empirical question that must be established through statistical analysis. This theoretical foundation therefore informs the study's conceptual framework and provides a basis for investigating the relationship between the four dimensions of green banking adoption and environmental performance in Sri Lanka's banking sector.

2.2. Empirical Review

Banks' environmental performance reflects the extent to which banking activities contribute to environmental sustainability through reduced resource consumption, energy efficiency, lower emissions, and effective environmental management. Although banks have relatively low direct environmental impacts, their operational activities and financing decisions can

influence broader environmental outcomes. Green banking practices, including paperless banking, digital services, energy-efficient operations, green lending, and sustainable investments, have been associated with improved resource efficiency and environmental management (Biswas, 2011; Bose et al., 2017; Choubey & Sharma, 2022). Empirical studies have also reported that green banking initiatives can reduce carbon emissions and improve environmental performance (Zhang et al., 2022). However, findings differ across countries and practices, indicating the importance of examining these relationships within specific institutional contexts.

Employee-related practices are an important internal dimension of sustainable banking, as employees implement environmental initiatives through their knowledge, awareness, training, and workplace behaviour. Employee participation in sustainability activities can encourage resource conservation and strengthen an environmental culture within banks. This relationship is supported by Stakeholder Theory, which identifies employees as important internal stakeholders. However, empirical evidence is mixed: some studies report positive relationships between employee-related practices and environmental performance, while others find insignificant effects (Risal & Joshi, 2018; Chen et al., 2022). This inconsistency warrants further examination of employees' roles in achieving environmental performance.

Operational practices involve integrating environmental considerations into banks' day-to-day activities through paperless transactions, electronic documentation, digital banking, energy-efficient technologies, waste reduction, and renewable energy use. These practices can directly reduce paper consumption, energy use, and other resource requirements associated with conventional banking operations (Hoque et al., 2019). From a CSR perspective, such practices demonstrate banks' direct environmental responsibility, while Institutional Theory explains their adoption through technological developments and environmental expectations. Empirical evidence generally indicates a positive relationship between operational green banking practices and environmental performance (Risal & Joshi, 2018; Gulzar et al., 2024).

Customer-related practices reflect banks' efforts to encourage customers to participate in environmentally responsible financial activities. Digital banking, electronic statements, online transactions, green loans, sustainable investment products, and customer awareness programmes can reduce resource consumption and promote environmentally responsible behaviour. Stakeholder Theory provides a basis for this relationship, as banks respond to customers' growing environmental expectations (Freeman, 2020). Green financial products can also channel funds towards renewable energy, energy efficiency, and environmentally friendly projects (Bihari & Pradhan, 2011; Sudhalakshmi & Chinnadorai, 2014). Nevertheless, empirical findings remain inconsistent, with some studies identifying positive

environmental effects while others report insignificant relationships (Finger et al., 2018; Chen et al., 2022).

Policy-related practices provide the formal mechanisms through which environmental considerations are incorporated into banking activities. These include environmental policies, sustainability guidelines, environmental risk-management procedures, green financing policies, sustainability reporting, and environmental criteria in lending and investment decisions. Institutional Theory is particularly relevant because regulations, professional standards, and societal expectations influence banks' environmental policies (Willmott, 2015). Studies indicate that policy-related practices can positively influence environmental performance, particularly when policies are effectively implemented and monitored (Risal & Joshi, 2018; Chen et al., 2022). However, the existence of policies alone may not guarantee improved environmental outcomes, as implementation and organisational commitment are important. Overall, the literature suggests that employee-, operational-, customer-, and policy-related practices provide distinct pathways through which banks can improve environmental performance. CSR Theory explains banks' environmental responsibilities, Stakeholder Theory explains the influence of employees and customers, and Institutional Theory explains the role of regulations, norms, and institutional pressures. Despite growing research, empirical findings remain inconsistent, particularly regarding employee-, customer-, and policy-related practices, while evidence from developing economies remains context-specific. Furthermore, much previous research has focused on financial, reputational, or adoption outcomes rather than directly examining environmental performance (Rehman et al., 2021). Therefore, further context-specific evidence is required, particularly in Sri Lanka. Accordingly, the conceptual framework of this study proposes that employee-related practices, operational-related practices, customer-related practices, and policy-related practices influence banks' environmental performance, with these relationships theoretically grounded in CSR Theory, Stakeholder Theory, and Institutional Theory.

3. Methodology

This study adopts a quantitative research approach to examine the impact of green banking practices on banks' environmental performance. A quantitative research design is appropriate because the study seeks to measure relationships between variables and empirically test the proposed hypotheses using numerical data (Creswell, 2014).

The study population comprises all branches of licensed commercial banks operating in the Colombo District of Sri Lanka as of 30 June 2023 and registered with the Central Bank of Sri Lanka (CBSL). Seven commercial banks, namely Bank of Ceylon, People's Bank,

Commercial Bank of Ceylon PLC, Hatton National Bank PLC, Sampath Bank PLC, National Development Bank PLC, and Seylan Bank PLC, were purposively selected based on their significant presence in the Sri Lankan banking sector and their engagement in sustainable and green banking practices. The selected banks also represent both state-owned and private commercial banks, providing coverage of different ownership structures.

A cluster sampling approach was used to select the Colombo District as the geographical study area, followed by random sampling to select branches within the identified banks. This approach is consistent with the sampling procedure employed by Shaumya and Arulrajah (2016), who applied cluster and random sampling in studying green banking practices in Sri Lanka. To ensure representation across all seven selected banks, 10 branches were randomly selected from each bank. Accordingly, the final sample comprised 70 bank branches, with 10 from each of the seven selected commercial banks.Primary data were collected through a structured questionnaire developed based on prior studies, particularly Zhang et al. (2022). The survey was administered online to branch managers via email and social media platforms. The questionnaire consist of demographic questions and items measuring green banking practices, namely employee-related, operational-related, customer-related, and policy-related practices as well as banks' environmental performance. All measurement items were assessed using a five-point Likert scale. Green banking practices were conceptualized as the independent variables, while banks' environmental performance measured through energy consumption reduction, carbon emission minimization, and compliance with environmental standards was treated as the dependent variable (Shaumya & Arulrajah, 2016; Zhang et al., 2022). The conceptual framework was developed based on existing literature to test four hypotheses linking green banking practices to environmental performance (Chen et al., 2022; Rehman et al., 2021).

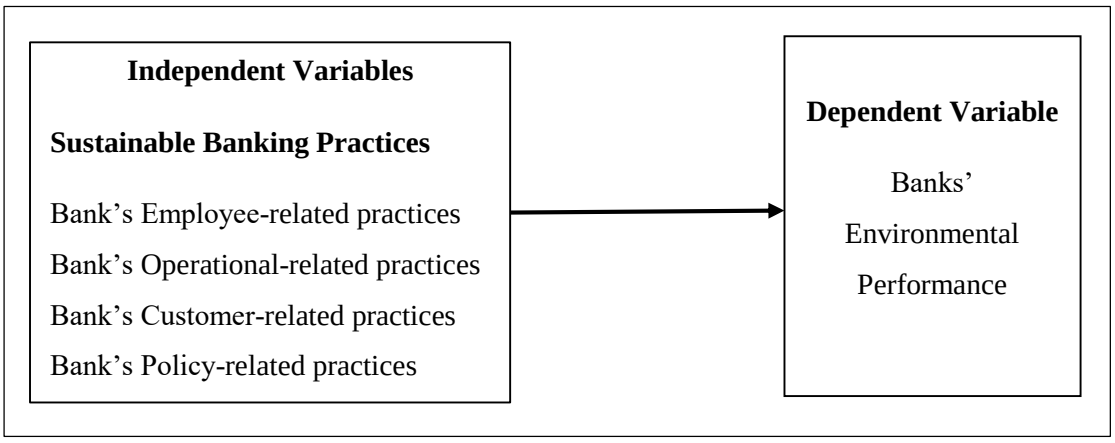


Figure 3.1: Conceptual Framework
Source: Developed by Author

Data analysis was conducted using quantitative statistical techniques, including validity and reliability testing, correlation analysis, and multiple regression analysis. Construct validity was assessed using the Kaiser–Meyer–Olkin (KMO) measure and Bartlett's Test of Sphericity, with acceptable thresholds guided by Field (2009). Reliability was evaluated using Cronbach's alpha, following the criteria suggested by Sekaran and Bougie (2016).

Pearson correlation analysis was employed to examine the direction and strength of relationships among variables. To assess the impact of green banking practices on environmental performance, multiple regression analysis was applied, as the study involved multiple independent variables and a single dependent variable (Sekaran & Bougie, 2016). Model fitness and explanatory power were evaluated using R^2 values, ANOVA statistics, and regression coefficients, following established analytical guidelines (Field, 2009). Overall, the methodological framework provides a systematic and reliable approach to examining the relationship between green banking practices and environmental performance in the Sri Lankan banking sector.

The regression model used in this study is specified as follows:

$$\boldsymbol{Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \varepsilon} \quad (1)$$

Where,

Y = Banks' environmental performance

X_1 = Banks' employee-related practices

X_2 = Banks' operational-related practices

X_3 = Banks' customer-related practices

X_4 = Banks' policy-related practices

β_0 = Constant term

β_1, β_2, β_3, β_4 = Regression coefficients; and

ε = the error term

4. Results and Discussion

4.1. The Reliability of the Measures

The study used Cronbach's Alpha (CA) reliability coefficient to measure how closely the set of items is related as a group. Sekaran and Bougie (2016) have suggested using Cronbach's alpha to assess reliability. They stated that a Cronbach's alpha < 0.7 (CA<0.7) indicates poor reliability. Also if Cronbach's Alpha is more than 0.7 (CA>0.7), it indicates that the variables have a good internal consistency.

Table 4.1: Reliability Test Results

Variables	Items	Cronbach's Alpha Value
Bank's employee related practices	3	0.770
Bank's operational related practices	3	0.575
Bank's customer related practices	3	0.657
Bank's policy related practices	3	0.744
Banks environmental performance	3	0.875

Source: The author's calculations.

According to Table 4.1, the Researcher measured the CA value separately for dependent variables and independent variables. Then, Bank's operational practices (CA=0.575) and Bank's customer-related practices (CA=0.657) have poor reliability, whereas the other variables have good internal consistency.

4.2. The Validity of the Measures

Kaiser-Meyer-Olkin (KMO) value tests sampling adequacy. Accordingly, if the KMO value is more than 0.5 (KMO > 0.5), those variables are acceptable. If the KMO value is more than 0.7 (KMO > 0.7), those variables are considered good.

Table 4.1: Validity Test

Variables	KMO Value	Bartlett's Test of Sphericity Value	Factors
Bank's employee-related practices	0.648	0.000	3
Bank's operational-related practices	0.562	0.000	3
Bank's customer-related practices	0.534	0.000	3
Bank's policy-related practices	0.615	0.000	3
Banks' environmental performance	0.738	0.000	3

Source: The author's calculations

According to Table 4.2, the KMO values for all variables are greater than 0.5, indicating that the variables are acceptable. Bartlett's test is used to analyse whether the correlations between variables are sufficient for factor analysis. If the value is less than 0.05 (P < 0.05), factor analysis is considered appropriate. According to the test results, Bartlett's test of the sphericity value of all variables is less than 0.05 (p <0.05). Therefore, all variables are significant and suitable for factor analysis.

4.3. Factor Analysis

Factor loadings were examined to determine the extent to which each item represents its respective construct. Table 4.3 summarises the factor loadings of the measurement items used to assess the four dimensions of green banking practices and banks' environmental

performance. The reported loadings range from 0.566 to 0.910, provide initial evidence of the items' contribution to measuring the study variables.

Table 4.3: Factor Loadings

Variables	Factor Loadings Items	1	2	3	4	5
Bank's employee-related practices	EP 1	0.811				
	EP 2	0.782				
	EP 3	0.889				
Bank's operational related practices	OP 1		0.566			
	OP 2		0.857			
	OP 3		0.813			
Bank's customer related practices	CP 1			0.886		
	CP 2			0.732		
	CP 3			0.693		
Bank's policy related practice	PP 1				0.736	
	PP 2				0.893	
	PP 3				0.816	
Banks' environmental performance	BEP 1					0.910
	BEP 2					0.885
	BEP 3					0.892

Source: The author's calculations.

4.4. Correlations Analysis

Correlation analysis shows the association between dependent variables and independent variables. Pearson Correlation values range between -1.0 and +1.0. According to Table 4.4, there is a moderate positive correlation between the independent variables and the dependent variable.

Table 4.2: Correlation test

Variables	Banks' Environmental Performance	
Bank's employee-related practices	Pearson Correlation	0.839
	Sig. (2-tailed)	0.000
Bank's operational-related practices	Pearson Correlation	0.605
	Sig. (2-tailed)	0.000
Bank's customer-related practices	Pearson Correlation	0.653
	Sig. (2-tailed)	0.000
Bank's policy-related practices	Pearson Correlation	0.771
	Sig. (2-tailed)	0.000

Source: The author's calculations

4.5. Multicollinearity Test

The multicollinearity diagnostic checks whether independent variables are highly correlated among themselves. The study used Tolerance and Variance Inflation Factors (VIF) to determine that the variables are free from muticlinearity.

Table 4.3: Multicollinearity test

Variable	Tolerance	VIF
Bank's employee-related practices	0.361	2.768
Bank's operational-related practices	0.487	2.052
Bank's customer-related practices	0.406	2.465
Bank's policy-related practices	0.343	2.918

Source: The author's calculations.

According to Table 4.5, the VIF values for all variables are less than 5, and the Tolerance values are greater than 0.2. Hence, all Tolerance and VIF values are within the proper range, and multicollinearity has not been violated.

4.6. Normality Test

Skewness and Kurtosis statistics assess the symmetry of the data set. For instance, Shaumya and Arulrajah (2017), in the study of green banking practices in Sri Lanka, assessed the normality of the selected variables using skewness and kurtosis statistics. The skewness value should be near zero, whereas the suitable range of the Kurtosis value is between -2 to +2. According to the statistics in Table 4.6 below, four variables are within an acceptable range, suggesting that the variables follow a normal distribution. However, the Skewness of the bank's operational-related practices is not near zero, and the Kurtosis of the bank's operational-related practices is not within acceptable ranges. Hence, the data on the bank's operational-related practices did not follow the normal distribution.

Table 4.6: Normality

Variable	Skewness Statistics	Std. Error	Kurtosis Statistics	Std. Error
Bank's employee-related practices	-1.065	0.337	0.968	0.662
Bank's operational-related practices	-1.963	0.337	4.911	0.662
Bank's customer-related practices	-0.885	0.337	0.52	0.662
Bank's policy-related practices	-0.805	0.337	0.518	0.662
Banks' environmental performance	-0.991	0.337	0.552	0.662

Source: The author's calculations.

4.7. Regression Analysis

Table 4.7: Model Summary

Model	R^2	Adj. R^2	Std. Error of the Estimate	Change Statistics				Durbin-Watson
				R^2 Change	F Change	df1	df2	Sig. F Change	
1	0.753	0.731	0.51903595	0.753	34.222	4	45	0.000	1.632

Source: The author's calculations.

According to regression analysis, R^2 value is 0.753, suggesting that 75.3% of the variation in banks' environmental performance is explained by the combined effects of employee-related, operational-related, customer-related, and policy-related green banking practices. The adjusted R^2 value of 0.731 indicates that the model explains 73.1% of the variation after adjusting for the number of independent variables included.

4.8. ANOVA Test

Table 4.8: ANOVA Table

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	36.877	4	9.219	34.222	.000[b]
	Residual	12.123	45	.269		
	Total	49.000	49			

Source: The author's calculations.

According to the ANOVA statistics of this study, the F-statistic of 34 and the significance (0.000) indicate that the regression model is statistically significant. Thus, the results suggest that the four dimensions of green banking practices collectively explain the variation in banks' environmental performance.

4.9. Coefficients

Table 4.4: Coefficient test

Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	7.972E-17	.073		.000	1.000
ERP	.550	.123	.550	4.457	.000
ORP	.076	.106	.076	.718	.477
CRP	.089	.116	.089	.762	.450
PRP	.243	.127	.243	1.918	.042

a. Dependent Variable: Banks EP

Source: The author's calculations.

According to Table 4.9, the results show a significant positive impact of the bank's employee-related practices on the bank's environmental performance ($\beta = 0.550$, $p = 0.000 < 0.05$). There is a significant positive impact of bank policy-related practices on the banks' environmental performance ($\beta = 0.243$, $p = 0.042 < 0.05$). However, it indicates that there is no significant impact of bank's operational-related practices and bank's customer-related practices on the bank's environmental performance.

The findings of the study align with several empirical evidences. The current study demonstrates that there is a significant positive impact in between bank's employee-related practices and banks' environmental performance. For instance, a research conducted in Kathmandu valley complements the finding that employee-related practice had a significant impact on banks' environmental performance (Nischal & Joshi, 2018). Moreover, as per Vidyakala (2020), employee-related practices have a significant impact on a bank's environmental performance. In contrast, according to Chen et al. (2022), the bank's employee-related practices did not have a significant positive effect on its environmental performance.

The study found that the impact of operational-related practices on banks' environmental performance is insignificant among the selected banks in Sri Lanka. However, the finding contradicts several previous studies, such as Nischal and Joshi (2018), which found a significant impact of a bank's operations-related practices on its environmental performance. Furthermore, Chen et al. (2022) evidence that the bank's operational-related practices have a significant positive effect on the bank's environmental performance.

According to the current study, there is no significant impact of banks' customer-related practices on banks' environmental performance. Similarly, the study conducted by Nischal and Joshi (2018) found that customer-related practices did not impact the bank's environmental performance. Furthermore, according to Chen et al. (2022), the bank's customer-related practices did not have a significant effect on its environmental performance. Moreover, Gulzar et al. (2024) found that banks' customer-related practices did not significantly or directly impact the environmental performance in India.

The current study found a significant positive impact of banks' policy-related practices on their environmental performance, consistent with the findings of Nischal and Joshi (2018) and Chen et al. (2022). It is further evident in the study conducted by Vidyakala (2020), which examined the effect of banks' policy-related practices on their environmental performance in Coimbatore, India.

5. Conclusion

This study examined the impact of green banking practices on banks' environmental performance, with particular reference to the Colombo District of Sri Lanka. The study was motivated by an identified empirical gap concerning the relationship between specific dimensions of green banking practices and banks' environmental performance. Based on the empirical analysis, the findings indicate that employee-related and policy-related practices have a positive and statistically significant impact on banks' environmental performance. In contrast, bank operational-related practices and customer-related practices do not have a statistically significant impact on banks' environmental performance within the context of this study.The findings provide important insights into the current adoption and implementation of green banking practices within the Sri Lankan banking sector. Although green banking has the potential to improve environmental performance, the findings suggest that the implementation and effectiveness of different green banking practices may vary across dimensions. In particular, the significant effects of employee-related and policy-related practices highlight the importance of employee awareness, participation, organisational commitment, and formal environmental policies in improving banks' environmental performance. Therefore, banks should strengthen their internal environmental policies and ensure that employees are adequately informed, trained, and encouraged to participate in green banking initiatives.

The study also provides practical implications for bank managers, policymakers, academics, researchers, and other stakeholders. Banks can develop targeted green banking strategies that are aligned with their long-term sustainability objectives. Particular attention can be given to initiatives such as paperless transactions, electronic documentation, energy-efficient operations, digital banking services, and environmentally responsible resource management. Although operational and customer-related practices were not statistically significant in this study, these practices remain relevant components of a broader green banking strategy and may require greater awareness, effective implementation, and organisational support to generate measurable environmental outcomes. Overall, the findings highlight the potential of green banking practices to support the environmental sustainability objectives and broader sustainable development goals.

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CHAPTER THREE

The Determinants of Tax Evasion Intention among Sri Lankan Small and Medium-Sized Enterprises: Theory of Planned Behaviour Perspective

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Abstract

This study investigates the factors influencing tax evasion intentions (TEI) among SMEs in the Gampaha District of Sri Lanka, guided by the theory of planned behaviour. A quantitative research approach was employed, utilising a structured questionnaire distributed to 99 SME owners in the Gampaha district, selected through convenience sampling. Data analysis was conducted using Pearson correlation coefficients to identify relationships among the variables, followed by multiple regression analysis to determine the predictive power of each independent variable on TEI. The multiple regression analysis revealed that the model accounted for a remarkable 99.2% of the variance in TEI ($R^2 = 0.992$). Results revealed that Tax Morale, Tax Knowledge and Tax Fineness proved to have a significant negative relationship with TEI. In contrast, Tax Complexity, Tax Corruption, and Tax Power of the Authority showed strong positive correlations with TEI, indicating that they help bridge research gaps regarding ongoing tax policy changes and the critical impact of various determinants of tax evasion.

Keywords: *SME's, Sri Lanka, Tax evasion intention, Theory of planned behaviour.*

1. Introduction

Tax revenue is particularly important for a developing economy such as Sri Lanka because it finances public services, infrastructure and broader economic and social development (Dissanayake & Premaratna, 2020; Anojan, 2014; Bird et al., 2008). The importance of effective revenue mobilisation is heightened by the substantial role of SMEs in the Sri Lankan economy: SMEs contribute materially to output, employment, regional development and poverty reduction (Kulasinghe et al., 2018). Their economic significance means that tax compliance within this sector has direct implications for the sustainability of the domestic revenue base. Nevertheless, Sri Lankan evidence on SME tax behaviour remains limited, and

existing studies have largely examined tax compliance or a restricted set of determinants, including studies conducted around the COVID-19 period (Dissanayake & Damayanthi, 2024; Dissanayake & Premaratna, 2020). Examining tax evasion intention among SMEs is therefore important for understanding behavioural factors that may constrain revenue mobilisation and for informing tax administration and policy directed at this economically significant sector.

Against this background, Sri Lanka's revenue-mobilisation challenge makes SME tax behaviour especially relevant. Developing countries generally collect lower tax revenues relative to GDP than high-income countries, while institutional quality, corruption, voice and accountability can materially influence tax effort (Bird et al., 2008; Fuest & Riedel, 2009). Tax evasion can therefore further weaken an already constrained domestic revenue base. Prior research identifies a range of behavioural and institutional influences on tax evasion, including education and tax knowledge, tax morale, perceived fairness, corruption and characteristics of the tax system (Al-ttaffi et al., 2011; Owusu et al., 2021; Dissanayake & Damayanthi, 2024). However, findings are not always consistent across contexts, strengthening the case for examining these determinants specifically among Sri Lankan SMEs.

Further, tax revenue declined by 31.97% in 2020 compared with the previous year, with tax-policy changes and the COVID-19 pandemic identified as major contributors to the decline (Inland Revenue Department, 2020). Although tax revenue subsequently recovered, revenue mobilisation remained a significant policy concern. The Inland Revenue Department (2022) also reported substantial outstanding income-tax-related amounts, reinforcing the continuing importance of tax compliance and enforcement in Sri Lanka.

The majority of tax evasion investigations occurred in the first part of 2020 (Sadjiarto et al., 2020; Wijerathna & Perera, 2020; Sadesango et al., 2020). However, frequent tax policy changes are common in Sri Lanka, and the aim is to generate and increase government tax revenue (Anojan, 2024). Furthermore, these tax policy changes can positively affect tax compliance (Bandara & Weerasuriya, 2021). According to statistics from the Inland Revenue Department, small and medium-sized firms are subject to corporation tax in tax calculations. The standard rate of Income Tax is increased to 30% from 14% on October 1st 2022. That is, it removed the concessional 14% tax policy for small and medium-sized businesses that existed before October 1, 2022. Hence, under the new policy, SMEs contribute significantly to tax revenue. However, the conclusions of the above-mentioned past studies on tax evasion, the influence of taxpayers' perceptions seems to be crucial in the final result among the investigated factors. Thus, the objective of this study is to explore the factor affecting of taxpayers' tax evasion intention. Moreover, tax policies exhibit inherent dynamism,

undergoing alterations annually. These modifications exert influence on taxpayers' perceptions of tax evasion, potentially inducing both positive and negative shifts in their intentions. However, a research void currently exists concerning the impact of the most recent tax policy adjustment on taxpayer behaviour. The current study aims to address this gap in the existing literature.

2. Literature Review

2.1. Theoretical Review

Several theories have been used to explain tax evasion and compliance, including economic deterrence theory, equity theory, psychological contract theory, the fear of God perspective, and the Theory of Planned Behaviour (TPB).

According to economic deterrence theory, taxpayers are considered economically rational and would evade taxes as long as the reward exceeds the expected enforcement cost. According to this hypothesis, taxpayers frequently do cost-benefit analyses on crime (Hasseldine & Bebbington, 1991). As such, this theory emphasises the role of risk and rewards but cannot fully explain tax evasion in all contexts. Next, equity theory is a motivational theory proposing that employee motivation at work is primarily influenced by a sense of justice. According to equity theory, tax evasion can arise when taxpayers perceive that one neighbourhood in the state has better socioeconomic conditions than another (Mohammed et al., 2020). While equity theory thus provides a framework for understanding equity-based tax evasion, it may not fully account for individual differences and psychological effects. Also, the psychological contract theory emphasises the importance of the contract in the relationship between taxpayers and the government, in which taxpayers provide income in exchange for government services (Scholz, 2003). Hence, this theory highlights the importance of trust and reciprocity, but its applicability may be more limited than other theories. In addition, the fear-of-God theory posits a link between religious beliefs and morality. Values can influence tax-evasion intentions (McGee, 2006). Thus, the fear-of-God theory addresses the influence of moral and religious beliefs, but its applicability may vary across cultural contexts.

The current research employs the TPB as its framework for investigating tax evasion intentions. Further, the TPB appears to be a strong framework for investigating tax evasion intentions due to its focus on intentions, its strong empirical base, its incorporation of key psychological constructs, and its adaptability. Also, it provides valuable insight into the motivations of individuals to evade taxes. Ajzen (1991) established the TPB, which is a significant social theory that aims to explain psychology and human behavior. Only an

enhanced version of the idea was proposed by Ajzen and Fishbein (1970). Additionally, Ajzen and Fishbein (1980) said that TPB is an extension of the theory of reasoned action (TRA). The theory of planned behaviour proposes three independent drivers of intention. These are attitudes, subjective norms, and perceived behavioural control. These three components influence tax evasion intentions and compliance. Attitude towards a behaviour influences an individual's disposition and appraisal, with a favourable attitude and larger perceived behavioural control resulting in a stronger desire to perform the behaviour (Ajzen, 2020). The second component is a subjective standard. This relates to perceived social pressure to engage in a behaviour, which is impacted by two forms of normative beliefs: injunctive and descriptive (Fishbein & Ajzen, 2010). Perceived behavioural control, perceived ease or difficulty, and control belief are factors influencing intention. Positive attitudes and supportive norms lead to positive behavioural intentions, and people are expected to follow through on those intentions when they have control over performance (Ajzen, 2020). According to this, the theories of equity, economic deterrence, psychological contract, and fear of God provide important insights into the complex nature of tax evasion, and their combination highlights elements such as equity, social exchange, and moral responsibility. Moreover, the TPB theory covers the critical dimensions that lead to TEI behaviour through components such as attitude towards behaviour, subjective norms, and perceived behavioural control, and offers a more relevant explanation for the complex interactions between the variables.

In addition, the TPB is founded on intention, which is the level of individual effort required to conduct a behaviour. However, empirical research on the notion of planned behaviour is limited (Chang, 1998; Allen, 2004). TPB explains tax determinants, which are organised into three major components. If there exist attitudes (tax morality and tax knowledge), individual norms (tax corruption, tax complexity, and tax fairness), and perceived behavioural control (tax authority power). As a result, this study will provide a comprehensive understanding of the link between the aforementioned factors and taxpayers' intention to engage in tax evasion.

2.2. Empirical Review

The concept of tax revenue was defined by Anojan (2014) as a major source of revenue for every government. While infrastructure development is essential and unavoidable due to the ongoing process of urbanisation in the majority of developing nations, development-oriented services like education, training, social development, agricultural extension, and research are given priority by developing governments. As the private sector also plays an essential role in developing countries, a government has to shoulder this expenditure alone (Bird et al., 2008). Therefore, as the government's income is dependent on tax revenue, as a developing country,

special attention should be given to tax revenue. According to Anogen (2014), he mentioned that tax revenue is only 85% of Sri Lanka's total revenue. The government also uses taxation as a powerful weapon to discourage other illegal activities and discourage the production of drugs and tobacco. So, Nisha (2018) has said that the government collects tax revenue, which is important for these economic and social developments, through the taxes it imposes.

According to Khan (2014), taxes are monetary contributions made by the general population. However, the Organisation for Economic Co-operation and Development defines a "tax" as a compulsory payment to the government. Furthermore, paying taxes is essential; yet, tax avoidance in violation of tax regulations is considered an unlawful conduct. Akdede (2006) defined tax evasion as the act of a taxpayer failing to pay taxes to the tax authorities. Thus, tax evasion is considered a corrupt behaviour. Sri Lanka has a high level of tax avoidance. According to Wijerathna and Perera (2019), tax collection is a principal source of government revenue, and tax evasion is a major problem in developing countries such as Sri Lanka. As a result, more research has been conducted in developing nations to explore tax evasion than in industrialised countries. Similarly, Fuest and Riedel (2009) argue that tax income is vital to economic progress, but many developing nations fail to raise it. In 2005, affluent countries had an average tax revenue ratio of 35% of GDP, compared to 12% in low-income countries. As such, tax evasion is an important factor limiting revenue mobilisation (Fuest & Riedel, 2009). However, Campbell (2022) notes that tax evasion and avoidance are common in both wealthy and poor countries. Furthermore, financial shortage has been noted as a persistent issue in several nations, including Sri Lanka. Although there are numerous approaches to addressing budget deficits, tax revenue is the most effective (Amirthalingama, 2013). According to the tax evasion is a disputed issue, particularly in poorer countries. Lowering tax evasion requires lowering the black and hidden economies. Thus, tax evasion is an issue that should be addressed in developing nations such as Sri Lanka.

In Malaysia, SMEs are defined as enterprises with annual revenue of RM25,000 to RM250,000 or more than 150 workers (Chong et al., 2014). However, in Sri Lanka, SMEs are defined as enterprises with fewer than 300 workers and an annual revenue of no more than 750 million rupees (Ministry of Industries and Commerce). Small and medium-sized firms are defined differently in each country. Furthermore, Nishantha and Padmasiri (2010), stated that small and medium-sized firms are important to an economy since they boost numerous economic activities such as employment generation, regional growth, and innovation. In developing nations like Sri Lanka, where unemployment, poverty, and inflation are serious problems, small enterprises are essential. According to Wan (2009), they are estimated to comprise one-third of the economy and have difficulty managing a big number of small businesses. Thus, the problem of tax evasion by SMEs in Sri Lanka is always serious. A study

conducted by Fagariba (2016) showed that many Ghanaians, especially traders and SMEs, willingly or that they willfully refuse to honour their tax obligations. Gahana is a city with a population of over 2.4 million and several small businesses. However, regarding tax avoidance, they claim that their company's profits are insufficient to cover taxes. Given these facts and the rising trend in Sri Lanka's small and medium-sized enterprise (SME) community, this study primarily focused on analysing the triad of tax evasion by SMEs using the TPB.

Tax evasion has been extensively studied worldwide, with a focus on several reasons (Rashid & Ahmed, 2020). Scholars explore how tax-related characteristics such as tax justice, corruption, tax system complexity, and tax knowledge influence Bangladeshi students' opinions of tax evasion. Its results imply a rise in corruption and complexity in the tax system, as well as a decrease in fairness and audit. Tax evasion is more likely to occur when there is a lack of tax expertise. Bima and Andrianantenaina (2020) researchers investigated taxpayers' perceptions of tax evasion using only three criteria: tax knowledge, tax fairness, and tax discrimination. According to Rashid and Int (2020), they have considered factors related to demographic characteristics and tax efficiency (corruption in the tax system, discrimination and tax complexity) as payment factors. Furthermore, the study suggests that taxpayers' attitudes towards tax evasion are unaffected. Moreover, demographic characteristics presented moderating effects, but the direct relationship between demographics was not investigated (Ludigdo & Puspita, 2023). Researchers considered only geographical factors for tax evasion. The conclusions indicate that women are less likely to evade taxes than men, and that the higher the level of education, the less likely they are to evade taxes. Similarly, Ttaffi et al. (2011) have studied tax evasion in Malaysia by taking geographical factors more widely. Islamic-religious perspective, gender, education level, source of income, fines, tax rate, fairness, different age levels, marital status and nature of work are the geographical characteristics used in the study. However, Dewanta and Machmuddah's (2019) study aimed to find taxpayers' moral perception of tax evasion using the criteria of love of money, discrimination, and high religiosity. One conclusion of the results was that high materialism increases the feeling of love for money, and it increases the perception of tax evasion.

However, research on Sri Lankan SMEs has focused on a few limited areas. Dissanayake and Damayanthi (2024) only consider PEST tax exemptions. These are organisational, economic, health-psychological, political and legal. Tax compliance also uses demographic factors when making decisions. Weerawickrama and Thilakasiri (2020) also investigated SMEs' perceptions of tax compliance, including public works and other factors (perception of government responsibility). According to Dissanayake and Premaratna (2020), the influence

of income volatility on tax compliance among small and medium-sized company owners was explored. Taxpayer income is sometimes seen as a mediating variable. Bandara (2018) evaluated the influence of tax compliance on SMEs, focusing on variables such as tax rates, tax information, and people's attitudes towards taxes, earnings, and legal requirements. However, the need to conduct the current study strongly arises due to the inadequate attention given to SMEs in Sri Lanka regarding TEI.

Also, several researchers have already done research on tax evasion in Sri Lanka. But they were in the midst of the economic crisis, and much attention has been paid to the COVID-19 pandemic (Dissanayake & Damayanthi, 2024; Dissanayake & Premaratna, 2020; Kirchler, 2021; Dissanayake et al., 2021). Moreover, research on taxpayer attitudes and compliance has highlighted the need for policymakers to adopt a flexible and adaptable tax policy approach during crises such as pandemics (Gamini & Weerasooriya,2021). But after the tax policy change on October 1, 2022, no research has been done. Furthermore, the change in tax rate had a great impact on SMEs. Moreover, many researchers have conducted tax-related studies based on the TPB theory. But among those studies, many scholars have focused on tax compliance (Nurwanah, 2018; Adhikara et al., 2022; Benk & Budak, 2011). Consequently, within the TPB framework, the current study explores the influence of key factors on taxpayers' tax-evasion intentions in SMEs.

3. Methodology

3.1. Conceptual Framework and Research Hypotheses

Based on the literature and the TPB-based conceptualisation adopted in this study, each explanatory variable is expected to shape tax evasion intention through taxpayers' attitudes, normative evaluations or perceived behavioural control. Higher tax morale reflects a stronger intrinsic commitment to meeting tax obligations and is therefore expected to reduce the intention to evade taxes (Jimenez & Iyer, 2016; Owusu et al., 2021). Greater tax knowledge can improve understanding of tax obligations and the consequences of non-compliance and is consequently expected to reduce the intention to evade (Alleyne & Harris, 2017). Perceived tax fairness can strengthen the legitimacy of the tax system and willingness to comply, suggesting a negative relationship with evasion intention (Bin-Nashwan et al., 2020). In contrast, greater tax complexity can increase compliance costs and uncertainty, and may increase the intention to evade (Akaro, 2023). Perceived corruption can weaken trust in tax institutions and provide justification for non-compliance, suggesting a positive relationship with evasion intention. Finally, the perceived power of the tax authority represents the

enforcement environment and taxpayers' perceived behavioural control; its effect on evasion intention is therefore examined empirically.

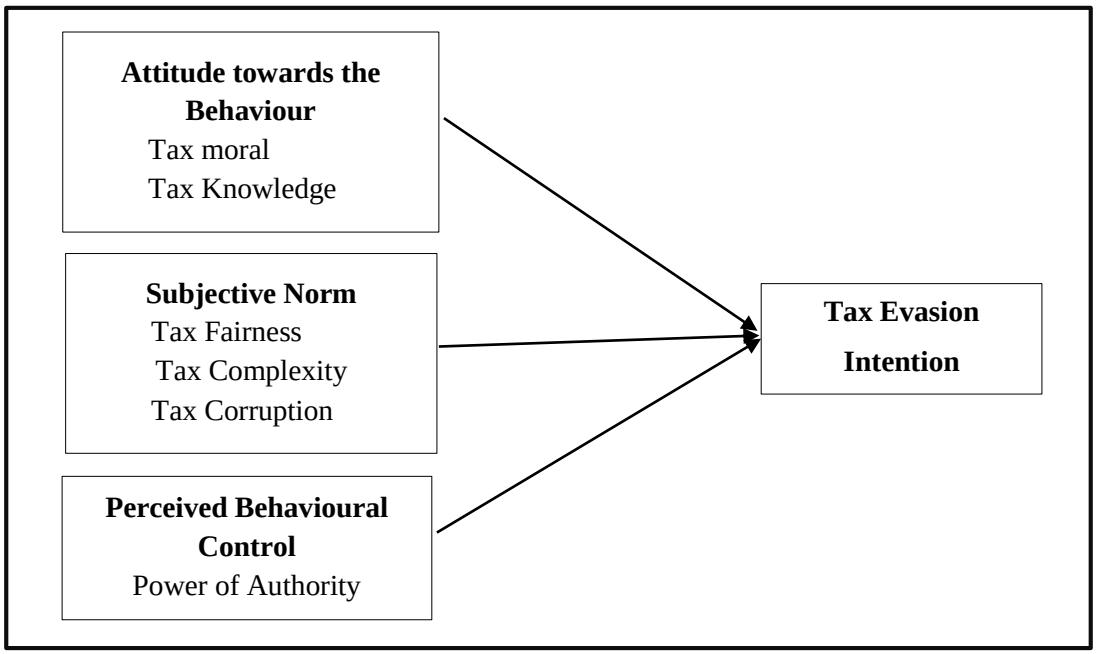


Figure 3.1: Conceptual Framework

Source: Developed by the Author

Figure 3.1 presents the proposed relationships, from which the following hypotheses are developed.

H_1: *There is a significant influence of tax morale on intention to evade taxes.*

H_2: *There is a significant influence of tax knowledge on tax evasion intention.*

H_3: *There is a significant influence of tax complexity on tax evasion intention.*

H_4: *There is a significant influence of Tax Fairness on tax evasion intention.*

H_5: *There is a significant impact of tax corruption on tax evasion intent*ion

H_6: *There is a significant impact of the power of authority on tax evasion intention.*

3.2. Research Design

The quantitative technique was employed since the researcher aim of this study is to evaluate the link between taxpayer Intentions and tax evasion. Also, the research employed a deductive research technique to test an existing hypothesis with new empirical evidence.

A questionnaire was used to collect data for this cross-sectional study. Each construct in this study was evaluated using three– five indicators. This study identified 1118 small businesses in Gampaha District registered with Inland Revenue using a Convenience sampling strategy.

To evaluate taxpayers' views on tax evasion intent, using primary data, the study designed a survey to distribute forms to SMEs through physical meetings. One open-ended question is also provided, demonstrating the validity of the study's conclusions.

Data were analysed using SPSS, applying multiple regression analysis to test the hypothesis, Sri Lanka, and collected data from 99 medium-sized entrepreneurs regarding the relationships between Tax Morale, Tax Knowledge, Tax System Fairness, Tax Complexity, Tax Corruption, Tax Power of the Authority and tax evasion intentions.

4. Results and Discussion

4.1. Reliability

The reliability of the scales used in the study was evaluated using Cronbach's Alpha, a statistical metric commonly used to detect internal consistency, or how closely a group of items are related. Further, Table 4.1 below presents Cronbach's alpha values for each construct, along with their interpretation relative to this threshold.

Table 4.1: Reliability

Scale	Cronbach's Alpha	Number of Items (N of Items)
Tax Morale (TM)	0.754	5
Tax Knowledge (TK)	0.734	5
Tax system fairness (TF)	0.937	5
Tax complexity (TC)	0.714	4
Tax Corruption (TCR)	0.960	3
Tax Power of the Authority (TPA)	0.942	5
Tax Evasion Intention (TEI)	0.918	4

Source: Survey Data (2024)

Table 4.1 shows the results of reliability analysis conducted for six independent variables and one dependent variable. It is concluded that Cronbach's alpha value of all scale is more than 0.7. Thus, Cronbach's alpha of all scales is above the acceptable limit of 0.7, and internal consistency of all scales used to assess is reliable and accurately reflects the underlying concept. Furthermore, tax corruption has an extraordinarily high Cronbach's Alpha of 0.960, suggesting excellent internal consistency. The tax corruption scale contains only three items, indicating that the issues are closely related and effectively assess the same underlying idea.

4.2. Validity

In order to assure the validity of the current study, the researcher considered the content validity, face validity, convergent validity and discriminant validity.

Table 4.2: KMO and Bartlett's Test of Sphericity.

Variable/Scale	KMO Measure	Bartlett's Test of Sphericity.
Tax Morale	0.559	.000
Tax Knowledge	0.572	.000
Tax Fairness	0.757	.000
Tax Complexity	0.731	.000
Tax Corruption	0. 777	.000
Tax Power of the Authority	0.869	.000
Tax Evasion Intention	0.662	.000

Source: Survey Data (2024)

Table 4.2 provides two important statistical measures for analysing sample adequacy in factor analysis: the Kaiser-Meyer-Olkin (KMO) value and Bartlett's Test of Sphericity. The KMO values range from 0.559 to 0.869, suggesting that the data is suitable for factor analysis. Values above 0.5 are generally considered acceptable, indicating that the data is valid for the statistical analysis. Specifically, the variable Tax Power of the Authority has the highest KMO value, 0.869, indicating strong sampling adequacy for this scale. Further, the Bartlett's Test of Sphericity p-value for all variables is 0.000, indicating that the test is highly significant and that factor analysis is appropriate.

Following the collection of data, the researcher assessed both discriminant and convergent validity. Table 4.3 shows that the Average Variance Extracted (AVE) values for each variable are greater than 0.5. Hence, the convergent validity is verified. Further, this table illustrated composite reliability (CR) for each variable is also greater than 0.7. Therefore, it can be clearly shown that all the variables are internally consistent.

Table 4.3: Convergent Validity

Variable	AVE	CR	Status
Tax Morale	0.653	0.872	Accepted
Tax Knowledge	0.871	0.866	Accepted
Tax Fairness	0.863	0.866	Accepted
Tax Complexity	0.866	0.848	Accepted
Tax Corruption	0.747	0.843	Accepted
Tax Power of the Authority	0.823	0.868	Accepted
Tax Evasion Intention	0.779	0.854	Accepted

Source: Survey Data (2024)

The square root of the AVE should be greater than the off-diagonal values and substituted for the diagonal values in the correlation matrix to ensure discriminant validity. Table 4.4 demonstrates that discriminant validity is guaranteed.

Table 4.4: Discriminant Validity

Variables	TM	TK	TF	TC	TCR	TPA	TEI
TM	0.808						
TK	0.215*	0.933					
TF	0.039	-0.798**	0.928				
TC	-0.552**	-0.680**	0.240*	0.93			
TCR	-0.407**	-0.424**	-0.118	0.605**	0.864		
TPA	-0.582**	-0.461**	-0.061	0.902**	0.801**	0.907	
TEI	-0.532**	-0.485**	-0.061	0.802**	0.816**	0.859**	0.882

Source: Survey Data (2024)

4.3. Descriptive Statistics

Table 4.5 presents descriptive statistics to summarise the central tendency, dispersion and distributional characteristics of the study variables before examining their relationships. The mean indicates the average response for each construct; the standard deviation shows the extent of variation among respondents; and skewness and kurtosis indicate the shape of each variable's distribution.

Table 4.5: Descriptive Statistics

Variables	Mean	Std. Deviation	Skewness	Kurtosis
TM	1.8081	.64960	1.894	-.957
TK	2.2303	.78108	.287	-.681
TF	3.7515	1.13788	-.590	-.242
TC	3.8434	.92208	-.771	-.426
TCR	3.7980	1.28908	-.901	-.523
TPA	3.8687	1.13251	-.770	-.694
TEI	3.8434	1.14263	-.699	-.957

Source: Survey Data (2024)

Tax Morale (TM) has a relatively low mean of 1.81, indicating that respondents generally report low morale, with a high positive skewness (1.89) and high kurtosis (4.48). Tax Knowledge (TK) has a moderate mean of 2.23 and is more normally distributed with lower skewness (0.29) and negative kurtosis (-0.96), indicating a balanced distribution of knowledge levels. Tax Fairness (TF) and Tax Complexity (TC) have higher means of 3.75 and 3.84, respectively, reflecting that respondents perceive the tax system as moderately fair and complex. Both variables have slight negative skewness, suggesting that a majority of respondents rate fairness and complexity on the higher end. Tax Corruption (TCR), Tax Power of Authority (TPA), and Tax Evasion Intention (TEI) all exhibit means around 3.80,

indicating moderately high perceptions of corruption, authority power, and intention to evade taxes, with a consistent slight negative skewness. The standard deviations suggest moderate variability across responses, with Tax Corruption (TCR) showing the largest spread (1.29) and Tax Morale (TM) the least variability (0.65).

4.4. Correlations Analysis

As shown in Table 4.6 below, the correlation analysis highlights significant relationships between tax evasion intention (TEI) and various tax compliance factors.

Table 4.6: Correlations Analysis.

Variables	TM	TK	TF	TC	TCR	TPA	TEI
TM	1						
TK	0.215*	1					
TF	0.039	-0.798**	1				
TC	-0.552**	-0.680**	0.240*	1			
TCR	-0.407**	-0.424**	-0.118	0.605**	1		
TPA	-0.582**	-0.461**	-0.061	0.902**	0.801**	1	
TEI	-0.532**	-0.485**	-0.061	0.802**	0.816**	0.859**	1

Source: Survey Data (2024)

***.** Correlation is significant at the 0.05 level (2-tailed).

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

A strong negative correlation of -0.532 exists between Tax Morale (TM) and TEI, which is statistically significant ($p < 0.01$). This finding suggests that individuals with a higher sense of obligation to pay taxes are less likely to consider evading them. Similarly, the negative correlation of -0.485 between Tax Knowledge (TK) and TEI ($p < 0.01$) indicates that greater awareness of tax responsibilities is associated with a lower intention to evade taxes; individuals who understand their tax obligations are less inclined to consider evasion.

In contrast, the correlation between Tax System Fairness (TF) and TEI is -0.061, which is not statistically significant ($p > 0.05$). This implies that perceptions of fairness in the tax system do not have a meaningful impact on intentions to evade taxes, suggesting that other factors may be more influential in shaping individuals' behaviors. Conversely, Tax Complexity (TC) shows a significant positive correlation of 0.802 with TEI ($p < 0.01$), indicating that as tax complexity increases, intentions to evade taxes also rise. This relationship highlights how complicated tax regulations can lead to confusion, prompting individuals to consider evasion as a way to navigate a challenging system.

Moreover, Tax Corruption (TCR) demonstrates a strong positive correlation of 0.816 with TEI ($p < 0.01$), suggesting that perceptions of corruption within the tax system are associated with heightened intentions to evade taxes. The intensity of tax evasion can be reduced by increasing the transparency of tax officials and government activities. Otherwise, a non-transparent tax collection process creates more opportunities to justify or evade tax non-payment. Similarly, the correlation between Taxation Authority (TPA) and TEI is 0.859 ($p < 0.01$), indicating a very strong positive relationship. This indicates that the strict rules and penalties of the tax authorities lead to tax evasion by taxpayers.

4.5. Regression Analysis

Multiple regression analysis is followed to determine the predictive power of each independent variable on TEI in this study. In term of model summary shows a significant predictive association between the independent variables and Tax Evasion Intention (TEI). It is shown in detail by Table 4.7. The correlation coefficient (R) is 0.996, showing a very strong association between the predictors and the dependent variable. The R-squared score is 0.992, indicating that the model's predictors account for about 99.2% of the variation in TEI. The adjusted R-squared value of 0.992 indicates that the model fits the data remarkably well, given the number of predictors utilized. The standard error of the estimate is 0.10397, which is the average distance between the observed values and the regression line.

Table 4.7: Model Summary

Model	R	R Square	Adjusted R-Square	Std. Error of the Estimate
1	.996[a]	.992	.992	.10397

Source: Survey Data (2024)

The coefficient analysis in Table 4.8 shows the unstandardized and standardized coefficients for each predictor in the model, along with their significance levels.

Table 4.8: Coefficients Analysis

Model		Unstandardized Coefficients		Standardized Coefficients	Sig.
		B	Std. Error	Beta	
1	(Constant)	-.639	.328		.054
	TM	-.050	.021	-.029	.018
	TK	-.580	.077	-.397	.000
	TF	-.155	.037	-.155	.000
	TC	.698	.062	.564	.000
	TCR	.129	.028	.145	.000
	TPA	1.152	.049	1.141	.000

Source: Survey Data (2024)

The constant term is -0.639, implying that when all predictors are at zero, TEI will be negative, which may not have practical interpretation in this scenario. Tax Knowledge (TK) had the greatest negative influence on TEI, with a coefficient of -0.580 and a standardised beta of -0.397, showing that increased tax knowledge is related with a large drop in tax evasion intention. Tax Morale (TM) likewise has a negative effect on TEI, with a coefficient of -0.050, which is significant at the 0.018 level. This suggests that those with a stronger sense of tax responsibility are less inclined to avoid taxes.

Tax Complexity (TC) has a positive coefficient of 0.698, suggesting that as tax complexity increases, the intention to evade taxes also rises significantly. This is further supported by its standardised beta of 0.564. The coefficient for Tax Corruption (TCR) is 0.129, indicating that perceptions of corruption in the tax system are positively associated with TEI. The standardised beta of 0.145 shows a moderate impact. Finally, Tax Power of the Authority (TPA) exhibits the strongest positive relationship with TEI, with a coefficient of 1.152 and a standardised beta of 1.141. This suggests that perceptions of strong enforcement by tax authorities significantly influence the intention to evade taxes, making it the most impactful predictor in this model. Overall, the findings indicate that improving taxpayers' confidence in government and tax officials, enhancing tax knowledge and morale, while simplifying the tax system can effectively reduce tax evasion intentions.

Regression Equation:

$$\mathbf{TE=\beta_0+\beta_1 \cdot TM+\beta_2 \cdot TK+\beta_3 \cdot TF+\beta_4 \cdot TC+\beta_5 \cdot TCR+\beta_6 \cdot TPA+e} \quad (01)$$

Where:

TE= Dependent Variable (Tax Evasion)
TM = Tax Morale
TK = Tax Knowledge
TF= Tax System Fairness
TC = Tax Complexity
TCR = Tax Corruption
TPA = Tax Power of the Authority
β0 = Constant (intercept)
β1, β2, β3, β4, β5, β6 = Coefficients for each independent variable
e = Error term

Substituting the regression output coefficients into the estimated equation:

$$\mathbf{TEI=-0.639-0.050(TM)-0.580(TK)-0.155(TF)+0.698(TC)+0.129(TCR)+1.152(TPA)+e}$$

This equation expresses how each independent variable influences the intention to evade taxes. The negative coefficients indicate a decrease in tax evasion intention as the respective independent variables increase, while the positive coefficients indicate an increase in tax evasion intention.

Table 4.9: Hypothesis Testing

Hypotheses	Regression Analysis				Result
	Beta	Impact	Significance		
H_1: Tax Moral has an impact on Tax Evasion Intention in Sri Lankan SMEs.	-0.050	Negative	.018	Significant	Accept
H_2: Tax Knowledge has an impact on Tax Evasion Intention in Sri Lankan SMEs.	. -0.580	Negative	.000	Significant	Accept
H_3: Tax Fairness has an impact on Tax Evasion Intention in Sri Lankan SMEs.	-0.155	Negative	.000	Significant	Accept
H_4: Tax Complexity has an impact on Tax Evasion Intention in Sri Lankan SMEs.	0.698	Positive	.000	Significant	Accept
H_5: Tax Corruption has an impact on Tax Evasion Intention in Sri Lankan SMEs.	0.139	Positive	.000	Significant	Accept
H_6: Tax Power of the Authority has an impact on Tax Evasion Intention in Sri Lankan SMEs.	1.152	Positive	.000	Significant	Accept

Source: Author Constructed

4.6. Discussion

Tax evasion remains a global problem, with serious consequences for public income and economic stability. This study investigated the many elements that influence TEI among SMEs in Sri Lanka. To achieve this objective, six hypotheses were formulated with the help of relevant literature. The findings emphasise that the Tax morale, Tax knowledge, Tax system fairness, Tax complexity have a significant impact on Taxpayer's Tax evasion intention. So, all the hypothesis is accepted. Moreover, the data imply that improving taxpayer compliance.

The findings show a substantial negative association between TM and TEI, confirming the hypothesis that a strong feeling of duty among taxpayers might inhibit tax cheating. Previous study indicates that tax morale is impacted by societal norms, perceived justice, and the interaction between taxpayers and authorities (Jimenez and Iyer, 2016). This study supports Braithwaite's (2017) argument that fostering intrinsic motivation via a commitment to social equality and fairness can successfully minimize tax evasion. Godfred's (2022) study discovered a substantial link between personality factors and taxpayer behavior. Individuals with greater degrees of agreeableness, conscientiousness, and openness to experience were more likely to follow tax regulations and properly record their income. On the other side, individuals who were more likely to engage in tax evasion scored lower on these personality qualities. This is also consistent with the findings of the current investigation.

The strong negative effect of TK on TEI highlights the need for taxpayer education. According to the research, those who are more aware of their tax duties are less likely to evade them (Alleyne & Harris, 2017). Bima and Andrianantenaina (2020) support the present study's findings, claiming that taxpayers with higher levels of education may have a better awareness of tax regulations and, as a result, be more proficient at tax evasion and partaking in it. However, according to this analysis, a lack of clarity in tax legislation in Sri Lanka contributes to widespread noncompliance.

The study revealed a nuanced relationship between TF and TEI, where perceived fairness significantly reduces intentions to evade taxes. This finding aligns with the fairness theory, which posits that taxpayers' perceptions of the justice of tax systems influence compliance behaviour (Bin-Nashwan et al.,2020). Similar to current research findings, Susan et al. (2022) suggests that the perception of unfair taxation is a stronger predictor of tax evasion than increasing tax rates or income levels. Policymakers must strive for transparency and equitable application of tax laws to bolster public confidence in the system.

The strong positive correlation between TC and TEI highlights a crucial barrier to compliance. This finding corroborates findings from research conducted in various contexts, indicating that convoluted tax systems often lead to confusion and unintentional non-compliance (Akaro, 2023). Prianto (2024) confirmed the findings of this study, demonstrating a strong correlation between the time and cost of tax compliance and the prevalence of tax evasion among businesses. The study's benchmark regression results were confirmed using rigorous endogeneity analysis and many robustness tests. Prianto's heterogeneity analysis also found that tax complexity has a particularly strong influence on chronic tax evasion in low- and lower-middle-income nations, as well as in the primary industry. Simplifying tax

procedures and offering clear instructions may greatly reduce taxpayer costs, hence increasing compliance rates.

The positive correlation between TCR and TEI underscores the detrimental effect of corruption on taxpayer compliance. Research has shown that widespread corruption within tax authorities leads to a loss of trust in the system, further encouraging evasion (Torgler & Valev, 2010). James et al. (2016) also confirm that a more corrupt environment can increase tax evasion, as corrupt officials can obtain additional income through bribery. On the other hand, they suggest that higher rates of tax evasion may create more opportunities for bribery, leading to further corruption.

The strong positive relationship between TPA and TEI raises important issues regarding tax authorities' enforcement practices. Strict enforcement can be tax-evasive and create resentment and resistance among taxpayers. Especially when viewed as punitive rather than supportive (da Silva et al., 2019). The findings of Barbara et al.'s (2015) study diverge from the present results. They observed that when the tax authority was considered to have less coercive power, a loss in legal power resulted in a higher rate of tax evasion than in the control group. That is, he contended that there is a negative correlation between tax evasion and tax power. However, according to Yenni et al. (2020), tax responsibilities should be enforced autonomously rather than through coercive methods such as penalties or tax audits to ensure compliance. This idea is consistent with the outcomes of the current investigation.

4.7. Respondents' Point of View on the Existing Tax System

Table 4.10: Different views of the respondents on the existing tax system

Criteria	Respondents' Criticisms.
Economic crisis	• It is difficult with our economic situation to bear the high tax burden. • Due to less business, it is difficult to bear high tax rates. (Jewelry shops). • If two tax files are opened for two people in the house, it will be difficult to pay due to the economy.

	• Tax evaders should be punished publicly. • Lack of awareness of whether there are penalties for tax evaders and whether they will be implemented.
Poor Awareness of Tax Knowledge	• Lack of awareness among taxpayers as to why taxes should be paid. • Existence of weaknesses in the implementation of tax laws. (It was further said that there is still failure to punish a company that has committed tax evasion.)
Inefficiency of Tax System	• The tax laws do not apply to major business owners. • Only small business owners subject to the tax law's stringent enforcement. • Well-known businessmen spend money on various campaigns (political programs) and are exempted from tax burden. • Treating the tax law in two different ways according to the social status of the tax holders. • Taxation of same goods at multiple places. (Taxation of a same goods at multiple places like manufacturer, wholesaler and middlemen etc) • Tax payment is a complex process that is not as straightforward as paying other expenses like Utility bills. • The tax process is not so simple that it can be understood by all the educated and the ignorant. • Additional costs and time are incurred as the tax payment process is done under someone else. • If the tax system is fair to all rather than strict tax laws, tax compliance will occur. (Even if a child is punished, he becomes stubborn.) • A taxpayer opening a tax file for the first time lacks a good guide for this complex process.
Lack of Transparency of Tax Officials	• According to frauds among tax officials during tax collection, not only non-payment of tax but also payment of tax is a crime • According to experiences, there have been several cases where the tax officials demanded bribes when they could not pay the taxes. • Tax fraud is common at tax collection centers. (Inland revenue Department, Customs Department, Excise

	Department) • The then government to merge three tax collection office a failed. Although the Inland Revenue Department and the Excise Department agreed with this measure taken by the government to reduce tax fraud, the Customs Department opposed it. The main reason is tax corruption in the highest customs department. (Garlic Scam, Sugar Tax Scam.)
Weakness in Government Performance	• The government does not use the collected tax money properly for the development of the country • Tax rates are higher in foreign countries but the development of the country is equally high. • Recently Australia has increased tax rates and set them aside for the over 60s. However, the Government of Sri Lanka does not have any such program. • The collected tax money is used by the government for various political purposes. (The proposed road project, if realised, will likely be named after the current leader, primarily as a means of political self-promotion.) • They accused that the tax payers should get the any benefits. But there are various benefits for a tax payer as well as the development of the country in foreign countries. • In Australia, the tax money paid is linked to all activities in the name of the respective tax holders. Therefore, even when a tax payer takes a loan, he is entitled to Priority. • Hospitals in Australia are incredibly comfortable. But Government hospitals still have very long queues. Furthermore, it is not comfort.

Source: Author Constructed

The above Table 4.10 shows the various criticisms made by the tax players who participated in this investigation on the tax system. The findings of this investigation are further confirmed by these responses. This criticism highlights some burning issues especially regarding the economic situation of Sri Lanka. A major problem is the heavy tax burden, which disproportionately affects small businesses like jewelry shops. They point out that due to the decrease in business activities due to the current economic difficulties, it is difficult for them

to bear this unlimited tax burden. They pointed out that is struggling endlessly to meet his tax obligations.

This investigation reveals that individuals with higher tax knowledge are less likely to intend to evade taxes. That point is clear from these interpretations. This suggests that a lack of public awareness about tax obligations, their importance for national development, and the consequences of evasion is a significant factor driving tax non-compliance. Weak enforcement and a perceived lack of consequences for tax evaders further undermine public trust in the tax system.

Another thing is that the tax system is considered very inefficient and unfair. This was a matter of great displeasure to the tax payers. Large businesses, often backed by political connections, are able to avoid taxes, while small businesses are subject to strict enforcement. Furthermore, there is an issue of double taxation, where the same goods are taxed at multiple stages, from manufacturing to wholesale. A simplified, fairer system could encourage better compliance among taxpayers. And the research results show apositive relationship between tax complexity and tax evasion intention. Acknowledging this, they point out that the complexity of the tax process adds more challenges as it is difficult for many people to understand, requires third-party assistance, and incurs additional costs and delays.

Another important finding of this investigation is the positive correlation between tax corruption and TEI. This is a very strong factor which was well reflected in the comments of the respondents. Thus, Corruption among tax officials also plays a significant role in undermining the system. There are widespread reports of bribery and tax evasion within tax collection centers, particularly in the Inland Revenue, Customs, and Excise Departments. Efforts by the government to reduce fraud by merging these tax collection centers have failed, largely due to resistance from the Customs Department, which is seen as especially corrupt.

Finally, the government's misuse of tax revenue is a significant issue. While tax rates may be high, there is little visible return in terms of public services or development. Unlike in countries such as Australia, where tax money is used for welfare programs and linked to tangible benefits for taxpayers, in Sri Lanka, tax revenue is often perceived to be used for political purposes. For example, infrastructure projects, when completed, are seen as opportunities for political gain rather than public benefit. This mismanagement leads to public disillusionment, as taxpayers see little improvement in essential services like healthcare, where government hospitals are still overcrowded and under-resourced. These facts reaffirm the relationship between TF and the TEI. Finally, the findings show that the unlimited power of the tax authority affects the intention to evade taxes. It is further confirmed by the comments of these respondents. Because they simply show that punishing even a small child

makes them more stubborn. Overall, the critique calls for a more transparent, equitable, and efficient tax system that restores public trust and ensures that tax money is used for genuine national development.

5. Conclusion

The current study looks at the factors that influence tax evasion intentions among Sri Lankan small and medium-sized firms (SMEs), with a focus on the Gampaha area. This study's theoretical framework is based on the Theory of Planned Behavior. The researcher addressed empirical gaps in the existing literature by adapting a conceptual framework that examines the impact of several independent variables, tax morale, tax knowledge, tax fairness, tax complexity, tax corruption, and the power of the authority on the dependent variable, tax evasion intention. Data were obtained from 99 taxpayers in the SME category using aconvenience sampling approach, which is a non-probability sampling method. In addition to a structured questionnaire, an open-ended question about the general tax system was included to increase the study'sdependability. The acquired data were analysed with SPSS statistical software, and multiple regression analysis was used to evaluate the hypotheses.

The study's findings show that all independent factors have a substantial impact on taxpayers' tax evasion intentions. Tax morale, tax knowledge, and tax justice have been proven to have a negative link with tax evasion intents, but tax complexity, tax corruption, and tax authorities' perceived authority have a positive correlation. These findings are consistent with past research and mirror the feelings of respondents, many of whom voiced discontent with the Sri Lankan tax system and advocated for a fair and transparent structure. Although respondents acknowledged the necessity of paying taxes for the country's future, they expressed frustration over the mismanagement of tax revenues, which has led to a decline in their willingness to pay. Furthermore, many respondents believed that larger businesses could evade taxes more easily, advocating for voluntary compliance rather than strict enforcement. Reports of bribery and corruption in tax collection were also highlighted, further complicating taxpayer attitudes toward the system. The results suggest that a lack of public awareness regarding tax responsibilities and national interests contributes to increased tax evasion. Overall, the findings underscore the urgent need for tax reform in Sri Lanka, as the attitudes of taxpayers indicate significant room for improvement in the current tax system.

Also, this study provides a valuable basis for future research on tax evasion in Sri Lanka. Ultimately, taxpayers can gain a better understanding of their own tax obligations and the consequences of non-compliance, fostering a more informed and responsible approach to tax payments. That is, the current study will help to identify the main factors affecting tax

evasion, identify research limitations and future directions, and promote interdisciplinary research collaborations. However, the report has a significant impact on the TEI of all stakeholders. That is, improving tax morale through community participation and awareness, spreading tax knowledge highlighting the national need to pay taxes, making the penalties for non-tax payers visible, streamlining tax processes to reduce complexity, increasing the public trust in tax authorities and government and addressing corruption perceptions can help improve tax compliance. Hence, the findings are anticipated to influence policy decisions aimed at improving the tax system and fostering a culture of compliance among taxpayers.

There are few limitations can be identified through analysing the present study. As the very first limitation of the current research has used a physical survey method under a quantitative research approach. Hence, future researchers are suggested to use interviews under a qualitative approach to get more accurate responses from the respondents. Also, future researchers are suggested to use different sampling techniques and probability methods to reduce bias. Considering the demographic location, Gampaha district was used as the demographic area of the study, therefore, to generalize the results, future scholars should research in different districts and provinces within the country and other countries. Overall, this study can be done in different ways.

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CHAPTER FOUR

Effect of Environmental, Social and Governance Performance on Financial Performance of Listed Manufacturing Firms in Sri Lanka

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Abstract

Environmental, social, and governance (ESG) performance has become a significant indicator of corporate sustainability and ethical governance, with growing relevance to financial outcomes. This is particularly important as organisations increasingly embrace ESG performance, a marker of commitment to sustainability, social responsibility, and ethical governance practices, with a notable influence on financial outcomes. Thus, this study examines the effect of ESG performance on the financial performance of listed manufacturing firms in Sri Lanka, employing a two-step system generalized method of moments (GMM) model to address the persistence of return on assets (ROA). Quantitative data were drawn from 20 manufacturing firms listed on the Colombo Stock Exchange over nine years, from 2015 to 2023. ESG performance served as the independent variable, ROA as the dependent variable, and firm size as the control variable. Descriptive statistics, correlation analysis, and the two-step system GMM regression were used to analyse the data. The results indicated that environmental performance has a significant negative effect on ROA, while social and governance performance have significant positive effects. These findings suggest that the short-term costs of environmental initiatives can offset profitability, whereas strong social and governance practices enhance financial outcomes. The study offers practical insights for shareholders, investors, regulators, and policymakers seeking to align sustainability commitments with financial performance in Sri Lanka's manufacturing sector.

Keywords: *Environmental performance, Financial performance, Governance performance, Social performance.*

1. Introduction

Integrating environmental, social, and governance (ESG) factors into companies' strategic management has become an essential corporate success factor. ESG performance denotes a company's non-financial performance in capital markets. Responsible investors evaluate a company's success in ESG criteria with its financial performance when making investment choices. Investors and stakeholders are apprehensive about a company's ESG elements to ascertain its financial performance and business practices. Organisations have oriented their mission and vision toward ESG concerns and are shifting to sustainable development. Globally, ESG is replacing CSR for several reasons, including its capacity to evaluate a company's ability to operate profitably, boost investor value, and act as a benchmark for sustainability advancement while enhancing firm performance (Nurdiati et al., 2022). Globally, ESG has progressively replaced corporate social responsibility as the preferred lens for assessing firms' sustainability commitments and their link to profitability. While ESG is a new concept to the world, it should be carefully examined whether it meets the expected outcomes when establishing ESG initiatives, especially in profit-oriented organisations

In Sri Lanka, the Colombo Stock Exchange (CSE) has issued a sustainability guide for listed firms, and an amendment to listing regulations now requires all listed companies to maintain an ESG policy on their website (GRI, 2023). External pressure reinforces this shift: because the European Union is Sri Lanka's second-largest export market, new EU sustainability-related trade requirements are pushing local exporters, including manufacturers, to strengthen their ESG practices to remain competitive (KPMG Sri Lanka, 2024). Comparable regulatory momentum is visible in the United Kingdom and Germany, where governments are incentivising ESG adoption. Despite this momentum, empirical evidence on whether ESG performance actually improves financial performance in Sri Lanka's manufacturing sector remains limited, particularly given that ESG reporting there is still voluntary and industry-specific studies are scarce.

The manufacturing sector carries particular weight in this setting: it accounts for close to 18 per cent of Sri Lanka's GDP, therefore, how these firms manage their environmental, social, and governance responsibilities has consequences that extend beyond individual profitability to the wider economy. Moreover, the studies evident that consumers are inclined to favour businesses that visibly support ESG issues, and manufacturers that adopt more efficient, cutting-edge technologies can lower costs for themselves and their customers while opening access to new, eco-conscious markets (Ahmad et al., 2021).

This gap is significant because manufacturing is a capital and resource-intensive sector where environmental, social, and governance practices carry direct cost and reputational implications, yet its financial performance is highly persistent: past return on assets (ROA) has a strong bearing on current ROA (Goddard et al., 2005). However, a standard panel regression may not appropriately account for this persistence, which risks producing biased estimates of the ESG-financial performance relationship (Arellano & Bond, 1991). The current study addresses that methodological gap using a two-step system generalized method of moments (GMM) model, an approach rarely applied in this context.

Accordingly, this study investigates the effect of environmental, social, and governance performance on the financial performance, measured through ROA, of listed manufacturing firms in Sri Lanka. Specifically, it examines the individual effect of environmental performance, social performance, and governance performance on financial performance. The findings carry practical weight for several groups. For investors and shareholders, understanding how each ESG pillar relates to ROA offers a basis for identifying firms likely to sustain profitability while meeting sustainability expectations, and for anticipating how short-run environmental costs may affect returns. The government can encourage investors, shareholders, and authorities to enhance these initiatives according to global standards like global reporting initiatives (GRI). For regulators such as the Colombo Stock Exchange, the Securities and Exchange Commission of Sri Lanka, and the Central Bank of Sri Lanka, evidence on the financial consequences of ESG performance can inform decisions on disclosure requirements and incentive design as the country works toward its sustainability and export-compliance commitments. For manufacturing firms themselves, the results help clarify where ESG investment is likely to pay off in the near term and where the payoff is longer-horizon, supporting more realistic strategic planning.

2. Literature Review

2.1. Theoretical Review

This study is grounded in signalling theory, legitimacy theory, and stakeholder theory. Signalling theory introduced by Spence (1973) holds that superior financial performance and transparent sustainability disclosure send a positive signal to stakeholders, which is expected to enhance firm performance; annual and sustainability reports that disclose non-financial ESG practices are therefore interpreted as evidence that a business is well managed (Nurdiati et al., 2022). Legitimacy theory offers a complementary perspective, focusing on the relationship between a firm and the society in which it operates: organisations are expected to conform to prevailing social norms and expectations in order to maintain their standing, or

licence to operate (Campbell et al., 2003). Firms disclose environmental and social information partly to justify their activities to the public, since the wider community can influence the allocation of financial and other resources on which the firm depends (Wu & Jin, 2022); sustainability disclosure, under this view, functions as a mechanism through which legitimacy is sought and maintained (School of Accounting, 2021).

Stakeholder theory is identified as a management theory that reflects the complex, numerous groups that can provide input into or have some stake in the accomplishment of business objectives (Freeman, 2021). For this reason, it fosters a more elaborate conception where all stakeholders' engagement in any corporate activities is prioritized besides shareholders. Stakeholder theory states that a business's sustainability entails taking into account its activities' effects on society and the environment in addition to just turning a profit. Hence, tracking and disclosing the business impact on the environment, society, or economy is based on sustainable accounting that uses stakeholder theory (Manalu et al., 2023). In the theory of stakeholders, the sustainability report can also act as an instrument of control by stakeholders over the company's activities and as a factor to be taken into account when allocating financial resources, particularly those related to the principle of responsible investment. The stakeholder theory aims to identify how the representatives of different stakeholders define the company's success. The analysis of ESG papers reveals that strategic management processes increase shareholder value and firm performance. Investors evaluate various signals to judge investments that improve a company's share value. This work also takes some cognisance of signalling theory, arguing that ESG performance depends on publicly available data. ESG score is linked to corporate sustainability performance, and with a high score, investors react accordingly, resulting in higher stock prices and indicating company success. Accordingly, signalling theory, legitimacy theory, and stakeholder theory collectively underpins the theoretical background for examining the relationship between ESG performance and firm performance.

2.2. Empirical Review

Empirical interest in the relationship between ESG performance and financial outcomes has grown considerably, evolving from earlier concepts of sustainability and non-financial reporting toward standardised ESG reporting frameworks (Gupta & Motwani, 2022). Investors increasingly expect comparable, credible ESG disclosures as reporting practices mature, and several governments, including those of Denmark, Malaysia, China, South Africa, and the Philippines, now mandate ESG disclosure for certain firms (Gupta & Motwani, 2022). In developing economies, ESG reporting offers a broader measure of firm performance beyond conventional financial indicators (Gupta & Motwani, 2022), yet studies

from these contexts remain limited relative to developed markets, where most prior ESG-financial performance theory and evidence originate (Belal & Momin, 2009; Nanayakkara et al., 2023).

Firms that adopt ESG practices are commonly reported to benefit from stronger access to capital, cost savings through improved efficiency, better employee engagement and retention, and improved risk management, alongside the reputational gains already noted (Pandey et al., 2023). At the same time, several barriers slow ESG adoption in developing-country settings, including limited awareness and technical expertise, regulatory uncertainty, the absence of uniform reporting standards, and organisational resistance to change (Pandey et al., 2023). These barriers help explain why ESG adoption and disclosure quality vary so widely among firms operating in the same market, and why studies using self-constructed ESG scores, such as this one, remain necessary in contexts where standardised third-party ESG ratings are not yet widely available.

Findings on the ESG-financial performance relationship are mixed. Some studies report that ESG initiatives raise costs and reduce firm value by diverting resources away from core operations (Aupperle et al., 1985; Lys et al., 2015), while others find no significant relationship, or one that varies by pillar and industry (Barnea & Rubin, 2010; Low & Xu, 2024). Several studies specifically link environmental performance to short-term profitability declines because of the upfront cost of environmental investment, even where long-term gains are expected (Horvathova, 2010; King & Lenox, 2001). Social and governance performance, in contrast, are more consistently associated with improved firm value, through stronger stakeholder relationships, enhanced reputation, and more effective risk management (Brammer et al., 2006; Pandey et al., 2023).

The relationship between ESG performance and firm outcomes can also differ depending on how performance is measured. Naeem and Cankaya (2022), for instance, found that environmental performance had a negative effect on market value but a positive and significant effect on profitability among global energy and power-generation firms, illustrating that a single ESG pillar can point in different directions depending on which financial outcome is examined. More broadly, corporate sustainability has been linked to improvements in a firm's internal processes, which in turn support stronger organisational performance over time (Eccles et al., 2014). For developing economies specifically, sustainability reporting has also been identified as important for achieving the United Nations Sustainable Development Goals and for attracting foreign direct investment, both of which are particularly relevant to Sri Lanka's manufacturing sector as it seeks to expand its access to international capital and export markets (Buallay, 2019).

Within the Sri Lankan context specifically, environmental disclosure has been found to negatively affect firm value and financial performance, while social and governance disclosure show a positive effect (Abeyrathne & Illubethanne, 2023). Positive environmental effects on the financial performance of listed manufacturing firms have also been reported (Madhushika & Uluwatta, 2021), and comparable evidence from the banking sector links ESG performance to financial performance (Shakil et al., 2019). Despite this, no empirical study has yet examined the ESG-financial performance relationship specifically within Sri Lanka's manufacturing sector using a dynamic panel approach that accounts for the persistence of ROA, a gap this study addresses.

The growth of ESG reporting has also created demand for dedicated ESG rating providers to assess and score firms' disclosures in a standardised way, reflecting investors' increasing need for comparable, credible information as reporting practices mature (Gupta & Motwani, 2022). This kind of supporting infrastructure has developed more slowly in economies such as Sri Lanka, where ESG disclosure remains voluntary, which helps explain why independently verified, comparable ESG data for local firms remains scarcer than in developed markets.

Momentum toward ESG has also been driven by shifts in investor and workforce expectations. In one global investor survey, a large majority of asset managers indicated they expected to fully embed ESG considerations into investment decisions by 2025, and nearly half of investors said they would be prepared to divest from companies that failed to demonstrate adequate ESG action (PWC, 2022). Regulators have moved in step with this shift: the United Kingdom, for instance, introduced mandatory climate-related financial disclosures for its largest companies in 2022 (GOV.UK, 2022). Workforce attitudes point in the same direction, with most employees surveyed globally expressing a preference for working for organisations that visibly address ESG-related concerns (PWC, 2022). These global shifts add external pressure on firms in export-oriented economies such as Sri Lanka to strengthen their ESG practices, even where domestic disclosure remains voluntary.

The mixed findings noted above partly reflect a persistent negative view of ESG spending in parts of the literature: some scholars treat ESG-related expenditure as a cost that constrains resources otherwise available for core operations, arguing that when such spending is driven by managers' own interests rather than firm value, it can erode rather than build shareholder wealth (Lys et al., 2015). Other studies find ESG programmes to be largely unrelated to financial performance rather than actively harmful (Barnea & Rubin, 2010), underscoring why the direction and significance of the ESG-financial performance relationship cannot be assumed and needs to be tested empirically within each specific industry and country context, as this study does for Sri Lankan manufacturing.

3. Methodology

This study adopts a positivist, quantitative research design, which allows findings from the sampled firms to be generalised to the broader population of listed manufacturing firms in Sri Lanka.

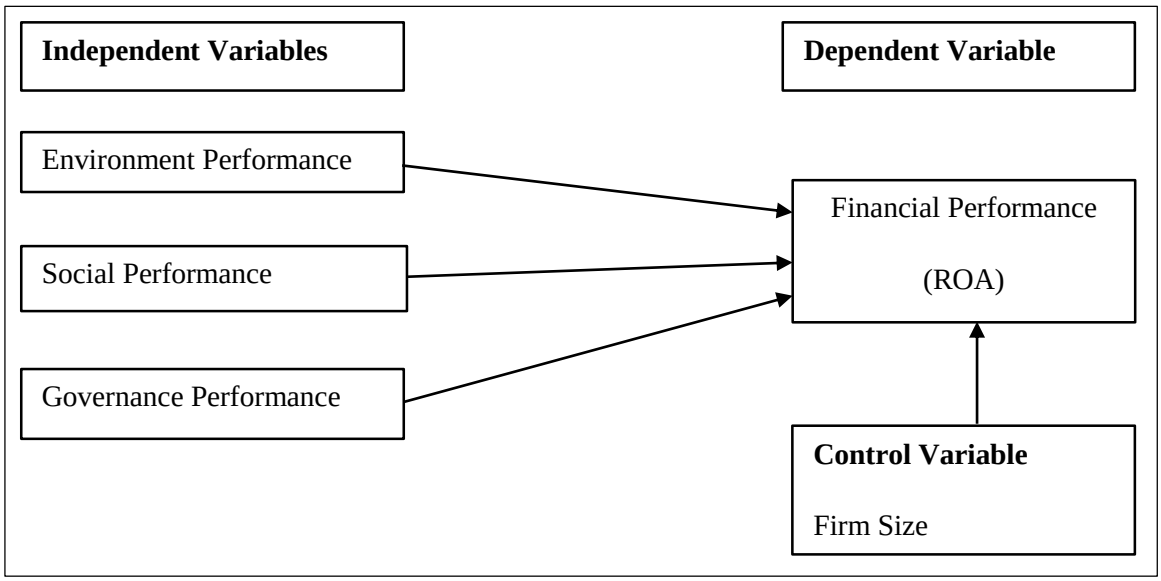


Figure 3.1: Conceptual Framework

Source: Developed by the researcher

3.1. Hypotheses Development

Based on the reviewed theoretical and empirical evidence, this study proposes three hypotheses.

Environmental performance has been linked to short-term cost increases from pollution control, renewable energy adoption, and waste management, which can depress profitability even where long-run benefits exist (Horvathova, 2010; King & Lenox, 2001); consistent with signalling theory, however, credible environmental disclosure is still expected to signal long-term firm viability to stakeholders (Hira et al., 2023).

H_1: Environmental performance positively impacts financial performance.

Social performance, through employee welfare, diversity, and community engagement, strengthens stakeholder relationships and lowers turnover and reputational risk, which prior evidence links to improved profitability (Madhushika & Uluwatta, 2021; Sadiq et al., 2022).

H_2: Social performance positively impacts financial performance.

Governance performance, through board independence, ethics, and transparency, improves oversight, reduces risk, and increases investor confidence, all of which are associated with stronger financial performance (Ahmad et al., 2021; Clark et al., 2014).

H_3: Governance performance positively impacts financial performance.

3.2. Variable Measurement

Dependent variable

Financial performance, the dependent variable, is measured using return on assets (ROA), The return on assets evaluates both the profit margin and the profit margin connected with the assets used in the firm. ROA ratio is a widely used metric to assess financial performance since it indicates how well firms use their assets to generate profits. This study measures financial performance through accounting-based analysis, specifically utilizing ROA (Hira et al., 2023). ROA is also documented as a persistent measure, since firm-specific factors such as competitive advantage and asset efficiency tend to keep profitability stable over time (Fairfield et al., 1996; Goddard et al., 2005).

Formally, ROA is calculated as net income divided by total assets, consistent with its standard definition as an indicator of a firm's profitability relative to the asset base it employs (Damodaran, 2005).

The research also found that business factors like the size of the business, the business market share, and the characteristics of the industry affected the differences in profit persistence of the businesses. In the study of accounting-based financial performance measures, Fairfield et al. (1996) noted that, in contrast to the other financial indicators, ROA exhibits a high level of persistence. This was attributed to the nature of assets and long-term investments organisations make, where the returns are likely to be continuous.

Independent Variables

The three independent variables are environmental, social, and governance performance, each scored on a 0-4 scale across defined criteria: environmental performance covers carbon emissions, water and energy efficiency, waste management, and material usage; social performance covers employee health and safety, diversity and inclusion, and human rights; governance performance covers board structure, ethics and compliance, and transparency (Weerasinghe et al., 2023; Alagiyawanna & Tilakasiri, 2023; Ahmad et al., 2021; Dissanayake & Tilt, 2016; Baran et al., 2022). A score of 0 reflects no action, rising to 4 for practices that exceed industry standards (Dissanayake & Tilt, 2016; Alagiyawanna & Tilakasiri, 2023).

Control Variable

Firm size, measured as the natural logarithm of total assets, is included as a control variable because it consistently affects ROA (Niresh & Velnampy, 2014). Firm size also exhibits its own persistence, since a firm's past size shapes its future performance (Goddard et al., 2005; Majumdar, 1997); this study therefore does not treat it as a strictly exogenous regressor but as a variable subject to the same dynamic behaviour the two-step system GMM specification is designed to accommodate, which justifies including it as a control within, rather than outside, the dynamic model.

3.3. Sample and Data Collection

The population comprises all 49 manufacturing firms listed in Sri Lanka. From this population, 20 firms were purposively selected on the basis of data availability: only firms that published a standalone sustainability report, or disclosed ESG-related information within their annual reports, continuously across the 2015-2023 period were retained, since ESG disclosure is not yet a mandatory requirement for Sri Lankan listed firms. Data were collected from the annual and sustainability reports of these 20 firms over nine years (2015-2023), yielding a balanced panel of 180 firm-year observations. Each ESG criterion was scored using the rubric described above, based on the information disclosed in these reports.

The data used in this study spans over 9 years (2015-2023), providing sufficient information for analysis. The disclosures made voluntarily and included in the annual reports of twenty manufacturing companies listed on the Colombo Stock Exchange serve as its foundation (Madhushika & Uluwatta, 2021). ESG performance is measured by the ESG performance scoring method. According to this method, there are standard criteria for all three variables: environment, social, and governance. In the ESG scoring model, each dimension ranges from 0 to 4, indicating that 0 equals no actions or minimal efforts, 1 is assigned if limited efforts or compliance with basic standards, 2 stands for moderate efforts with visible projects or initiatives in place, 3 reflects extensive efforts and ongoing initiatives with measurable impacts, meanwhile, 4 depicts best practices, significant investments, and results exceeding industry standards (Dissanayake & Tilt, 2016; Alagiyawanna & Tilakasiri, 2023).

3.4. Analytical Technique

The research employed statistical techniques to examine quantitative data gathered from 20 manufacturing firms listed in CSE. As a result, the panel data were gathered from annual and sustainability reports from 20 manufacturing firms covering 9 periods from 2015 to 2023. Descriptive statistics, correlation analysis, Two-step System GMM regression model, and the relevant post-estimation tests were used accordingly to validate the results. This is essential as

the dependent variable (ROA) of the study is assumed to be persistent. Hence, according to Arellano and Bond (1999) failure to adjust this persistency in a panel model would lead to biased results due to endogenity. Therefore, to overcome this methodological gap, this study applies Two-step System GMM regression model.

4. Results and Discussion

2.1. Descriptive Statistics

The descriptive statistics of the data gathered from dependent and independent variables are shown in the table below. Descriptive statistics display the minimum, maximum, mean, and standard deviation to provide an overall data view.

Table 4.1: Descriptive Statistics

	Mean	Maximum	Minimum	Std. Dev
ROA	10.87	71.72	0.67	12.14618
E	5.9	16	0	3.939628
S	6.3	12	2	2.196747
G	4.91	11	1	2.289858
LFS	23.25605	26.41482	19.77265	1.494558

Source: Constructed by the researcher based on Stata output

Over the study period, the sample firms report a mean ROA of 10.87 per cent (SD = 12.15), ranging from 0.67 per cent to 71.72 per cent, indicating considerable variation in profitability across manufacturing firms. Average scores for environmental (5.90 of 16), social (6.30 of 12), and governance (4.91 of 12) performance suggest firms have adopted ESG practices only moderately relative to the maximum achievable score, with governance showing the lowest average uptake. Firm size is relatively stable across firms (mean = 23.26, SD = 1.49), consistent with a sample of established, listed manufacturers.

2.2. Correlation Analysis

Table 4.2: Correlation Analysis

Variable	ROA	E	S	G	LFS
ROA	1.0000				
E	0.2377	1.0000			
S	0.2115	0.8969	1.0000		
G	0.1875	0.8542	0.8894	1.0000	
LFS	0.0459	-0.0111	0.0414	0.0787	1.0000

Source: Constructed by the researcher based on Stata output

Table 4.2 presents the pairwise correlation coefficients between the study variables, together with the corresponding p-values. ROA is positively and significantly correlated with all three ESG dimensions: environmental performance ($r = 0.238$, $p < 0.01$), social performance ($r = 0.212$, $p < 0.01$), and governance performance ($r = 0.188$, $p < 0.05$), indicating that each pillar individually moves in the same direction as financial performance in the raw data. Firm size shows a weak, statistically insignificant association with ROA ($r = 0.046$, $p > 0.10$). The three ESG dimensions are highly correlated with one another (r ranging from 0.854 to 0.897, $p < 0.01$), which is expected given their shared conceptual basis and is formally addressed at the regression stage through variance inflation factor (VIF) diagnostics.

2.3. Regression Results and Discussion

Table 4.3: Two-step System GMM Output

ROA	Coef.	Std. Err.	z	P value	VIF
ROA L1.	0.8705	0.0180	48.31	0.000 *	
E	-0.4007	0.1652	-2.43	0.015 *	7.18
S	0.6744	0.1674	4.03	0.000 *	5.66
G	0.3992	0.1223	3.26	0.001 *	5.28
LFS	-0.0667	0.0159	-4.17	0.000 *	1.03
Wald chi = 84422.18; Prob > chi2 = 0.000					

Note: * significant at 5% level.
Source: Constructed by the researcher based on Stata output

The Wald chi-squared statistic (84422.18, $p = 0.000$) confirms that the model is jointly statistically significant. Lagged ROA carries a coefficient of 0.8705 ($p = 0.000$), confirming that ROA is significantly persistent in the Sri Lankan manufacturing sector: past performance strongly predicts current performance, which validates the choice of a dynamic GMM specification over a static panel model.

Variance inflation factor diagnostics, reported alongside the regression coefficients in Table 4.3, indicate that multicollinearity is not a concern for this model: the ESG variables carry VIF values between 5.28 and 7.18, comfortably below the conventional threshold of 10, while firm size carries a VIF of only 1.03. The elevated but acceptable VIF values for the ESG pillars are consistent with their strong pairwise correlations reported in Table 4.2, and confirm that the coefficient estimates for each pillar can be interpreted with confidence.

Social performance ($\beta = 0.6744$, $p = 0.000$) and governance performance ($\beta = 0.3992$, $p = 0.001$) both have a significant positive effect on ROA, supporting H2 and H3. This is consistent with the view that employee welfare, diversity, and governance mechanisms such

as board independence and transparency strengthen stakeholder trust, lower operational risk, and translate into measurable financial gains within the study period.

The positive effect of social performance is consistent with evidence that socially responsible practices strengthen brand image, reduce employee turnover, and support more effective risk management, all of which translate into stronger financial outcomes (Pandey et al., 2023). This channel is likely to be especially relevant in Sri Lanka's labour-intensive manufacturing sector, where investment in employee welfare, health and safety, and workforce diversity can improve productivity and operational efficiency, and where firms that manage human capital well are better placed to attract and retain skilled workers.

The positive governance effect is consistent with the view that strong board independence, ethical conduct, and transparent disclosure reassure investors that management is acting in shareholders' interests, which can lower firms' cost of capital and support higher valuations. Weak governance structures, by contrast, have been linked to greater exposure to regulatory and market risks among Sri Lankan firms (Abeyrathne & Illubethanne, 2023), so the results suggest that governance quality is a channel through which manufacturing firms can protect financial performance independently of their environmental or social initiatives.

Environmental performance (β = -0.4007, p = 0.015) has a significant negative effect on ROA, which does not support H1. This finding, while contrary to the hypothesised direction, is plausible within the Sri Lankan manufacturing context for several reasons. First, environmental compliance in manufacturing, such as installing pollution-control equipment, transitioning to renewable energy, or securing an Environment Protection Licence, requires substantial upfront capital that is expensed well before any efficiency gains are realised, a burden that falls disproportionately on manufacturing relative to less capital-intensive sectors (Horvathova, 2010). Second, because ESG disclosure is still voluntary in Sri Lanka, firms that report more extensively on environmental initiatives are often those making the largest and most recent investments, which have not yet translated into cost savings within the study's nine-year window. Third, Sri Lankan manufacturers operate under tighter margins and less-developed green financing markets than firms in the developed-country settings from which much of the underlying theory was derived (Belal & Momin, 2009), so the short-run cost of environmental compliance is felt more directly in ROA. Taken together, these factors suggest the negative coefficient reflects a short-run cost effect specific to the local operating environment rather than a rejection of the long-run business case for environmental performance, which remains supported by signalling theory.

This finding is also consistent with broader evidence that the efficiency gains and cost savings from environmental investment, such as reduced energy and waste-management costs, tend to

materialise only in the longer run, after the initial capital outlay has been absorbed (King & Lenox, 2001). This suggests that the study's nine-year window may capture more of the cost phase than the eventual payoff phase for firms that made their largest environmental investments later in the period.

Firm size has a significant negative effect on ROA (β = -0.0667, p = 0.000), suggesting that larger manufacturing firms in the sample generate proportionally lower returns on their asset base, possibly reflecting diminishing operational efficiency at scale within this sector.

2.4. Post-estimation Diagnostics

Table 4.4: Arellano-Bond Test for Autocorrelation

Order	z-value	Prob>z
1	-2.0748	0.0380
2	-0.7616	0.4462

Source: Constructed by the researcher based on Stata output

The Sargan test of overidentifying restrictions returns a p-value of 0.999, well above the 5 per cent threshold, confirming that the instruments used in the GMM estimation are valid and that the model does not suffer from overidentification.

The Arellano-Bond test (Table 4.4) shows a significant first-order result (z = -2.075, p = 0.038) and an insignificant second-order result (z = -0.762, p = 0.446). This pattern is consistent with a correctly specified dynamic panel model: first-order autocorrelation is expected by construction in a first-differenced GMM estimator, while the absence of second-order autocorrelation confirms that the instruments are valid and the moment conditions are not violated, supporting the reliability of the reported coefficients.

5. Conclusion

This study examined the effect of environmental, social, and governance performance on the financial performance of 20 listed manufacturing firms in Sri Lanka over 2015-2023, using a two-step system GMM model to account for the persistence of ROA. The results show that social and governance performance significantly and positively affect ROA, supporting H2 and H3, while environmental performance has a significant negative effect, rejecting H1. Firm size negatively affects ROA. These findings indicate that social and governance initiatives translate into measurable financial gains, whereas environmental initiatives impose short-run costs that outweigh their benefits within the study period, even though their long-run value, as signalling theory suggests, is not in question.

For investors and shareholders, the findings support prioritising firms with strong social and governance practices when selecting investments, while treating environmental performance as a longer-horizon commitment whose financial payoff may only emerge beyond the short run. For manufacturing firms, investment in employee welfare, diversity, and governance structures can be pursued with reasonable confidence of near-term financial benefit, whereas environmental investment should be planned with a longer payback horizon, supported where possible by efficiency gains and compliance-driven cost avoidance. For regulators and policymakers, including the CSE, the SEC, and the Central Bank of Sri Lanka, the results support continuing to mandate ESG disclosure while introducing incentives, such as tax relief or green financing support, to offset the short-run cost burden of environmental compliance for manufacturing firms. Existing collaborative arrangements, such as the memorandum of understanding between the SEC, the CSE, and the CFA Society Sri Lanka to raise investor awareness of ESG principles, illustrate one avenue through which such support can be coordinated, easing the transition toward the country's broader sustainability and export-compliance goals.

This study is limited to 20 firms with continuous ESG disclosure, which may not represent manufacturing firms with weaker disclosure practices, and it examines a single sector over a nine-year period. Future research could extend this model to other sectors and a longer time horizon, disaggregate ESG dimensions further, or examine whether the environmental performance-ROA relationship changes as environmental investments mature over time. Cross-country comparisons between developed and developing markets could also help identify which regulatory and cultural factors shape the success of ESG practices, and refining the measurement of ESG performance against established reporting frameworks such as the GRI and SASB standards would further strengthen the comparability of future findings.

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CHAPTER FIVE

Effect of Urbanization, Economic Growth, Social Globalisation, and Foreign Direct Investment on Climatic Changes in Middle-Income Asian Countries

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Abstract

This study examines the growing environmental challenges that middle-income Asian nations face as a result of rapid economic growth and social change. The study examines the effects of urban population, GDP per capita, social globalisation, and foreign direct investment (FDI) on climate change as indicated by carbon emissions between 2004 and 2023. To determine whether development patterns exacerbate or mitigate environmental degradation, the study assesses both short- and long-term relationships among these variables using a balanced panel dataset and panel-based econometric techniques. The findings suggest that social globalisation helps reduce climate change emissions through effective planning and harmony among people, thereby raising awareness of the importance of protecting the environment. However, all the other variables (FDI, economic growth, and urbanisation) tend to increase emissions due to industrialisation and higher consumption of carbon-emitting products. According to the findings, these economies are in a transitional stage where environmental pressures are caused by early development but are eventually alleviated by structural changes that support sustainability. The study comes to the conclusion that in order to achieve balanced and low-carbon economic growth, policymakers must promote green investments, improved environmental governance, and sustainable urban development, while social awareness programs are crucial to make the environment healthy.

Keywords: *Climate change; Foreign direct investment; Social globalisation; Urbanisation.*

1. Introduction

One of the major global concerns of the twenty-first century is climate change that is mainly caused by human activities such as industrialization, energy consumption and land use changes. Climate change refers to the net rise in the Earth's temperature and the continuously

changing climate patterns. The ever-increasing emission of greenhouse gases, especially CO2, has intensified global warming, extreme weather conditions, and disruption of the natural ecosystem and economic systems. In particular, carbon dioxide (CO_2) has seen an increase of about 50% since the pre-industrial period and has reached very high levels that have not been seen for millions of years. These effects are particularly sensitive in developing regions since they cannot adapt in the quest to achieve economic growth. Middle-income Asian countries are a significant target population because they are undergoing rapid economic expansion and mounting environmental stresses, which is why it is essential to understand the development and climate change interaction. Saeed et al., (2021) argues that the changes associated with global warming are not only that the countries are getting hotter, but also that diverse changes happening in different regions and sectors are coming up slowly over time, as if the Earth is adjusting to the new order. Therefore, to cope with such a global situation, it has become vital to understand the different adaptive responses of various groups of countries. (Adamo el al. 2021). However, adaptation efficiency is different for each sector. Companies are usually very strong in this regard, as they manage to reduce the negative impacts of climate change by about 72%, followed by residents at 49% and farmers at 38%. Nevertheless, the climate change adaptation efforts of these countries are still under siege by the ever-increasing deterioration of the climate. (Saeed, 2023).

The emissions of fossil fuels, large-scale cutting of trees, and various industrial agriculture practices have contributed to the rise in GHG (greenhouse gas) levels. In particular, carbon dioxide (CO_2) has seen an increase of about 50% since the pre-industrial period and has reached very high levels that have not been seen for millions of years. The scientific community agrees that it is the human-produced greenhouse gases that are causing the global warming we are experiencing today. Severe climate variations such as melting glaciers, blazing heat, and erratic rainfall are going to push even further the limits of the resilience of countries with a middle-income status. They usually depend on foreign direct investment (FDI) to a great extent for their economic growth. Thus, foreign direct investment (FDI) is one of the key drivers of economic development of middle-income Asian economies because it allows them to access capital, advanced technology, and employment. Nevertheless, the environmental effects are more or less unknown. FDI may increase the emissions of energy-intensive industries, but sustainable practices and technology transfer may also enhance environmental performance.

Economic factors are not the only influential ones; social factors also have a significant impact on environmental outcomes (Hanvoravongchai, 2025). Besides foreign direct investment, there are other variables that are related to the environmental outcomes, such as the GDP per capita, social globalisation, and urban population growth. These forces influence

consumption trends, heighten sustainability consciousness, and force resource efficiency. Thus, coming up with efficient urban design and implementing green policy frameworks are paramount for the urbanisation process to be a dual benefit of development and environmental stability. These factors combined influence each country's environmental sustainability alongside economic growth (Zafar, 2021).

Hence, the existing empirical studies of the relationships underscore the importance of an in-depth study that considers all these factors collectively rather than individually.

The main objective of this study is to determine the influence of foreign direct investment (FDI) on climate change in middle-income Asian countries, considering the interrelations between the demographic, social, and economic factors. In particular, the paper will discuss the impact of FDI, gross domestic product per capita, urban population share, and social globalisation on carbon dioxide emissions, as well as whether these effects vary in the short run and long run.

This study, based on modern panel data from 2004-2023, is relevant to the existing body of literature in that it provides a thorough analysis of the social and economic factors underlying environmental change. The study uses panel econometric techniques to explain the impact of development paths on environmental sustainability in middle-income Asian economies, capturing both short- and long-term processes. The results provide policymakers with practical information by identifying solutions that will help attract eco-friendly investment, reinforce environmental laws, and promote green urbanisation. Finally, the study supports the goal of realising sustainable development in economic growth with the protection of long-term environmental stability and climate change.

2. Literature Review

This section provides a stringent critique of both theoretical and empirical literature on the foreign direct investment (FDI) and environmental degradation (with specific reference to carbon dioxide (CO 2) emissions) relationship in the middle ASIAN contexts. The review draws theoretical arguments and empirical evidence to shed light on existing debates, methodological differences, and gaps in the existing knowledge. It also questions the power of GDP per capita, urbanisation, and social globalisation as relevant control variables that determine environmental performance. The key objective of the review is to reveal inconsistencies in the previous results and, by extension, justify the need to conduct a dynamic and region-specific study.

2.1. Theoretical Review

The theoretical literature provides a number of conceptual frameworks that explain how FDI can affect the quality of the environment. One such major example is the Environmental Kuznets Curve (EKC) hypothesis of Grossman and Krueger (1991), which assumes an inverted-U-shaped relationship between economic growth and environmental degradation. Under this model, there is an increase in the emissions of pollutants in the initial stages of growth and then a decrease after an income threshold is reached, and this is due to structural change, advancement, and tightening of environmental laws. The empirical support of the EKC in developing economies, e.g., the study by Raihan (2023) about Bangladesh, suggests that economic growth can eventually bring a decrease in emissions; however, this process depends on the effectiveness of policy tools and the rate of technological progress. Critics argue that the EKC will not be assumed to assume that it is universal and could not explain country-specific structural and institutional heterogeneities.

The second theoretical view is the Pollution Haven Hypothesis (PHH) by Walter and Ugelow (1979), which holds that multinational firms will move polluting operations to the area where the environmental laws are relatively lenient and thus foreign direct investment (FDI) inflows may increase the level of emissions in developing economies. The Pollution Halo Hypothesis (PHHH), on the other hand, offers that FDI does have the potential to improve the quality of the environment by the diffusion of better technologies, cleaner production methods, and better management practices. Both hypotheses are supported by the research by Abbasi et al. (2023), emphasising that the provision of the net effect of FDI on the environment depends upon the domestic regulatory systems and the host country's absorptive capability. All these counter-theoretical lenses illustrate that the phenomena of FDI as such are neither universally harmful nor helpful; in fact, the effects of FDI on the environment are circumstantial.

The discussion of theoretical issues is currently enhanced by technological innovation and the adoption of renewable energy. Rej et al. (2022) argue that innovation-based economic growth and the use of renewable energy are unconditionally important avenues for climate change reduction. In their model, they consider asymmetric causal relationships, according to which positive and negative technological progress perturbations cause divergent environmental responses. This position is consistent with the pollution halo argument, which holds that environmentally responsible FDI would promote Sustainable Development Goals (SDGs), in particular those related to climate action and clean energy. However, the concept of innovation alone fails to guarantee sustainability without effective economic and institutional conditions.

Compared to FDI, GDP per capita, urbanisation and social globalisation are hypothetically involved in the determination of environmental outcomes. High levels of income smooth out consumption patterns and energy consumption; urbanisation increases industrial agglomeration and infrastructure growth, and social globalisation shapes environmental awareness, lifestyles, and the spread of environmental policies. Therefore, the combination of such explanatory variables allows a more comprehensive view of the FDI environment nexus.

2.2. Empirical Review

Empirical studies provide inconsistent results related to the nexus between foreign direct investment and CO 2 emissions. Using panel data on 46 Asian states, Khan et al. (2021) found that the consumption of renewable energy has a strong mitigating effect on emissions, but the influence of economic growth and foreign direct investment is augmenting. Their empirical results support the hypothesis of the Environmental Kuznets Curve (EKC), whereby environmental amelioration starts at a particular level of income per capita. However, the fact that the authors use a number of static estimators could result in the inability to capture the adjustment mechanisms that take place dynamically within the countries.

Similarly, Haseeb et al. (2018) utilised advanced panel econometric models to question the place of renewable energy, foreign direct investment, and economic growth. Their findings supported the idea that the consumption of renewable energy resources can reduce emissions, but foreign direct investment and the development of the economy bring harm to the environment in industrialising economies. Although the study supports the long-run validity of the EKC, it is still too weak in applying the country-specific heterogeneity to the Asian region.

Furthermore, Awan and Azam (2022) confirmed the validity of an N-shaped EKC, implying that environmental degradation initially increases with income growth, declines after reaching a certain threshold, and rises again at higher income levels. The results further revealed that technological development and energy consumption significantly contribute to environmental pollution, whereas financial development and social globalisation play a mitigating role in reducing CO_2 emissions.

Moreover, Kirikkaleli and Kalmaz (2020) validated the Environmental Kuznets Curve (EKC) hypothesis and confirmed that economic growth, energy consumption, and urbanisation significantly increase CO_2 emissions in the long run. The results further revealed that urbanisation plays a moderating role in the relationship between economic factors and environmental degradation, indicating that rapid urban expansion amplifies the environmental impact of economic activities. Additionally, they concluded that urbanisation is not only a

direct determinant of environmental degradation but also an interactive factor that strengthens the link between economic growth, trade, and emissions.

3. Methodology

This section provides a detailed description of the research design, choice of the sample, source of the data, specification of the econometric model, and the method of analysis that was used in the study.

3.1. Research Approach

The research design is a quantitative research paradigm, which is based on the analysis of secondary data in a more numeric form and the econometric model, which helps to examine long-term and short-term relationships between FDI and environmental degradation. The explanatory characteristic of the study is expected to establish causal relationships between the independent variables and CO 2 emissions.

It employs a panel data methodology, with both cross-sectional (countries) and time-series (years) dimensions. The panel approach is considered appropriate because it allows the control of the unobserved heterogeneity of countries, besides the ability to capture dynamic adjustments over time. Also, the efficiency of estimations is better when compared to analyses that are limited to either cross-sectional or time-series designs, and the omitted-variable bias is reduced.

3.2. Model Specification

To explore how foreign direct investment affects environmental degradation, a starting functional relationship is established:

$$\boldsymbol{CO_{2it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 GDPPC_{it} + \beta_3 URB_{it} + \beta_4 SG_{it} + \varepsilon_{it}} \quad (1)$$

Where CO_{2it} presents carbon dioxide emissions and $FDI_{it} to\ represents\ the$ Foreign direct investment inflows. Moreover, $GDPPC_{it}$ indicates the GDP per capita. URB_{it}, SG_{it} presents the Urban population and Social globalisation index, respectively.

To test the hypothesis of the Environmental Kuznets Curve, the squared value of GDP per capita was added to the general model, and it was represented in the model with $GDPPC_{it}^2$.

$$\boldsymbol{CO_{2it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 GDPPC_{it} + \beta_3 GDPPC_{it}^2 + \beta_4 URB_{it} + \beta_5 SG_{it} + \varepsilon_{it}} \quad (2)$$

Moreover, the Panel Autoregressive Distributed Lag (Panel ARDL) model is embraced to represent the short and long-run dynamics:

$$\Delta CO_{2it} = \alpha_i + \sum_{j=1}^{p} \gamma_{ij} \Delta CO_{2it-j} + \sum_{j=0}^{q} \delta_{1ij} \Delta FDI_{it-j}$$
$$+ \sum_{j=0}^{q} \delta_{2ij} \Delta GDPPC_{it-j} + \sum_{j=0}^{q} \delta_{3ij} \Delta URB_{it-j}$$
$$+ \sum_{j=0}^{q} \delta_{4ij} \Delta SG_{it-j} + \phi_i (CO_{2it-1} - \theta_1 FDI_{it-1}$$
$$- \theta_2 GDPPC_{it-1} - \theta_3 URB_{it-1} - \theta_4 SG_{it-1}) + \mu_{it}$$

Where: Δ denotes the first difference and $\phi_i$represents the error correction term. Further, θ captures long-run coefficients while $\gamma$and δrepresent short-run dynamics.

3.3. Sample Selection

The research is limited to middle-income Asian nations as per the World Bank income classification. Considering the rapid industrialisation, increasing FDI inflows, accelerated urbanisation, and expanding integration into global markets, the sample was selected. Thus, the sample consisted of 16 countries: Bangladesh, Nepal, Cambodia, India, Pakistan, Sri Lanka, Tajikistan, Georgia, Vietnam, Philippines, Iraq, Jordan, Mongolia, Malaysia, Armenia, and Indonesia.

The economies of Asian middle-income countries are especially relevant as they are in a transition period when the processes of economic growth, globalisation, and environmental sustainability closely relate to each other.

The study will span 2004-2023, depending on the availability of data. This period includes the recent globalisation processes and environmental policy changes.

3.4. Data Collection and Sources

The research will rely on secondary panel data extracted from internationally renowned databases. The data collection sources are below;

Table 3.1: Data collection and sources

Variable	Source
CO_2 emissions	World Development Indicators (World Bank)
FDI inflows	World Development Indicators

GDP per capita	World Development Indicators
Urban population	World Development Indicators
Social globalisation index	KOF Globalisation Index

Source: Developed by the Author

All the variables are reduced to natural logarithms to remedy heteroscedasticity and to interpret the coefficients as elasticities.

3.5. Estimation Techniques and Analysis Tools

The data analysis process will include:

Panel Unit Root Tests

To determine stationarity, panel unit root tests were employed, with the key technique being the Im-Pesaran-Shin (IPS) test. Further, it was ensured that variables are integrated at I (0) or I (1), but not I (2), which is a requirement for ARDL modelling.

Panel ARDL Model

The key reasons for using the Panel ARDL methodology were to embrace the fact that the ARDL technique can handle a mixture of I (0) and I (1) variables while distinguishing between short-run and long-run effects. Further, it allows heterogeneity across countries.

Thus, this study used Mean Group (MG), Pooled Mean Group (PMG), and Dynamic Fixed Effects (DFE) as initial estimators. Then the Hausman test is conducted to determine the most appropriate estimator.

Error Correction Mechanism (ECM)

The importance and the indication of the error-correction term support the existence of long-run equilibrium relations. A negative and significant coefficient is a result of an approach to equilibrium.

4. Results and Discussion

Here, an empirical set of results elaborating on the connection between foreign direct investment, urban population, economic growth, social globalisation, and climate change in middle-income Asian nations is discussed in detail. The analysis relies on the estimations of the panel data and includes unit-root testing and the results of the correlation analysis and regression.

1.1. Descriptive Statistics

Descriptive statistics give an idea of the distributional characteristics of the variables used in the research. The findings show that there is significant diversity among middle-income Asian nations in terms of the inflows of foreign direct investment. The mean figures indicate overall averages in middle-income countries in Asia.

The standard-deviation ranges indicate the range of the deviation from the mean and assert the heterogeneity of development patterns in the region. This difference is the reason why panel data methods are used, representing cross-sectional and time-series dynamics.

Table 4.1: Descriptive Statistics

Variable	Observation	Mean	Standard deviation	Min	Max
co2 emi	320	18.133	2.105	14.608	23.200
fdi	320	3.733	5.537	-37.173	43.912
sg	320	52.542	13.026	23.489	83.391
urb	320	47.634	20.716	14.841	92.020
Gdp pc	320	7.819	0.795	5.633	9.446

Source: Compiled by the author based on STATA output

1.2. Correlation Analysis

The correlation matrix was used to explain how and to what extent the variables were interrelated before the regression analysis. The findings reveal the positive correlation between foreign direct investment and environmental degradation, indicating that increased investment will be characterised by an increase in energy consumption and industrial emissions.

Economic growth shows a negative relationship with environmental degradation, meaning that increased GDP can be decisive in triggering industrialization and infrastructure development and thus exerting more pressure on the quality of the environment unless supported by the implementation of green economic policies.

Multicollinearity was not intense because the correlation coefficients were not higher than the traditional levels, which proved the inclusion of these variables in the regression model simultaneously.

Table 4.2: Correlation Analysis

	co2emi	fdi	sg	urb	Gdp pc
co2emi	1.000				
fdi	-0.242 (0.000)	1.000			

sg	-0.011 (0.838)	0.259 (0.000)	1.000		
urb	0.086 (0.120)	0.179 (0.001)	0.627 (0.000)	1.000	
Gdp pc	0.295 (0.000)	0.069 (0.215)	0.757 (0.000)	0.675 (0.000)	1.000

Source: Compiled by the author based on STATA output

1.3. Unit Root Test Results

Unit root was tested with Im-Pesaran-Shin (IPS) to ensure that the panel data series is stationary and to eliminate the possibility of spurious regressions. The results are as follows.

Table 4.3: Unit Root Test

Variable	CIPS level	Statistic	Level
co2emi	-8.473	0.000	1st difference
fdi	-3.289	0.000	level
sg	-5.302	0.000	level
urb	-8.526	0.000	2nd difference
Gdp pc	-4.169	0.000	level

Source: Compiled by the author based on EViews output

The unit root tests show that some of the variables are stationary at that level, while others achieve stationarity after differencing. Such heterogeneity in the order of integration warrants the use of appropriate panel estimation methods and ensures that the long-run relationships obtained are statistically significant.

1.4. Panel Regression Analysis

The dynamic panel regression analysis was conducted to determine the impact of foreign direct investment, urbanisation, social globalisation, and economic growth on climate change, while adjusting for macroeconomic and globalisation-related factors. Based on the estimated coefficients, foreign direct investment has a statistically significant positive impact on environmental degradation. The results suggest that FDI leads to high carbon emissions, since most of the middle-income Asian economies depend on manufacturing, construction, and energy-intensive industries. Those are the key dominant industries that attract FDI (World Bank reports), leading to high carbon emissions and further supporting the pollution haven hypothesis that poorer environmental regulation thresholds encourage environmentally sensitive investments.

GDP per capita is positively associated with environmental degradation, suggesting that economic growth at the time of the study has not yet shifted toward environmentally

sustainable growth. Nevertheless, it has been observed that social globalisation mitigates environmental degradation, suggesting that global integration, knowledge diffusion, and increased environmental consciousness may promote the adoption of cleaner technologies and eco-friendly methods.

The test results are shown below.

Table 4.4: Estimation test results

Dependent variable (co2emi)		Pooled mean group	Mean group	Dynamic fixed effect
Long run				
fdi	coef.	0.004	0.082	0.024
	std. err.	0.002	0.074	0.008
gdp	coef.	0.038	-0.011	0.044
	std. err.	0.004	0.018	0.013
ur	coef.	0.042	0.270	-0.044
	std. err.	0.008	0.252	0.017
sg	coef.	-0.150	0.047	0.632
	std. err.	0.040	0.535	0.149
Short run				
Speed of adjustment		-0.038	-0.065	-0.019
fdi	coef.	-0.008	-0.021	0.001
	std. err.	0.008	0.033	0.001
sg	coef.	-0.012	-0.002	-0.005
	std. err.	0.006	0.008	0.005
ur	coef.	0.751	1.012	-0.007
	std. err.	0.497	1.639	0.034
gdp	coef.	0.137	-0.007	0.087
	std. err.	0.048	0.077	0.054

Source: Compiled by the author based on EViews output

To examine the best-fit model, the study conducted the Hausman test, and the summary is shown below.

Table 4.5: Summary of model fit

Test	Chi2 value	Probability value	Decision
MG vs PMG	0.25	0.9931	PMG selected
PMG vs DFE	1288.12	0.0000	PMG selected

Source: Compiled by the author based on EViews output

Based on the Hausman test statistics, the Pooled Mean Group was selected. Thus, the analysis results support the claim that all the independent variables have a significant effect on climate change. Thus, it indicates that all the variables except social globalisation have a great positive impact on environmental degradation. Carbon emissions and environmental pressure are increased by the overrepresentation of foreign investment in energy-intensive and manufacturing sectors, as well as by infrastructure development.

5. Conclusion

The study concludes that FDI, GDP, and Urbanisation are significant factors in climate change but have negative effects on it. However, social globalisation makes a significant contribution to reducing environmental degradation and climate change. Although foreign direct investment and financial development are critical to economic development, they now exert significant pressure on environmental sustainability in the chosen nations. In the absence of environmentally sensible investment policies, green financing mechanisms, and ecological degradation due to more stringent policies on environmental issues, the long-term benefits of economic growth can be compromised with ecological degradation.

The results are indicative of the need to shift to sustainable development policies that can reconcile economic growth and environmental conservation. To the policymakers, they should be able to stimulate green investment, advocate green financial instruments, and enhance regulation systems to ensure that positive growth is not at the expense of the quality of the environment.

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CHAPTER SIX

Impact of Overconfidence and Herding Behaviour on Graduates' Investment Decision; Mediating Role of Risk Perception

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Abstract

Behavioural finance emphasises the significant influence of psychological biases on investors' decision-making, often leading to outcomes that deviate from rational financial judgment. Understanding these influences is important in emerging markets such as Sri Lanka, since graduates entering the investment market may have limited investment experience. Therefore, this study examines the effects of two psychological biases, overconfidence and herding behaviour, on investment decisions among management graduates in Sri Lanka, with a specific focus on the mediating role of risk perception. The study adopts a quantitative research approach, utilising a survey method to collect data from a sample of management graduates in Sri Lanka selected through purposive sampling. The data were collected using a structured questionnaire, and a total of 296 data points were analysed using structural equation modelling (SEM). The findings suggest that overconfidence and herding behaviour significantly influence investment decisions among management graduates. Moreover, risk perception partially mediates the relationships between both psychological biases and investment decisions. This suggests that overconfidence and herding behaviour influence investment decisions both directly and indirectly through graduates' perceptions of investment risk. Thus, the findings highlight the need for financial literacy initiatives that help young investors recognise overconfidence, evaluate investment trends rather than blindly follow others' decisions, and assess investment risks more objectively.

Keywords: *Behavioural finance, Herding behaviour, Overconfidence, Risk perception.*

1. Introduction

Research in behavioural finance shows that psychological factors can significantly influence investors' behaviour, often leading to irrational investment decisions (Kengatharan & Kengatharan, 2014; Mahanthe & Sugathadasa, 2018). Understanding these behavioural

influences is particularly important in an increasingly dynamic financial environment, where investors have access to various platforms for capital generation and investment. This study examines the impact of two significant psychological biases: herding behaviour and overconfidence on graduates' investment decisions. It delves deeper into how risk perception influences these relationships. Overconfidence is the tendency for an investor to overestimate their expertise, experience, and ability to select profitable investment opportunities. Treham and Sinha (2016) discovered that investors overestimate their ability to make wise financial decisions, as well as their knowledge, expertise, and ability to select stocks, make future investment plans, and have opinions on the stock market. Such overconfidence may lead investors to place excessive reliance on their own judgments when making investment decisions.

Herding behaviour is the term used to characterise an investor's tendency to follow popular investing trends without doing a full examination by imitating the activities of others (Pratiwi et al., 2020). These behavioural biases may influence investment decisions and the way individuals perceive and respond to investment risks. An investor's subjective assessment of the potential losses associated with different investment opportunities is known as risk perception (Almansour et al., 2023). Hence, the role of risk perception is particularly relevant, as individuals' risk assessments may influence the relationship between psychological biases and investment decisions. Therefore, examining only the direct effects of overconfidence and herding behaviour may provide an incomplete understanding of their influence on investment decisions.

While existing literature has explored the relationship between psychological biases and investment decisions, there is limited understanding of how these biases operate in the Sri Lankan context, particularly among management graduates. This research is expected to fill the gap in understanding how these biases affect risk perception in choosing investment decisions. Mahanthe and Sugathadasa (2018) emphasise that overconfidence can lead to excessive risk-taking as investors believe they are less likely to incur losses. This may lead to poor investment choices and financial losses. According to Alsabban and Alafaj (2020), individuals with higher risk tolerance are more likely to engage in risky investments, whereas those with lower risk tolerance avoid such investments. Thanusan & Kengatharan (2019) highlighted the role of risk perception in moderating the effect of psychological biases on investment decisions, whereas its mediating role is yet underexplored. By examining these psychological factors in the Sri Lankan market context, this study provides insights into how overconfidence and herding tendencies may influence investment decisions, highlighting the importance of recognising these biases and considering individual risk tolerance to make more informed investment choices.

Moreover, the study primarily investigates the impact of overconfidence and herding behaviour on graduates' investment decision-making in Sri Lanka, with a specific focus on the mediating role of risk perception. Although management graduates may hold theoretical knowledge of business and financial concepts, if they are relatively new entrants to the investment market, they might not have the same level of experience as more experienced investors, giving them greater sensitivity to these interruptions. However, the extent to which overconfidence and herding behaviour influence investment decisions in this specific group, and whether risk perception mediates these relationships, remain empirical questions requiring further investigation.

1.1. Research Objectives

1. To identify the influence of overconfidence on graduates' investment decisions.
2. To identify the effect of herding behaviour on graduates' investment decisions.
3. To identify how risk perception mediates the relationships between overconfidence and graduates' investment decisions.
4. To identify how risk perception mediates the relationships between herding behaviour and graduates' investment decisions.

2. Literature Review

2.1. Theoretical Review

This section examines existing research that used different theories on biases, overconfidence, and herding behaviour. It explores the role of risk perception, which acts as an important link between these behaviours and actual investment decisions.

The behavioural finance theory began to emerge in the early 2000s, although its foundations can be traced back to earlier works, notably those of Thaler (1985). It is stated that behavioural finance is "simply open-minded finance" (Mahanthe & Sugathadasa, 2018). Unlike traditional finance theories, which generally assume that investors make rational decisions, behavioural finance recognises that investors may deviate from rationality because of cognitive biases, emotions, and other psychological influences (Shefrin, 2002).

According to the overconfidence theory, people generally rate themselves above average in their abilities (Alsabban & Alarfaj, 2020). They overestimate their knowledge and skills, then feel their knowledge is relative to others. Many investors believe they can consistently time the market. The theory of overconfidence provides a framework for analysing how graduates' overconfident self-assessments of their investment abilities influence their decision-making. Alsabban and Alarfaj (2020) examined overconfidence behaviour in the Saudi stock market using a vector autoregression (VAR) model to analyse the lead-lag relationship between

market returns and market turnover. The study found evidence of overconfidence among investors and established a link between positive past market returns and increased trading turnover, a common indicator of overconfidence.

Prospect theory or loss-aversion theory provides a further theoretical foundation for behavioural finance research. According to this theory, people will convey a different level of feeling towards gains than towards losses; a loss appears larger than an equal gain (Thanusan & Kengatharan, 2019). Prospect theory explains that people often take more risks to avoid losses than to realise gains. However, the risk aversion theory offers a different explanation for why investors might choose to hold their losers and sell their winners: they may believe that today's losers will soon outperform today's winners. Therefore, prospect theory and loss aversion provide a crucial theoretical foundation for understanding the role of risk perception in investment decision-making. They provide background on why graduates might be more sensitive to potential losses than to gains, and how this sensitivity could influence their risk perception and subsequent investment decisions.

2.2. Empirical Review

Previous studies examined the impact of key behavioural factors affecting investment decisions. For instance, Kengatharan and Kengatharan (2014) found that there are four behavioural factors affecting investment decisions, including herding, heuristics, prospect, and market. Also, the research sheds light on the complex interplay among behavioural factors in investment decisions. The four factors above each play a significant role, often interacting to influence how investors make decisions. Similarly, Mahanthe et al. (2018) identified overconfidence, availability bias, and the herding effect as principal factors for individual investors when making investment decisions. They emphasised that the three factors above had a significant positive relationship with investment decision-making in CSE. This indicates that these factors influenced investors to make decisions that might not be entirely rational. On the other hand, showed a significant negative relationship with investment decision-making. This implies that investors who were more conservative in their approach were less likely to make impulsive decisions. They also emphasise that by understanding the impact of these behavioural factors, investors can make more informed decisions and potentially improve their investment outcomes.

The study by Thanusan and Kengatharan (2019) examined the impact of various behavioural factors on investment decisions, particularly in the Sri Lankan market. Their research built upon the existing literature on behavioural finance, focusing on how psychological biases influence investor behaviour. According to the regression analysis results, the efficacy of an individual investor's decision-making in the stock market is significantly influenced by

accounting information, neutral information, and perceptions of the firm and the investor. However, the study found that advocate recommendations and individual financial needs do not significantly impact this effectiveness. Madaan and Singh (2019) investigated four behavioural biases to identify their impact: overconfidence, anchoring, disposition effect, and herding. The study concluded that two factors, overconfidence and herd mentality, significantly affect people's investment decisions. This study used cross-sectional data and quantitative methods to analyse the data.

Perera and Gunathilaka (2022) found that behavioural biases like overconfidence, herding, and loss aversion significantly influence the investment decisions of Sri Lankan investors. Further, they stated that investor behaviour is a combination of rational and irrational. Fahim et al. (2019) examined the influence of overconfidence on investors' investment decisions in the context of the Pakistan Stock Exchange, focusing on the moderating roles of risk perception and religiosity. Their findings revealed that overconfidence had a significant effect on investment decisions; however, neither risk perception nor religiosity significantly moderated the relationship between overconfidence and investment decisions. The study is conducted within the framework of behavioural finance, which challenges the traditional financial theory that assumes investors are always rational and markets are efficient.

Pratiwi et al. (2020) found that herding behaviour did not significantly influence investment decisions, whereas overconfidence had a positive and significant effect. Their findings also indicated that financial literacy moderated the relationship between herding behaviour and investment decisions, but did not significantly moderate the relationship between overconfidence and investment decisions. Although behavioural biases are generally associated with deviations from rational decision-making, Pratama (2022), examining 401 student investors at Institut Teknologi Bandung, found that both herding bias and overconfidence positively influenced investment decisions. However, financial literacy did not significantly moderate either relationship. The study employed a structured questionnaire with data analysed using moderated regression analysis.

Ahmed et al. (2022) examined the mediating role of risk perception in the relationship between behavioural biases and investment decisions among investors in Pakistan. Their findings revealed that risk perception mediated the relationship between blue-chip stock bias and investment decisions, but not the relationships involving herding bias or the disposition effect. Similarly, Almansour et al. (2023) investigated behavioural finance factors and investment decisions in the Saudi equity market, highlighting the relevance of risk perception in understanding investors' decision-making. They recommended that investors, financial advisers, and policymakers consider behavioural biases when developing strategies to

improve investment decisions. Overall, these studies underscore the importance of examining risk perception as a potential mechanism through which behavioural factors influence investment decisions. However, its mediating role may vary across different biases and market contexts.

3. Methodology

3.1. Research Approach

The study employs a deductive research approach, which involved developing hypotheses based on existing behavioural finance theory and previous empirical studies, and subsequently testing them using collected data. This study adopts a quantitative research design to examine the effects of overconfidence and herding behaviour on investment decisions among management graduates in Sri Lanka, focusing on the mediating role of risk perception. A survey research design is employed to collect primary data from management graduates selected through purposive sampling. Data are gathered using a structured questionnaire designed to measure overconfidence, herding behaviour, risk perception, and investment decisions. A total of 296 responses are analysed using structural equation modelling (SEM) to examine the hypothesised relationships among the study variables and assess the mediating effects of risk perception.

3.2. Conceptualisation and Operationalisation

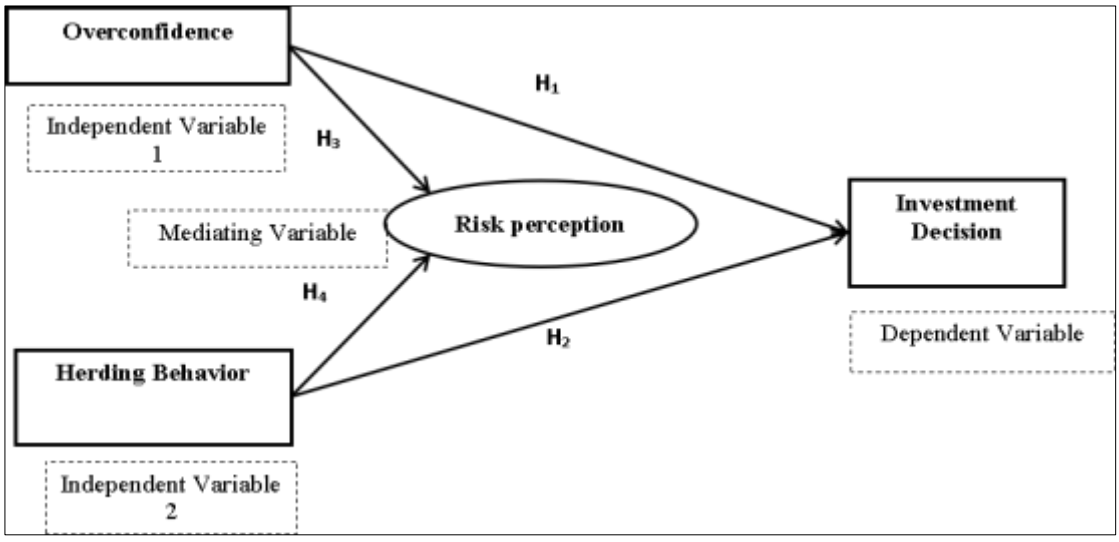


Figure 3.1: Conceptual framework

Source: Developed based on theory and previous research

Table 3.1: Operationalisation of Variables

Variables	Description	Measurement
Overconfidence	Investors overestimate their knowledge, abilities, or control over investment outcomes (Adielya & Mawardi, 2020).	Questions 5-point Likert Scale
Herding Behavior	Investors follow the actions of the majority or crowd, rather than making independent decisions (Ahmad & Wu, 2022).	Questions 5-point Likert Scale
Risk Perception	Investors consider potential losses or uncertainty when making decisions (Ahmed et al., 2022).	Questions 5-point Likert Scale
Investment Decision	Investors follow the process of choosing where and how to allocate money to earn a return (Ahmad & Wu, 2022).	Questions 5-point Likert Scale

Source: Developed by the author based on empirical review

3.3. Research Hypotheses

H_1: *Overconfidence has a significant effect on investment decisions among management graduates in Sri Lanka.*

H_2: *Herding behaviour has a significant effect on investment decisions among management graduates in Sri Lanka.*

H_3: *Risk perception mediates the relationship between overconfidence and investment decisions among management graduates in Sri Lanka.*

H_4: *Risk perception mediates the relationship between herding behaviour and investment decisions among management graduates in Sri Lanka.*

3.4. Sampling Design and Data Collection

The population of the study refers specifically to management graduates in Sri Lanka who completed their management degree and are likely to make investment decisions. The participants for the study sample were collected through the purposive sampling method. As one of the non-probability sampling methods, purposive sampling is used to select respondents who possess the characteristics the researcher desires, such as graduate students with experience in investment decision-making. The cross-sectional design is followed in this study. A total of 400 questionnaires were distributed among graduates, and 296 responses were received.

3.5. Data Analysis Techniques

The data that collected are analysed by empoying Structural Equation Modelling (SEM), path analysis, and confirmatory factor analysis (CFA). The unsatisfactory data was cleaned by removing the questionnaire with poor quality, such as including too many missing values or biased ratings. After that, a pilot test was conducted to check the validity and reliability of the instrument, the questionnaire was pre-tested with a sample size of 20 investors and finalized before being utilised for the survey. The Cronbach's Alpha value was used to measure the reliability of random errors. After that, CFA was run to confirm the factor structure, evaluate the convergent validity of the study, and constructs, and remove the items with low standardised factor loading. The common method bias was tested to check whether the problems of common method bias exist as cross-sectional data were used to achieve the research objectives of this study. Statistical techniques used to achieve the research objectives include correlation analysis and structural equation modeling (SEM) and processed by SPSS and AMOS statistical packages.

4. Results and Discussion

4.1. Reliability of the Measures

Cronbach's alpha was used to assess the reliability of the measures. Generally, a coefficient equal to or above 0.6 is, considered acceptable and indicative of good construct reliability. The Cronbach's alpha values for three independent variables; overconfidence, herding behavior, and risk perception are 0.918, 0.937, and 0.906 respectively. The overall Cronbach's alpha value for investor decision-making is 0.914. since all variables have alpha values exceeding 0.6, this indicates that they are all reliable measures.

Confirmatory factor analysis (CFA) is performed to confirm the factor structure, assess the convergent validity of the study constructs, as well as remove the items with low standardised factor loadings. To address potential common method bias, Harman's one-factor test was performed, given the cross-sectional data were used to meet the research objectives.

4.2. Data Presentation

Table 4.1: Demographic summary of survey responses

Title	Category	Number	%
Age	Below 30	120	40.5%
	30-40	160	54.1%
	41-50	16	5.4%
	Above 50	0	0%

Gender	Male	136	45.9%
	Female	160	54.1%
Education Qualification	Intermediate	41	13.9%
	Bachelors	218	73.6%
	Masters	29	9.8%
	MS/M.Phil.	2	0.7%
	Other	7	2%
Investment Experience	0-2	94	31.8%
	3-5	113	38.2%
	6-10	78	26.4%
	10+	11	3.7%
How often do you invest	Never	22	7.4%
	Rarely	64	21.6%
	Occasionally	127	42.9%
	Frequently	80	27%
	Very Frequently	3	1%

Source: Survey Data

The demographic profile of the 296 respondents indicates that the majority were aged 30–40 years (54.1%), followed by those below 30 years (40.5%). Females represented 54.1% of the sample, while males accounted for 45.9%. Regarding educational qualifications, most respondents held bachelor's degrees (73.6%). In terms of investment experience, the largest group had 3–5 years of experience (38.2%), followed by those with 0–2 years (31.8%). Most respondents invested occasionally (42.9%), while 27% invested frequently.

4.3. Multivariate Normality Test

Table 4.2: Normality Test Result

		Statistics			
		OC	**HB**	**RP**	**ID**
N	**Valid**	296	296	296	296
	Missing	0	0	0	0
Skewness		-1.189	-1.088	-1.273	-1.266
Std. Error of Skewness		.142	.142	.142	.142
Kurtosis		.604	.538	1.029	1.029
Std. Error of Kurtosis		.282	.282	.282	.282

Source: AMOS Output

For a data set to follow a normal distribution, skewness should fall within the range of -1 and +1 and the kurtosis should be close to +3. According to the data analysis (Table 4.2) , all

variables were within the above range, indicating the data were generally normally distributed.

The scatter plot below (Figure 4.1) shows the box type of error distribution, which confirms that the homoscedasticity assumption was satisfied. Also, error observations in a linear pattern and the coefficient values in the table (Table 4.5) are significant, indicating that the model meets the assumption of linearity.

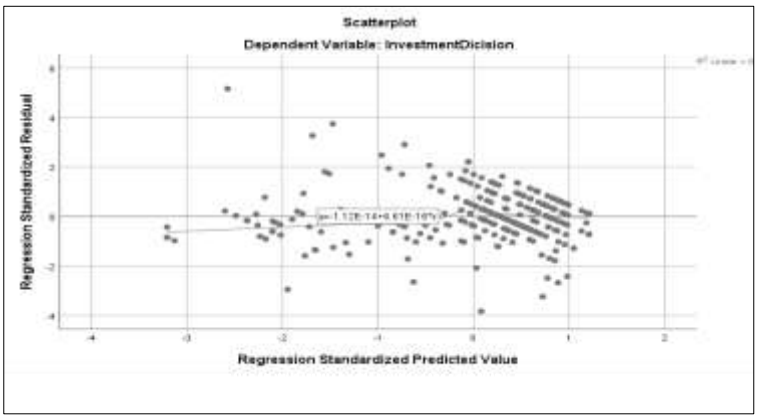


Figure 4.1: Homoscedasticity / Heteroscedasticity

Source: Statistical Output

4.4. Structural Equation Model Analysis

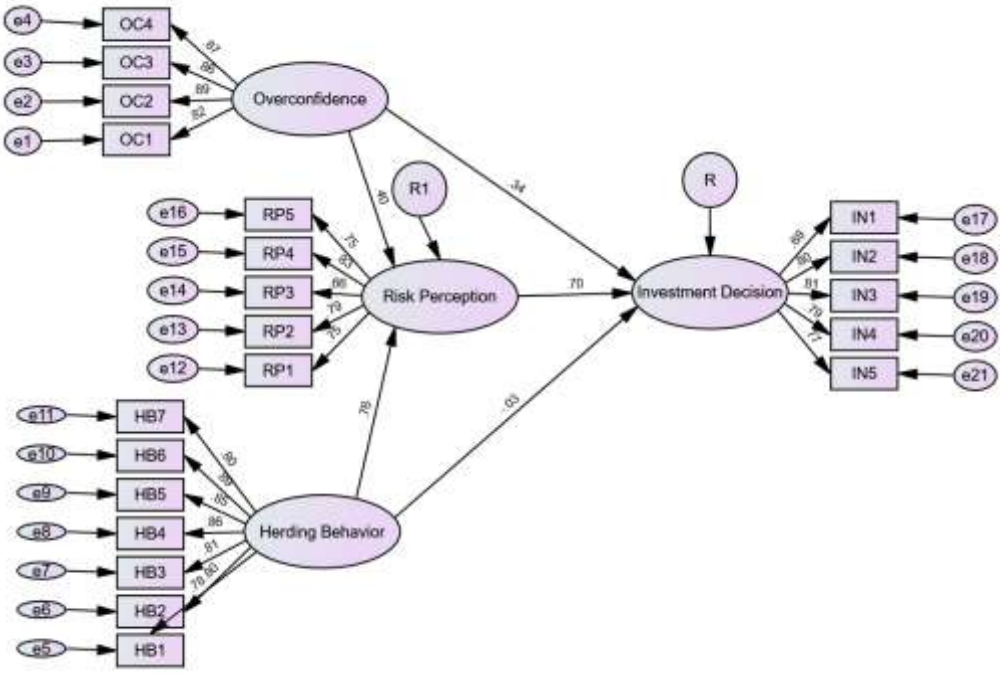


Figure 4.2: Structural Equation Model

Source: Graphical Output AMOS

4.5. Factor Loading, Validity, and Reliability

CFA was performed to validate the factor structure and assess the convergent validity, discriminant validity, and internal consistency reliability of the study constructs. Additionally, items with low standardised factor loading were removed. Table 4.3 shows the measurement model, which allows for the evaluation of the validity and reliability of the constructs. The satisfactory model fit was based on the model modification strategies suggested by Hair et al. (2014), This involved removing several items that exhibited either high error terms, cross-loading, or weak factor loadings.

Table 4.3: Factor Loading, Validity, and Reliability.

Construct	Indicator	Factor Loadings	CR	AVE	√AVE
Overconfidence	OC1	.824	0.919	0.741	0.861
	OC2	.882			
	OC3	.856			
	OC4	.879			
Herding Behavior	HB1	.858	0.939	0.686	0.828
	HB2	.820			
	HB3	.811			
	HB4	.835			
	HB5	.813			
	HB6	.818			
	HB7	.842			
Risk Perception	RP1	.836	0.914	0.682	0.826
	RP2	.869			
	RP3	.713			
	RP4	.876			
	RP5	.825			
Investment Decision	IN1	.778	0.912	0.674	0.821
	IN2	.850			
	IN3	.836			
	IN4	.850			
	IN5	.789			

Source: Statistical Output

The measurement model factor loadings for each latent construct ranged from 0.713 to 0.882, and all were statistically significant, as indicated in Table 4.3. Convergent validity was established through the acceptance of the measurement model, alongside assessments of discriminant validity and internal reliability of the study constructs. Convergent validity was first evaluated by calculating the average variances extracted (AVE) for each set of measures. The results, as shown in Table 4.3, reveal that AVE values range from 0.674 to 0.741 for the constructs, all exceeding the minimum threshold of 0.50. Scholars such as Hair et al. (2014) have suggested that an AVE value above 0.50 reveals that the items loading onto a particular

construct exhibit greater variability than the error term, thus confirming the achievement of convergent validity.

To assess discriminant validity, the square root of the AVE values for each set of measures was calculated. These values exceeded the threshold limit of 0.70, as shown in Table 4.3, suggesting that the constructs are distinct from one another (Hair et al. 2014). Moreover, the square root of each AVE value is higher than the highest shared variance between each construct and other latent constructs, demonstrating acceptable discriminant validity. Furthermore, the composite reliability (CR) values were computed to evaluate the internal consistency reliability of the study constructs. As reported in Table 4.3, all CR values were above the benchmark of 0.70 (Bagozzi & Yi, 2012), indicating that the scales are internally consistent. Hence, the achievement of all the criteria for fitness of measurement allowed the study to proceed to SEM testing.

4.6. Model Evaluation

Table 4.4: Model Evaluation Criteria: Goodness of Fit

Goodness of Fit Indices		Acceptable Range	Observed Value Structural Equation Model
Absolute fit indices	CMIN/DF	<3	2.334
	GFI	Close to 1	0.904
	AGFI	Close to 1	0.855
	RMR	<0.1	0.037
	RMSEA	<0.1	0.067
Incremental fit indices	TLI	Close to 1	0.954
	CFI	Close to 1	0.966
	RFI	Close to 1	0.921
	NFI	Close to 1	0.942
Parsimony fit indices	PGFI	Close to 1	0.602
	PRATIO	Close to 1	0.733
	PNFI	Close to 1	0.691
	PCFI	Close to 1	0.708

Source: Statistical Output

Structural Equation Modeling (SEM), as illustrated in Figure 4.4, was conducted to examine the influence of overconfidence and herding behavior on investment decisions, as well as the mediating effect of risk perception. The SEM yielded acceptable model fit values, as indicated in Table 4.4, with CMIN/DF = 2.334, GFI = 0.966, CFI = 0.904, AGFI = 0.855, and RMSEA = 0.067. All of these parameters fall within the acceptable thresholds recommended by Hair et al. (2014), and Hu and Bentler (1999).

4.7. Model Estimation

Table 4.5: Regression Analysis

Model		Coefficients'			t	Sig.
		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta		
1	(Constant)	.856	.133		6.460	.000
	Overconfidence	.369	.058	.397	6.385	.000
	Herding Behavior	.439	.060	.454	7.302	.000
2	(Constant)	.525	.124		4.228	.000
	Overconfidence	.249	.053	.268	4.668	.000
	Herding Behavior	.151	.063	.156	2.401	.017
	Risk Perception	.485	.055	.490	8.763	.000

a. Dependent Variable: Investment Decision

Source: Statistical Output

The table presents regression analysis results for the relationship between overconfidence, herding behavior, risk perception and investment decisions. In Model 1, investment decision act as dependent variable and overconfidence and herding behavior act as independent variables. B = 0.856, significant at p = 0.000, indicating the level of investment decision when other predictors are zero. Overconfidence has, B = 0.369, Beta = 0.397, t = 6.385, p = 0.000, indicating the overconfidence has a significant positive effect on investment decisions. Herding behavior has, B = 0.439, Beta = 0.454, t = 7.302, p = 0.000, indicating the herding behavior also has a significant positive effect on investment decisions.

According to that both overconfidence and herding behavior significantly influence investment decisions. These results suggest that as individuals become more overconfidence or more likely to follow others, their investment decisions are positively influenced.

In Model 2, investment decision act as dependent variable and overconfidence, herding behavior and risk perception act as independent variables. B = 0.525, p = 0.000. Overconfidence has, B= 0.249, Beta = 0.268, t = 4.668, p = 0.000, here also indicating the overconfidence has a significant effect but weaker than in Model 1. Herding behavior has, B = 0.151, Beta = 0.490, t = 8.763, p = 0.000, indicating the herding behavior has significant effect on investment decision but it also lesser than Model 1. Risk perception has, B = 0.485, Beta = 0.490, t = 8.763, p = 0.000,indicating the strong and significant positive effect on investment decisions suggesting it mediates the relationship of other variables.

According to that adding risk perception reduces the effect of overconfidence and herding behavior, indicating that risk perception acts as a mediator and play significant role in shaping investment decisions.

It is observed that overconfidence and herding behavior both have significant positive direct effect on investment decisions in both models, which accepts H_1 and H_2 hypotheses of the study. Further, risk perception has a strong and significant positive effect on investment decisions. This suggest that risk perception may mediate the relationship between overconfidence and investment decisions. Higher risk perception tends to reduce the effect of overconfidence and herding behavior on investment decisions. Hence can accept H_3 and H_4. An overall direct effect and the mediating effect was significant, that shows the risk perception act as a partial mediator.

The findings of the current study are in parallel with the previous research findings. For instance, Madan and Singh (2019) revealed that overconfidence and herding bias have a significant positive impact on investment decisions. Further, the research by Alsabban and Alarfaj (2020) examined the overconfidence behavior in the Saudi stock market and found evidence supporting the existence of overconfidence among investors in the stock market. When considering the Sri Lankan context, Mahanthe and Sugathadasa (2018) identified overconfidence, availability bias, and herding effect are principal factors for individual investors when making investment decisions. They emphasised that the above three factors had a positive significant relationship with investment decision-making in CSE. Similarly, Perera & Gunathilaka (2022) concluded that behavioral biases like overconfidence, herding, and loss aversion significantly influence the investment decisions of Sri Lankan investors.

The partial mediation of risk perception correspond with the findings of Ahmed et al. (2022), who examined risk perception as a potential mediator between behavioural biases and investment decisions. However, their reported mediation results varied according to the specific behavioural bias considered. Similarly, although Fahim et al. (2019) found that risk perception did not significantly moderate the relationship between overconfidence and investment decisions, the present study examined and statistically established a mediation effect rather than moderation.

5. Conclusion

This study examined the influence of overconfidence and herding behaviour on investment decisions among management graduates in Sri Lanka, with particular attention to the mediating role of risk perception. The findings revealed that both overconfidence and herding behaviour positively and significantly influenced investment decisions. Furthermore, risk perception demonstrated a significant positive relationship with investment decisions. The reduced coefficients of overconfidence and herding behaviour after incorporating risk perception suggest its potential mediating role in these relationships. These findings highlight

the relevance of psychological biases and subjective risk assessments in understanding investment decision-making. The study contributes to behavioural finance literature by examining the relationships between these behavioural factors and investment decisions among management graduates. For practitioners, this might imply specific financial literacy programs directed at addressing cognitive biases such as overconfidence and the influence of social factors in making effective investment decisions. Policymakers should thus consider the inculcation of behavioral insights into regulatory regimes as a means of enhancing transparency in financial markets and reducing the prospect of herd behavior. For further research, it is suggested including additional demographic groups, so that the results of such a comparative study would be a worthy addition to the literature on behavioral finance.

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