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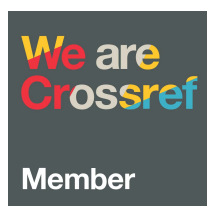
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The Impact of IFRS 9 on Commercial Banks' Performance: Evidence from Cambodia

Zubir Azhar*

ABSTRACT

Following the criticism directed at IAS 39, the IASB issued a standard for financial instruments IFRS 9. This study sheds light on the impact of applying this new standard on Cambodian commercial banks' financial performance. Using ROA and ROE as proxies of financial performance of banks and employing data manually extracted from the annual reports of Cambodian commercial banks, we analyze the impact of adopting IFRS 9 and some bank specific characteristics based on a sample of 152 bank-year observations from 2014 to 2021 to compare the financial performance of these banks before and after applying IFRS 9. The practical outcomes of the regression analysis signified that the implementation of IFRS 9 has a significant and negative influence on the financial performance of Cambodian commercial banks. The results of this study provide useful explanations which are helpful to regulators and standard setters on how banks' performance is affected by the implementation of this new standard. This study is expected to make significant contributions to the body of literature as it is one of the first studies to examine this issue in Cambodia and it provides new evidence about the effect of this new standard on the performance of commercial banks in emerging countries.

Keywords: *International Financial Reporting Standard (IFRS); International Accounting Standard (IAS); Financial performance; Return on assets; Return on equity*

INTRODUCTION

In the aftermath of the 2008 global financial crisis, many criticisms have been leveled of accounting standards for financial instruments, especially international accounting standard no.39 (IAS 39) entitled "Financial instruments: Recognition and Measurement." Incurred credit losses (ICLs) model applied by this standard has proven to be invalid in dealing with and addressing enormous credit losses, especially during the periods of economic downturns (Ntaikou & Vousinas, 2018). Under this model, credit losses are recognized only when there is clear evidence that loss has occurred, which is considered as "too little, too late."

Regulators around the globe (e.g., Group of twenty (G20), 2009; Basel Committee of Banking Supervision (BCBS), 2009; Financial Stability Forum, 2009) have called standard setters to develop accounting standards that allow for a more forward-looking provisioning. In response to these calls, the International Accounting Standards Board (IASB), the

Financial Accounting Standards Board (FASB), and the Consultative Group for Financial Crisis (FCAG) have agreed to come up with a new standard that has the purpose of resolving the late recognition of credit losses. They stated that forward looking information should be used in recognizing loan loss provision (LLP) and fair value (FV) measurement should be taken into consideration when classifying and measuring the financial instruments (BCBS, 2016).

In July 2014, The IASB issued the final version of international financial reporting standard no.9 (IFRS 9) entitled "Financial Instruments" as an alternative to IAS 39. The standard issuance has divided into three phases. The first phase is related to the classification and the measurement of the financial instruments. The second phase is about the impairment model for financial instruments based on expected credit losses (ECL) model. Finally, the third phase focuses on hedge accounting. IASB stated that this standard should be applied in January 2018, and it allowed the early application of the standard in 2015.

Under IFRS 9, the financial instruments are measured at amortized cost (AC), or fair value either at fair value through profit or loss (FVTPL) or fair value through

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other comprehensive income (FVOCI). The new method for classification and measurement depends on the entity business model and the cash flow characteristics of the financial instruments instead of management intent, which was applied under IAS 39.

The new impairment model depends on the forward-looking impairment model to address any changes in the fair value of financial instruments, some time before it is acutely occurred instead of ICLs model, which records impairment loss only after the default had already occurred.

As a result of the accounting improvement introduced by IFRS 9, the way the financial institutions follow in recognizing credit losses changes. It limits credit losses on the one hand but causes a significant increase in the volume of provisions on the other hand. Therefore, the performance of banks and financial institutions might be affected by the adoption of this new standard.

Many researchers (Bellagdid et al., 2021; Besmir et al., 2021; Frykström & Li, 2018; Gornjak, 2020; Khersiat & Alkabbji, 2020; Kund & Rugilo, 2019; Mahendrarajah et al., 2019; Moutinho, 2019; Novotny-Farkas, 2016; Ntaikou & Vousinas, 2018) have analyzed the effect of applying IFRS 9 on the performance of financial institutions across different countries, but they yield mixed results.

In Cambodia, public accountable entities, such as listed companies, banks, microfinance institutions, and insurance companies, as well as large private companies, are required to apply Cambodian International Financial Reporting Standards (CIFRS), which is equivalent to IFRS, in preparing their financial statements. In line with the transition from IAS 39 to IFRS 9 by IASB, CIFRS 9 *Financial Instrument* replaces IAS 39 *Financial Instruments: Recognition and Measurement* for annual periods beginning on or after 1 January 2018. While the Cambodian banking industry has grown rapidly in recent years, little is known about how the banks of this country are performing.

Since previous studies have not focused on banks of such country, it is vital to examine the impact of the application of IFRS 9 on the financial performance of Cambodian commercial banks. Therefore, the purpose of this study is to empirically investigate the profitability of Cambodian commercial banks after the transition from IAS 39 to CIFRS 9.

The profitability indicators employed in this study are return on assets (ROA) and return on equity (ROE). As IFRS 9 come into force and is implemented as of 1 January 2018, the data about these indicators are collected from the annual reports of a sample of Cambodian commercial banks for eight years (from 2014 to 2021). The data about the sampled banks for the first four years are compared with that of the last four years to determine whether the financial performance of these banks have been affected by changes provided by IFRS 9.

It is found that the profitability indicators of Cambodian commercial banks have been significantly deteriorated during the period after the adoption of IFRS 9. This indicates that the financial performance of commercial banks in Cambodia have been negatively influenced by the implementation of this new standard.

Literately, the importance of this study from an academic point of view lies in the importance of the topic of IFRS and the performance of banks in contemporary accounting literature. It provides significant contributions to the existing financial instrument literature particularly in emerging economies such as Cambodia. This research highlights the impact of applying IFRS 9 on the financial performance of Cambodian commercial banks and covering the research gap regarding the influence of this new standard in such country.

As for the practical aspect, the study derives its importance from showing the performance of these banks before and after the application of this standard. This may provide useful information for the authorities responsible for setting standards regarding the impact of the decision to switch to the new issued standards.

Other parts of this paper put forward a brief reference to the transition from IAS 39 to IFRS 9 and the main differences between the two standards, and comprehensive literature review are presented; the third part describes the research methodology used; the fourth part presents the main findings of the study, and the last section shows the conclusions, with some limitations and future research directions.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

In order to analyze how the transition from IAS 39 entitled “Financial Instruments: Recognition and Measurement” to IFRS 9 entitled “Financial Instruments” affects financial performance of Cambodian banks, it is necessary to highlight the new standard’s major contributions in the accounting of financial instruments, before reviewing earlier research that has addressed this issue.

The application of IAS 39 in 2001 sometimes resulted in an inconsistent application and providing irrelevant and non-understandable information. IAS 39 has some shortcomings related to the classification of financial assets as this standard depends upon four categories to classify financial assets. This makes accounting of financial instruments according to this standard complicated and difficult to be applied. Additionally, the classification of such assets according to this standard relied upon the personal judgment of the management, which makes it difficult to achieve comparability either at the level of the entity itself across financial periods or between entities and each other. Besides, a heterogeneous mixture is also another important problem related to this standard as it relies upon both amortized cost (AC) and fair value (FV) in measuring the value of financial instruments, which complicates the ability to assemble the financial statements in the light of this standard. There is also a contradictory between the bases of measuring financial instruments that are measured by FV and their hedging instruments that are measured by AC, which increases the problem of mix measuring, and this is considered as a duality of using two different measurement bases to measure the financial instrument and its hedging instrument (Kund & Rugilo, 2019).

There is a separation between financial instrument and derivative financial instrument that exist in one contract, which leads to lack of clarity of the impact of the contract as a whole although they are one unit. There is another issue related to the fluctuation in earnings as unrealized profits and losses resulted from change in FV of financial asset or liability are recognized in the statement of profits and losses (Duh et al., 2012).

Besides all of the above mentioned shortcomings, applying the ICL model is the most significant shortcoming that prompted IAS users and experts to reevaluate their orientations towards IAS 39 as it

resulted in a delaying in recognizing of credit losses as these losses are recognized and the provisions of the losses are formed only in case of the default of the loan or financial asset as well as the expected losses were not recognized as a result of future events, which is considered “too little, too late” (Halilbegovic et al., 2019).

As a result of the previous mentioned shortcomings of the IAS 39, a severe weakness in the financial stability of banks, most of which were given high credit ratings was revealed because the model of forming provisions to meet the weakness of assets was based on the losses actually incurred and therefore the banks did not have information about the extent of the weakness of their assets and the adequacy of their capital to absorb future shocks. This leads to the exacerbation of the 2008 global financial crisis. Hence, it was necessary to shed light on the inevitability of issuing accounting standards that deal with financial instruments and hedging against potential risks and control the process of recognizing various profits and losses resulting from entering into transactions, in order to reduce the degree of expected risk of using various contemporary financial instruments.

Based upon the call from (e.g., Group of Twenty (G20), 2009; Basel Committee of Banking Supervision (BCBS), 2009; Financial Stability Forum (2009) to replace IAS 39, International Accounting Standards Board (IASB) and Financial Accounting Standards Board (FASB) collaborated to form the Financial Crisis Advisory Group (FCAG), which is concerned with examining how advancements in financial reporting could contribute to boosting the confidence of investors in financial markets. This group issued a report, in which it cited the complexity of different impairment techniques and the deferred recognizing of losses related to loans and other financial instruments as the two main drawbacks in accounting standards and their implementation, and it recommended replacing the ICL model for forming loan loss provision (LLP) with alternative approaches that involve a broader set of available credit information to identify potential future losses in consistency with the needs of users of financial statements and transparency regarding changes in credit trends (Buesa et al., 2020).

In April 2009, the IASB and the FASB announced an expedited schedule for substituting IAS 39 (which was effective from 2005 to 2017) with IFRS 9 by dividing the replacement project into three phases.

In November 2009, the IASB released an Exposure Draft titled “Financial Instruments: Amortized Cost and Impairment” (ED/2009/12) as a first step in its project to replace IAS 39. IFRS 9 introduces a new accounting mechanism for assessing credit losses that differs from that used in accordance with IAS 39, as the new standard relies on the approach of expected credit losses (ECLs), that recognizes losses before they occur and depends on the measurement of losses on information related to past events, current conditions and reasonable predictions (IASB, 2009a). This draft suggested guidelines about the way of incorporating credit loss expectations in the pricing of financial assets through recognizing interest on basis of a credit-adjusted yield and subsequently recognizing alterations to initial expectation as profits and losses. As a result, initial expectations of losses would be gradually recognized over time as credit-adjusted interest, with subsequent alterations in expectations being recognized as they happen (Canals-Cerdá, 2020).

In October 2010, IASB issued the second draft of IFRS 9, which includes new accounting requirements for the classification and measurement of financial liabilities that were the same requirements of IAS 39.

In December 2011, IASB issued the last binding amendment to apply the IFRS 9, which specified the effective date of IFRS 9 for the financial periods beginning on or after December 1, 2015, with an allowance for early application. It is also stipulated that the companies that apply the standard early before January 2012 do not need to amend the financial statements for previous fiscal years or add the additional disclosures mentioned in paragraphs 44s-44w of IFRS 7 entitled “Financial Instruments: Disclosures”. Companies that apply IFRS 9 on or after January 2012 and before January 2013 can choose between adjusting the financial statements for previous years, or to be satisfied with the additional disclosures mentioned in paragraphs 44s-44w of IFRS 7. Finally, companies that implements IFRS 9 on or after January 2013 should release the additional disclosure requirements mentioned in paragraphs 44s-44w of IFRS7 without the need to amend the financial statements for previous financial years.

IFRS 9 also stipulates that companies that do not need to amend the financial statements of previous periods must recognize any differences between the previous book value and the book value after applying IFRS 9 with the opening balance of retained earnings at the beginning of the financial

period that includes the date of early application of IFRS 9, as recent amendments to IFRS 7 require disclosures about financial assets and liabilities on early application of the standard such as the initial classification of a financial asset or liability and its carrying amount under the requirements of IAS 39; the new classification of a financial asset or liability and its carrying amount resulting from the application of IFRS; the value of financial assets or liabilities that were designated as fair value through profit and loss (FVTPL) as required by IAS 39 and are no longer designated as FVTPL under IFRS 9 after distinguishing between financial assets or financial liabilities that can no longer be designated at FVTPL and between these that can be reclassified to FVTPL in accordance with the requirements of IFRS 9.

In November 2013, IASB issued the third draft of IFRS 9 to include amendments to IAS 39 by involving guidance on hedge accounting (IASB, 2013). In July 2014, IASB completed and issued the final amendment to the draft of IFRS 9 that includes a new ECLs model and is mandatory to apply for periods beginning on or after 1 January 2018 (IFRS Foundation, 2014).

The transition from IAS 39 to IFRS 9 indicates a significant change in the accounting for financial instruments, as the shift to a principle-based standard from a rule-based standard as the rules are not adaptive and useless in a changing environment or in an environment with innovative transactions (Gornjak, 2017). The most important accounting improvements included in IFRS 9 are revised classification and measurement of financial instruments, the launch of the model of ECLs for assessing impairment, and an amendment to hedge accounting.

Many changes take place in the classification and measurement of financial instruments by IFRS 9. An entity must recognize a financial asset or a financial liability when the entity becomes a party of the contractual terms of the asset only. When the financial asset or liability is recognized, the entity must classify financial assets and liabilities starting from the first moment of recognition. The financial instruments are measured at AC or FV either at FVTPL or fair value through other comprehensive income (FVOCI). The classification of a certain financial instrument at initial recognition is established based on two trends, which are the business model and the characteristics of cash flows (IASB, 2009b).

As for the first trend, it depends on the way in which financial institutions manage their financial assets in

order to generate cash flows by maintaining the time value of money. This model is determined by the goals and activities that the company seeks to determine. If the business model aims to collect contractual cash flows, representing the principal of debt and return on debt, the financial assets are classified at AC (IASB, 2009b).

Financial assets are classified at fair value through other comprehensive income (FVOCI) if the aim of business model is holding the instruments until the maturity date to acquire contractual cash flows and sell the asset. If the business model aims to buy and sell the financial instrument and is active, the financial assets are classified at fair value through profit and loss (FVTPL). Whatever the classification of financial assets, the return of such assets and ECLs are recorded in profit and loss statement (IASB, 2009b).

The amount, timing, and unpredictability of the future cash flows of banks, as well as all relevant information that is available at the time of the assessment are crucial factors that banks should consider when classifying and measuring their assets. With regard to the contractual characteristics of the cash flow of a financial asset, the details of the contractual payments must be scrutinized and whether these payments are limited to principal and interest payments. It must be pointed out that the accepted interest here consists only of time value and credit risk. Seitz (2019) summarizes the classification and measurement of financial instruments in the light of business model and decisions related to payments and interests in accordance with IFRS 9 in Table 1.

Table 1: Classification of financial instruments according to business model and contractual cash flows

Characteristics of cash flows	Business model		
	Holding until collecting	Holding until collecting & selling	Others
Payments of basic price & interest	AC	FVOCI	FVTPL
Other types of cash flows	FVTPL	FVTPL	FVTPL

Pertaining to the classification of financial liabilities, they are classified according to IFRS 9 at AC calculated by the effective interest method, except for financial liabilities that are measured at FVTPL; financial liabilities that arise when the transfer of the asset does not qualify for derecognition; financial guarantee contracts; liabilities related to loans; and the financial return resulting from the acquisition. Such liabilities are recognized by FV and subsequent

changes in FV are recorded in the statement of profits and losses while changes of credit risk of financial liabilities related to the bank itself are recognized in other comprehensive income statement and they are not transferred back to the statement of profits and losses even if these amounts are achieved and these liabilities are disposed of. While it is not allowed to reclassify financial assets in all cases except if the bank changes the business model, it is not permitted to reclassify financial liabilities in any case (IASB, 2009b).

In order to address the principle of “too little, too late”, a new impairment model based upon ECLs has replaced the model of ICLs. IFRS 9 requires recognition of LLP at the initial recognition of the instrument in addition to recognizing the ECLs at each reporting date to reflect changes in the credit risk of financial instruments, where an accurate and unbiased expected amount cash deficits is estimated after studying a set of possible outcomes, and taking into account the time value of money, based on reliable information with documentary support on the current conditions and expected economic events (IASB, 2013).

This expected amount also requires a set of information, the most important of which are past events such as historical experience in estimating the losses of financial instruments, the following conditions and events, and expectations that affect the collection of expected future cash flows from financial assets (Albrahimi, 2020). This requires updating all data to calculate the ECLs, meaning that credit losses can be recognized, even if the loss event does not occur (Gornjak, 2017). Table 2 shows the way of applying ECLs model on financial instruments as indicated by Sanchidrián and Garcia (2019).

Table 2: Applying ECLs model on classifications of financial instruments

Financial assets classification	ECL model
Financial assets at AC (loans & bonds)	ECLs model to assess the impairment in accordance with IFRS9
Financial assets at FVOCI (loans & bonds)	ECLs model to assess the impairment in accordance with IFRS9
Financial assets at FVOCI (equity)	Without impairment
Financial assets at FVTPL (bonds, equity & derivatives)	Without impairment

For all instruments included in the scope of the requirements of impairment, IFRS 9 mandates the use of the similar measurement base for impairment.

The conception of ECL model is to represent the broad trend of improvement or deterioration in the quality of credit of financial instruments (Casta et al., 2019; Fatouh et al., 2022).

In line with the regulatory framework, ECL assessments consist of four main elements, which are the probability of default (PD), which is an assessment of the probability of default over a defined time period; the exposure at default (EAD) that is the approximated exposure of forthcoming default because of changes after the date of reporting after taking the reimbursement of both principal and interest into account; the loss given default (LGD) that is typically expressed as a ratio of the EAD and is essentially the variance among the contractual cash flows and the corresponding anticipated ones rising from any collateral; and the discount rate that is used to convert an anticipated loss into a present value employing the effective interest rate (Novotny-Farkas, 2016).

Therefore, assessment of ECLs requires using forward information when measuring the LLP, especially when determining the expected changes in default rates, and this was not required before by IAS 39 (Holt & McCarroll, 2015). This is accomplished through either available market information or internal historical amended information that big companies and banks often use to reflect future expectations. In the absence of both types of information, it is valid to use internal model to calculate the default rate in the light of default rates of other companies, or information of financial statements in addition to other sources (Ntaikou & Vousinas, 2018).

Additionally, ECLs are measured independently in the case of significant individual exposures. ECLs are measured collectively when it comes to retail exposures because there is not much information available. Despite this, there should be an access to definite information of borrower, such as exposure of losses, and macroeconomic forecasting data. The bank should categorize its exposures based on characteristics of shared credit risk, for example geographic zone, customer type, industry, kind of product, customer rating, date of initial recognition, term to maturity, quality of guarantee, and loan to value ratio to measure loss allowance on a communal base. It is rather anticipated that variance in PDs is reflected by diverse segments (Novotny-Farkas, 2016).

Because credit characteristics and the macroeconomic environment are continually changing, banks need to

re-segment their sub portfolios. For the purposes of measuring expected losses for regulatory purposes, banks are not permitted to use FV models that do not account for variations in returns and market interest rates that are not acquired in the ECLs by assembling exposures that do not share characteristics of credit risk and excluding contractual repaying of loans (Ntaikou & Vousinas, 2018).

IFRS 9 sets a three-stage algorithm for LLP. This methodology for impairment is based on changes in credit quality or the rising likelihood of default since initial recognition. The shift from stage to another is based upon the fundamental changes in the assessment of the credit risk. IFRS 9 can minimize the severity of the “cliff-effect” and lessen countercyclical impacts by gradually recognizing the ECL throughout the course of the life of the loan (Kund & Rugilo, 2019).

Credit risk is differentiated into Stage 1, where all assets under the classification of AC or FVOCI as they are with minimal credit risk as of the reporting date or at their initial recognition. The majority of the performing loan portfolio held by banks is categorized in this stage. Credit loss has to be recognized since the initial recognizing of such assets onwards. At any time, a financial instrument is originated, a 12-month ECLs, which refers to the share of the lifetime expected credit losses that rise from default events that are probable within 12 months of the reporting date, should be recognized in profit and loss and a reserve of loss is formed as a representative of the initial expectation of credit losses. The loss allowance is equivalent to the cash shortages that would arise from a default event occurring within a year weighted by the likelihood that this default would occur. Interest revenue is computed based on the asset's gross carrying amount before the exclusion of the loss allowance (Seitz, 2019).

Stage 2 comprises assets that “significantly deteriorated in credit quality” since initial recognition but lack actual impairment evidence as there is a raise in the credit risk, and hence a reduction in the credit quality. Financial assets that are currently listed in bank financial statements as “financial assets past due, but not impaired” or underperforming financial assets would mostly be classified in this stage. Although lifetime ECLs that are the expected credit loss resulting from all potential default events throughout the anticipated remaining life of the financial instrument are specified for such assets, interest revenue is still determined based on the

asset's gross carrying value. The reporting entities must assess whether there has been a possibly substantial rise in credit risk at each reporting date. The IASB offers a list of data that might be employed for the evaluation of a substantial deterioration of credit risk. In addition to the valid supposition that the credit risk on a financial asset has raised substantially since initial recognition when the due date of contracting reimbursements has exceeded more than 30 days. The standard setter also provides a "low credit risk exemption", under which financial assets are exempted from the continuous credit-risk assessment and permits them to remain in stage 1 if they demonstrate a low credit risk (Novotny-Farkas, 2016).

Lastly, assets with realized evidence of impairment at the reporting date or the level of credit risk of the financial assets raise up to the classification of non-performing or credit-impaired assets are included in Stage 3. This generally corresponds to the objective evidence of a loss occurrence under the previous IAS 39. Lifetime ECLs are also recognized for such assets. Interest income is computed based upon the asset's net carrying amount, which is the gross carrying amount deducted by the loan loss allowance. Due to the underlying assets' default position, ECL recognized in Stage 3 will probably be larger than the in Stage 2 (Ntaikou & Vousinas, 2018). The way of recognizing the impairment in accordance with IFRS 9 to assess ECL and interest rate of financial assets according to credit risk is indicated in Table 3 below.

Table 3: The assessment of ECLs and interest rate

Stage	Stage 1	Stage 2	Stage 3
Credit risks	Performing financial instruments with non-existent credit risks.	Under- performing financial instruments with low credit risks.	Impaired financial instruments with impairment.
Assessing expected loss	It includes financial instruments and credit risks that do not experience default. The provision is an amount equal expected losses through the coming 12 months or the probability of default during this period.	In case of rising credit risk and default on payment, or in case of not paying installments through 30 days, the credit will be transferred from stage 1 to stage 2 (credit losses throughout the useful life). The provision in this case is an amount equals	In case of decreasing the value of financial instrument or default of paying the credit obviously and continuously, thus amount equal expected losses throughout the useful life should be kept. The amount of impairing of financial instrument by

		the expected losses throughout the useful life of the credit or the financial instrument.	the difference between the book value and the current value of expected future cash flows.
Interest rate	Actual interest rate on the gross book value.	Actual interest rate on the gross book value.	Actual interest rate on the net value.

(Source: Sanchidrián & Gracia, 2019)

While Stage 1 and Stage 2 credit exposures will effectively replace those exposures that are cumulatively evaluated for impairment under IAS 39, Stage 3 credit exposures are similar to those found to be individually impaired under IAS 39 (EY, 2014, p. 8). Thus, the recognition of lifetime ECLs will happen earlier than under IAS 39, i.e., already when there is a substantial rise in credit risk at Stage 2, but before actual default (Stage 3).

Since IFRS 9 recognizes ECLs but disregards changes in market interest rates, the ECL model of this new standard is situated between the incurred loss approach of IAS 39 and fair value accounting.

Among the most important changes imposed by IFRS 9, it includes fundamental amendments to the accounting treatment of hedges stipulated in IAS 39, as it expands the scope of the application of hedge accounting to include more disclosure of risk management activities. These amendments aim to present information in the financial statements and the impact of hedging activities on the risk management of the enterprise that uses financial instruments and how it uses those instruments in managing its risks (Kund & Rugilo, 2019).

Based upon the most important accounting improvements introduced by IFRS 9, the main differences between this standard and IAS 39 is indicated in Table 4.

Table 4: Main difference among IAS 39 and IFRS 9

Comparison area	IFRS 9	IAS 39
Standard name	Financial instruments	Financial instruments - recognition and measurement
Classification basics	The classification is based on the business model and contractual cash flow characteristics	Contract intent for short term profit, loans, derivatives subject to certain restrictions
Types of classification	• AC • FVOCI • FVTPL	• FVTPL • Held-to-maturity (HTM) • Loans and receivables (LAR) • Available for sale (ASF)

Subsequent measurement	• AC • FVOCI • FVTPL	• FV • AC • Costs (for the share-based instruments, which do not have a reliable fair value measurement)
Classification of debt instruments	• FVTPL • AC	• FVTPL • Instruments available for sale (AFS) • Held to maturity (HTM)
Classification of equity instruments	• FVTPL • FVOCI	• FVTPL • Instruments available for sale (AFS)
Measurement of debt instruments	• They are measured at AC if the objective of the business model is to collect contractual cash flows that are solely repayment of principal and interest on the principal amount outstanding • If not, it is measured at FVTPL	It is measured at AC if it is classified as HTM and for some classifications it is measured on a FV basis
Measurement of equity instruments	They are measured at FVTPL, but an entity may make an irreducible choice on initial recognition for specific investments in equity instruments that are otherwise measured at FVTPL to present subsequent changes in FV in other comprehensive income, provided that there is no intention of trading	They are measured at FV, excluding unquoted shares, investments are measured at cost where fair value is weak in reliability
Embedded derivatives	An embedded derivative is separated from the base contract and measured as a derivative in accordance with this standard if the economic characteristics and risks of the embedded derivative are not closely related to the characteristics and risks of the underlying contract and is measured at FVTPL	They are considered as mixed contracts and are measured at FVTPL

Fair value option	The entity measures the financial asset at FVTPL upon initial recognition only, and after initial recognition the financial asset is measured at AC	An entity measures financial assets measured at FV at initial recognition and is free to do so without regard to other criteria
Reclassification	Change of business model	Reclassification shall be prohibited through profit or loss after initial recognition
Reclassification of debt instruments	If the objectives of the business model change, the reclassification of financial instruments is allowed to be changed from FVTPL to AC or vice versa, provided that those changes are clear to the parties, and this is expected to be rare	Debt is reclassified among the 4 groups specified in the standard under specific circumstances according to the movement of the classifications contained in the standard, and it is reclassified from the date of holding the debt instrument until the maturity date in earnest unless there are exceptions
Reclassification of equity instruments	If the entity reclassifies an instrument between FVOCI to FVTPL measurement category, the instrument continues to be measured at FV and the accumulated gain in comprehensive income from equity is reclassified to profit and loss account on the reclassification date	Reclassification between AFS equity instruments and FVTPL is permitted, when the unrealized gain and loss has been recognized on a FV basis, and when the transfer from FVTPL to AFS instruments does not reflect unrecognized and unrealized gains and losses. All realized gains or losses from AFS instruments are included in profits and losses, adding or deducting shareholders' equity
Impairment	• A unified model of impairment • The ECLs model	• Several models of impairment • The ICLs model

(Source: Huian, 2012; IFRS Foundation, 2014)

It is evident from Table 4 that the main changes introduced by IFRS 9 are observed in the classification and subsequent measurement method of financial instruments, which is in the line with the shift from various models to a discrete and consistent model of impairment through the adoption of the model of ECLs. It is indicated that IFRS 9 tries to simplify the degree of complexity of IAS 39 by eliminating the categories of classification and measuring of financial assets into only two categories which are AC, FVTPL, or FVTCI on the basis of the entity's business model to manage the financial assets, and the characteristics of contractual cash flows of financial assets. This is opposed to IAS 39, which includes four categories of financial assets.

IAS 39 distinguishes between the initial measurement and the subsequent measurement of financial assets and liabilities. The classification of financial assets also plays an important role in their subsequent measurement. For example, IAS 39 stipulates that financial assets classified at FVTPL are measured at FV upon subsequent measurement, with the gain or loss resulting from a change in FV being recognized through profit or loss, with the exception of changes in the FV for financial derivatives classified as hedging instruments for cash flow hedge operations that is accounted for based on hedge accounting requirements are recognized through other comprehensive income.

IAS 39 also stipulates that financial assets classified as available-for-sale should be measured at FV with changes in their FV recognized through other comprehensive income, except for interest computed using the effective interest rate method and recognized through profit or loss; impairment loss; losses of exchange rate changes for financial assets available for sale denominated in foreign currency or their profits; profits and losses recorded in the statement of other comprehensive income resulting from changes in the FV of the financial asset are transferred upon the abandonment or sale of the financial asset available for sale.

On the other hand, IFRS 9 removes what is stated in IAS 39 by including changes in the FV of financial assets in profit or loss as the new standard requires that the gain or loss of a financial asset or liability that are measured at FV to be recognized in other comprehensive income, but IFRS 9 maintains the mechanisms for measuring financial liabilities in accordance with the requirements of IAS 39 as they are initially measured at FV and subsequently at AC. Taking into account the exceptions related to the subsequent measurement of financial liabilities at FVTPL, or those related to financial guarantees or hedge accounting.

While IAS 39 made an exception for derivatives with unreliable measurement of FV and equity instruments that do not have a market price by measuring them at cost, IFRS 9 requires that such instruments to be measured at FV. Furthermore, IFRS 9 removed the division that existed under the IAS 39 as the new standard indicated that the embedded derivatives should not be separated if the host is an asset within the scope of the standard, in addition to evaluating mixed contracts that include one or more embedded derivatives as a single unit according to

the conditions specified by the standard.

Using the same impairment model for financial assets recognized through FVOCI as it does for assets recognized at AC is a major difference of IFRS 9 from IAS 39. However, there is no specific provision account for FVOCI assets, unlike for assets assessed at AC. Gains and losses from impairment are recognized in the revaluation reserve in accumulated other comprehensive income and are deducted from profits or losses.

With regard to impairment model used in both standards, LLP under the ICL approach of IAS 39 is only taken into account when there is “objective evidence” that impairment has existed at the balance sheet date, but the definition of objective evidence provides lots of room for subjective considerations (Dugan, 2009). Additionally, it postponed the recognition of so-called “day-1-losses” that happened instantly after origination but were not realized until the date of balance sheet.

IFRS 9 changed the impairment requirements by replacing the ICLs model under IAS 39 by the ECLs model, as it is no longer necessary for a credit event to be occurred to recognize credit losses, but rather IFRS 9 requires forming a LLP for ECLs upon initial recognition of financial assets based on current expectations of possible credit assumptions in the future, provided that the amount of ECLs is updated at the date of each report to reflect changes in credit risk.

This modification is intended to address the shortcoming of delay in recognizing of credit loss under IAS 39. As a result, the scope for credit loss recognition is expanded beyond the rigid prerequisite of an incurred loss occurrence as a trigger (Gebhardt, 2016; Novotny-Farkas, 2016).

With the implementation of the new impairment model, an increase or decrease of LLP shall be reported on the income statement of the company as a loss or gain, respectively. Recognizing of these provisions might happen significantly more frequently since the new impairment model is based on the long term, or from a forward-looking perspective. As a result, it is not anticipated that the revised impairment model will result in more credit losses being recorded during a recession. Instead, it might change how these identical losses are spread over time, taking a larger proportion of them into account towards the outset of a downturn when default expectations are only beginning to rise.

The transition from ICLs to ECLs changed the type of used information. Knowledge concerning potential losses is not permitted to be used even when it is available under IAS 39. Conversely, the information set that must be taken into account when assessing its expectations of credit losses has been greatly expanded by IFRS 9 by including data from previous events, current circumstances, and relevant forecasts. Therefore, it can be argued that applying the ECLs model is better than applying the ICLs model, as the new standard depends on past and future information, which leads to accurate prediction of risks in a timely manner.

In light of the previous changes made by IFRS 9 on accounting for financial instruments, it is clear that the standard has addressed many of the problems that were caused by shortcomings in the treatments contained in IAS 39.

Based upon the above discussion, there are many advantages of applying IFRS 9. For example, it provides a simple, comprehensive and clear framework for classification and measurement of financial instruments due to its reliance on only two categories based on the entity's business model and cash flow characteristics. Therefore, it can reflect how an entity manages its financial instruments and the contractual cash flow characteristics of the financial assets, and thus depicts how business activities are managed (Kund & Rugilo, 2019).

One of the most important advantages of the implementation of this standard is assisting in reducing risks by creating an allowance for ECLs. It also reflects the impact of the enterprise's risk management activities on the financial statements through the hedging principles with more principle-based requirements. Finally, it could reduce management's judgment as it is based on the purpose of holding the assets rather than the intent to hold the asset as it was in IAS 39 (Novotny-Farkas, 2016).

Despite the previous advantages of the standard, it is criticized by several criticisms. The problem of homogeneity of the elements of the financial statements is still existent as mixed measurement is still present in this standard. The formation of a LLP by ECLs might result in an expansion in the formation of such provision, which in turn might lead to a reduction in equity ratios due to the elimination of general banking risks, which might be reflected in the capital adequacy ratio and the financial performance (Barrios & Papp, 2017).

Moreover, the estimation of ECLs is subject to the personal judgment of the management, which might result in the lack of comparability of financial statements, whether at the level of one bank from one period to another or between banks and each other, as well as this might lead to the fluctuation and instability of business results from one period to another (Plata García et al., 2017). Obtaining information to estimate ECLs might also have a cost due to banks' request for more sophisticated technological programs, and the application of this new standard might require a change in banking systems, which would subsequently increase the bank's burdens and lead to a reduction in its business results (Labatt & Lemonier, 2015).

Due to the changes introduced by IFRS 9 on the accounting for financial instruments, it can have a significant impact on the financial performance of financial institution. Thus, academic researchers are motivated to investigate the impact of IFRS 9 implementation on the financial performance of financial institutions. However, it must be emphasized that there is very little available literature on this topic, particularly in terms of its empirical applications because IFRS 9 has only recently been implemented and banking institutions are only now beginning to apply it. For example, Gebhardt (2016) discussed the decline in Greek government bonds through the application of IAS 39 and IFRS 9 and compare between them through the rules of impairment. The researcher relied upon the data found in the European Bank report during a period from the second half of 2009 to the end of 2011. The researcher revealed that the rules of present value impairment of IFRS 9 is better than the impairment rules of IAS 39 by recognizing ECL earlier and more comprehensively.

Novotny-Farkas (2016) compared between ECL model of IFRS 9 and incurred loss model of IAS 39 on their impact on financial stability. The study relied on the descriptive approach in analyzing data by referring to the financial statements of existing banks in the European Union. They concluded that IFRS 9 could improve financial stability through incorporating greater and earlier allowances of impairment as well as by recognizing of credit losses in earlier times that would lessen the overestimation of regulatory capital and the formation of accumulated losses.

Frykström and Li (2018) discussed the expected impact of IFRS 9 on the financial ratios of Sweden banks. They showed that provisions of credit losses

are expected to be decreased, and this standard will have a little effect on regulatory capital. They also concluded that this standard might contribute to improving risk management and mitigating the periodic fluctuations if the requirements of this standard are applied well through recognizing of credit losses in a reasonable time, and finally this would lead to improving the financial stability and mitigating the shortcomings of IAS 39.

A comprehensive assessment is conducted by Ntaikou and Vousinas (2018) by analyzing the expected impact of the new regime implementation on the functionality and profitability of European financial institutions. They pointed out that banks will put their capital sufficiency above their responsibility to promote credit expansion in the aftermath of the recent financial crisis. Additionally, banks may have a difficult time raising capital during periods of economic depression when loan losses increase and severely impact regulatory capital due to the uncertainty in the economy. Therefore, banks may decide to actively reduce the amount of credit they provide to the real economy, leading to a credit crunch. They claimed that one of the main advantages of the new standard is that it prevents the rapid increase in loan provisions and the gradual and early recognition of ECLs for loans. The ECLs approach is therefore harmful to the restoration of financial stability.

It should be emphasized that there are big auditing firms that have done studies to gauge the actual effect of the implementation of the aforementioned standard. For example, Deloitte (2019) analyzed the initial impact of implementing IFRS 9 on the financial performance and financial positions of the big UK banks in 2019 after a year of implementing of IFRS 9. This study found that financial results of these institutions are not significantly affected at the first of transformation and implementing on 1 January 2018, and this continues during the year of 2018 with a slight increase in crediting and a decrease in impairment provisions to a high degree in accordance with the requirements of IFRS 9 as a result of the amounts of money that are executed in the third stage.

Kund and Rugilo (2019) investigated the effects of impairment model of IFRS 9 on the financial stability through using the stress test of a sample of 43 European banks during the period from 2014 to 2018. They indicated that applying IAS 39 resulted in sudden increase in impairment of the value as the losses are recognized only when they are incurred and this is

cliff-effect, and hence losses happened suddenly and lately. IFRS 9 treats this problem by recognizing losses over the life of the loan and this is front-loading. The joint impact of both of these influences is that the transformation to apply IFRS 9 negatively affects the bank resilience by lessening levels of capital. It can be summarized that gradual recognition of loss in accordance with IFRS 9 will decrease the impact of sudden recognizing of loss on the count of early recognizing of loss and this leads to a decrease in the fluctuation of decrease in value. In addition, the early recognition of loss might decrease the banks' abilities to retain earnings and capital cannot be increased by retained earnings.

Mahendrarajah et al. (2019) investigated the effects of the most recent impairment model formed under IFRS 9 on how well the Sri Lankan Banking Sector (SLBS) performed in terms of facilitating SME loans. They focused on secondary information gathered from resources including annual reports of banks, as well as annual reports and financial sector stability report issued by Central Bank of Sri Lanka (CBSL), etc. They employed a deductive methodology, wherein justifications are primarily linked to theoretical elements supportable by empirical data. With rising NPLs and provisioning, the asset quality of the banking industry, particularly in the SME sector, has severely declined recently. Additionally, the researchers noted that during this study period, the banking sector's performance in Sri Lanka declined. In addition to the aforementioned factors, the new reporting standard's revenue recognition and impairment provisioning techniques have further decreased the profitability of the nation's banking industry.

Moutinho (2019) used an empirical approach to assess the impact of IFRS 9 on financial stability using databases from Pordata, the ECB, the World Bank, the United Nations, and the OECD for 23 European Union member nations plus the United States from 2008 to 2017. They found that the new standard requirements directly and positively affect economic stability, but only if banks consistently and strictly implement them.

Gornjak (2020) reviewed the empirical research on the IFRS 9 accounting of financial instruments. He concentrated on the most popular research in each area of this new standard that is currently publicly available after the implementation of IFRS 9 took place. He concentrated on the effect on profit and loss as well as on the requirements of bank capital. In his opinion, IFRS 9 could increase financial stability and

lessen pro-cyclicality during economic downturns. The influence of impairment on profit and loss should be less in good economic circumstances than during a recession as a major deterioration in the credit risk during this period necessitates the computation of lifetime ECL rather than 12-month ECL. The statement of profit or loss at the time of replacement and afterwards, as well as the capital requirements and the value of shareholders are all impacted by the accounting for ECL provisions.

Khersiat and Alkabbji (2020) examined the effect of applying the standard IFRS 9 on the profits and losses of 23 Jordanian insurance companies listed on the Amman Stock Exchange for the fiscal year of 2019 through employing the analytical descriptive methodology. They showed that there is a statistically significant impact for the application of the standard IFRS 9 standard on profits and losses of insurance companies.

A Moroccan public financial institution with 145 subsidiaries across all lines of business and industrial sectors was the subject of an empirical study by Bellagdid et al. (2021) to determine the influence of IFRS 9 on its financial performance. They utilized a reclassification model, implemented it for all financial instruments on the sample institution's financial statements. In order to evaluate the effect on financial performance, they set up a comparison study between real and simulated events. They pointed out that the Group's profitability, and hence its financial performance, has improved following the shift from IAS 39 to IFRS 9.

Besmir et al. (2021) compared data from financial statements and notes as of 31 December 2017 and 31 December 2018 to examine the day-one transition effect of IFRS 9 on the level of assets balance, allowance for loan losses, and capital regulatory class II for the six largest commercial banks in Kosovo before and after adopting IFRS 9. The findings suggest that assets and capital regulations are not greatly impacted by the transition phase, but IFRS 9 significantly affects the recognition of further loan impairment. Results also show that the transition to IFRS 9 results in capital instability and re-consolidation, but it lessens the likelihood of significant and unexpected losses in the long run.

It can be indicated that most of these studies conducted during the periods before applying this new standard and therefore they might not check such aspects empirically as the standard was

not applied, and they depend upon simultaneous quantitative analysis, whereas the investigations during the period after applying this standard focused on the expected credit losses and its impacts on financial stability. None of the previous studies have conducted a time-series analysis to study the effect of the transition to the implementation of IFRS 9 in the banks' performance. It is also noticed that most of previous studies have not concentrated on emerging countries.

From what has been discussed above, it can be argued that the application of IFRS 9 might result in a significant change in the strategy of risk management, and hence might lead to a substantial change in the financial performance of financial institutions. With regard to this impact, there are two different viewpoints.

The application of IFRS 9 might avoid significant losses that banks experienced due to the delay in recognizing the loan losses until they were validated under IAS 39. As a result, banks would carry over a portion of their losses from year to year until they accumulated. Due to the lack of provisions to address the potential losses, banks would suffer significant losses. Due to the possibility of any financing or debt defaulting, IFRS 9 offered a new model in dealing with such losses by assessing provisions even for the debts (Khersiat & Alkabbji, 2020).

Alternatively, the application of ECLs under IFRS 9 might result in fluctuations in profits and losses as credit losses of all financial instruments and not of these related to loss are recognized. This model also depends upon external information as basic factors to assess credit losses. In addition, the transition from 12-month ECLs to lifetime ECLs of financial instruments might give rise to numerous changes in loss provisions, and the early recognition of credit losses might lead to forming high loss provisions, affecting some items of financial statements and consequently influencing the financial performance of banks (Ntaikou & Vousinas, 2018).

Given the mixed results of the impact of IFRS 9 on the performance of banks and the lack of such studies in emerging countries, this paper examines the Cambodian scenario, as the commercial banks in this country have different regulatory settings than these in the countries where the previous studies are applied.

Although the performance of Cambodian banks is under scrutiny, the country's banking sector has

grown quickly in recent years. To ensure the effective mobilization and appropriate allocation of both domestic and international funds, the Cambodian government has continuously carried out structural changes in the financial sector. Despite the fact that the Cambodian economy appears to be entering a phase of stable expansion, more work needed to be done to change its economic structure and improve the effectiveness of market mechanisms. From this point of view, improving the banking sector's operations was crucial for the continued growth of the economy (Aiba & Hidenobu, 2021).

Since the late 2000s, the size of the Cambodian banking sector has been quickly growing, supported by good macroeconomic conditions. The Cambodian central bank, which is called the National Bank of Cambodia (NBC), has been working hard to enhance the banking industry's operations while advancing deregulatory measures to create a freer market (Aiba & Hidenobu, 2021).

These banks, however, have numerous issues. Due to their high liquidity holdings, commercial banks' intermediation operations are inefficient. Additionally, because the Cambodian economy is heavily dollarized, Cambodian banks have a sizable quantity of excess reserves (Delechat et al., 2012). The effectiveness of the financial operations of the commercial banks in Cambodia has been considerably lowered by these circumstances. Thus, it is vital to study whether the financial performance of Cambodian commercial banks has been affected by the application of IFRS 9.

With regard to the adoption of IFRS in Cambodia, National Accounting Council (NAC) was established in 2002 under the Ministry of Economy and Finance of the Royal Government of Cambodia by the Law on Corporate Accounts, their Audits, and the Accounting Profession to set and regulate accounting and auditing standards. In 2012, the Cambodian Accounting Standards Board of the NAC fully adopted all IFRSs, including IASs, and all interpretations made by *International Financial Reporting Interpretation Committee (IFRIC)* without modifications. The standards were thereby renamed Cambodian International Financial Reporting Standards (CIFRS). The Ministry of Economy and Finance approved these standards for application in the jurisdiction through proclamations (Prakas No. 068 MEF/BK and No. 097/09 MF-NAC). The date for application of full IFRS Standards in Cambodia was set for periods beginning on or after 1 January 2012.

In line with the issuance of IFRS 9, CIFRS 9 *Financial instrument replaces CIAS Financial instruments: Recognition and Measurement* for annual periods beginning on or after 1 January 2018. The financial performance of Cambodian commercial banks is expected to be influenced by the implementation of CIFRS 9. Based upon the above arguments and the results of previous studies, the following hypothesis is developed:

H1: The financial performance of Cambodian commercial banks is influenced by the implementation of CIFRS 9.

DATA AND METHODOLOGY

Sample

The data employed in this research are extracted manually from the annual reports of a sample of Cambodian commercial banks. Due to the availability of data, only 19 individual banks and 152 firm-year data during the period from 2014 through 2021 are focused on this study. A panel dataset of 152 bank-year observations is employed in this investigation. There are many benefits of employing panel data analysis. It increases the effectiveness of econometric estimations by providing a high degree of freedom, a big amount of data points on each sample item and minimizing the issue of multicollinearity among the research variables (Hsiao, 2014).

Variables

Dependent Variable

Return on equity (ROE), which is calculated by dividing net income by the total equity of the company, is used to measure financial performance. Another indicator of financial performance is the return on assets (ROA), which is computed by dividing net income by the total assets' book value. These two indicators have been frequently employed to assess the performance of banks (e.g., Ahmadi et al., 2018; Duppati et al., 2019; Erhardt et al., 2003; Fernández-Temprano & Tejerina-Gaite, 2020; Low et al., 2015; Terjesen et al., 2016).

Independent Variable

In order to measure the impact of the adoption of IFRS 9, a dummy variable is employed, where the value of "1" for data of the years after the implementation of this standard and "0" for data of the years before the application of this standard.

Control variables

Some of specific characteristics of banks are included as control variables in order to take into consideration their possible confounding influences. Firstly, Bank size (SIZE), which is calculated by the natural logarithm of the book value of total assets, is included (Almutairi & Quttainah, 2017; John et al., 2016). A large bank is distinguished by its wide range of skills, capacity to benefit from scale economies. These attributes enable large banks to improve their performance in comparison to small banks by making operations more efficient. Dogan (2013) and Lee (2009) documented that there is a positive link between firm size and financial performance.

Secondly, leverage (LEV), which is the proportion of total liabilities to total equity, is also involved (Arora & Sharma, 2016; Peni & Vähämaa, 2012). High indebtedness might be related to better performance by preventing bankruptcy (Damodaran, 2010). Majumdar and Chhibber (1999) and Berger and Udell (2006) empirically supported this claim. Thirdly, the ratio of the banks' credit (LTA), which is calculated as the proportion of total loans to total assets, is one of the control variables in this study model (De Andres & Vállelado, 2008). Since loans make up a large portion of the bank's entire asset structure, a high LTA suggests a strong bank performance. Saeed (2014) demonstrated how LTA had a favorable impact on bank performance.

Fourthly, the deposit financing ratio (DTA), which is assessed by dividing the total deposits by total assets, is another factor that is taken into consideration (Aebi et al., 2012). Since deposits are regarded as the primary source of the financing of the bank, this rate is involved. Gul et al (2011) demonstrated that deposits and bank performance are positively correlated. Lastly, the capitalization of the bank is shown by the capital ratio (ETA), which is defined as a ratio of equity over average total assets (Ghosh, 2017). High ETA indicates the significant role the owners played in pressuring the management to boost the performance of the bank. Rumler and Waschiczek (2016) revealed that ETA significantly improves bank performance. The research variables and the way of their measurement are shown in Table 5.

Table 5: Research variables and their measurement methodology

Variable	Abbreviation	Measurement
Financial performance 1	ROE	Return on equity

Financial performance 2	ROA	Return on assets
Standard	IFRS9	Dummy variable represented by "1" for data of years after the application of IFRS 9, "0" otherwise
Bank size	FSIZE	Natural logarithm of total assets
Leverage	LEV	Ratio of total liabilities to total equity
Credit performance	LTA	Ratio of total loans to total assets
Deposit financing	DTA	Ratio of deposits to total assets
Capital	ETA	Ratio of equity to average of total assets

Empirical Modeling

The following models are developed to examine the impact of IFRS 9 implementation on the financial performance of banks:

$$ROA = \alpha + \beta_1 IFRS9_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 LTA_{i,t} + \beta_5 DTA_{i,t} + \beta_6 ETA_{i,t} + \varepsilon_{i,t}$$

$$ROE = \alpha + \beta_1 IFRS9_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 LTA_{i,t} + \beta_5 DTA_{i,t} + \beta_6 ETA_{i,t} + \varepsilon_{i,t}$$

where *ROA* = return on assets; *ROE* = return on equity; *IFRS9* = a dummy variable represented by "1" for data of years of the application of IFRS 9, "0" otherwise; *SIZE* = natural logarithm of total assets; *LEV* = total liabilities divided by total equity; *LTA* = Ratio of loans to total assets; *DTA* = total deposits divided by total assets; and *ETA* = total equity divided by average total assets.

FINDINGS AND DISCUSSION

This section consists of three parts. Firstly, description of statistics of the research variables is presented, and then the correlation matrix between research variables is shown. The final part presents the regression findings about the relationship between the adoption of IFRS 9 and financial performance in light of the proposed and illustrated hypothesis.

Descriptive Statistics

Table 6 presents the descriptive analysis. The average of *ROA* and *ROE* are 0.02 and 0.12 respectively and *ROA* ranges from -0.08 to 0.29, while *ROE* ranges from -0.45 to 0.39. Both measures are reasonably similar, and this proves that these two proxies validate similar conclusion.

The *SIZE* of sampled banks ranges between 17.53 and 22.8, while the mean and standard deviation of the size of these banks are 20.35 and 1.24. This indicates

there is no big difference in the size of the Cambodian commercial banks included in the sample. At the same time, sampled banks experience high disparity in the level of leverage as the minimum and maximum values of *LEV* are 0.02 and 11.32, correspondingly.

The mean value of *LTA* is higher than the mean value of *DTA*, demonstrating that the sampled banks pay higher attention to credit performance than deposit financing. Lastly, *ETA* ranges among 0.02 and 1.53, its mean value is 0.22, and the standard deviation is 0.23. This shows that there is no big divergence in the capital structure among the sampled banks.

Table 6: Descriptive Statistics

	N	Mean	Min	Max	St.Dev.
ROA	152	0.0216	-0.0803	0.2924	0.0270
ROE	152	0.1168	-0.4525	0.3891	0.0925
IFRS9	152	0.5	0	1	0.5017
SIZE	152	20.3532	17.5302	22.7978	1.2402
LEV	152	5.0613	0.0246	11.3178	2.4552
LTA	152	0.6268	0.0446	0.9686	0.1515
DTA	152	0.5758	0.0122	0.8846	0.2349
ETA	152	0.2236	0.0203	1.5300	0.2280

Unit Root Test

The Levin–Lin–Chu test is applied to examine whether the series contains a unit root. It is shown in Table 7 that the panel dataset is not stationary since the p-values for dependent variables are significant.

Table 7: Unit root test

	ROA	ROE
Unadjusted t	-13.1844	-8.9516
Adjusted t	-10.3710	-6.9901
P-value	0.000	0.000

Pairwise Correlation

In Table 8, pairwise correlation is conducted to show the direction of the association between the research variables and to check the multicollinearity. If the coefficient value is more than 0.80, multicollinearity issue might be detected in study analysis (Gujarati, 2022). With the greatest coefficient of 0.709, which is located between the *ETA* and *LEV*, it can be observed that multicollinearity is therefore not a problem in this investigation.

It can be shown that the implementation of IFRS 9 has a negative impact on the financial performance of Cambodian banks as both of *ROA* and *ROE* are negatively and significantly correlated with IFRS 9.

Both of *SIZE* and *DTA* have a positive and significant correlation with both of *ROA* and *ROE*, indicating that Cambodian commercial banks with bigger size and higher deposits experience better financial performance.

Table 8: Pairwise correlation

	ROA	ROE	IFRS9	SIZE	LEV	LTA	DTA	ETA
ROA	1							
ROE	0.6161***	1						
	0.0000							
IFRS9	-0.1360*	-0.1354*	1					
	0.0947	0.0962						
SIZE	0.2278***	0.4183***	0.3026***	1				
	0.0048	0.0000	0.0002					
LEV	0.0970	0.4343***	-0.0418	0.6191***	1			
	0.2347	0.0000	0.6093	0.0000				
LTA	0.0771	0.1957**	0.1212	-0.0935	-0.0215	1		
	0.3449	0.0157	0.1370	0.2520	0.7924			
DTA	0.1974**	0.4361***	0.0709	0.6219***	0.6591***	-0.1497*	1	
	0.0148	0.0000	0.3856	0.0000	0.0000	0.0657		
ETA	-0.1035	-0.3302***	0.5151***	-0.2410***	-0.7093***	-0.0155	-0.4679***	1
	0.2043	0.0000	0.0000	0.0028	0.0000	0.8499	0.0000	

Note: ***, ** and * indicate that the variable is significant at 0.01, 0.05 and 0.10, respectively.

Multivariate Regression Analyses

Table 9 shows the ordinary least squares (OLS) regression findings on the impact of IFRS 9 adoption on financial performance as evaluated by *ROA* and *ROE* in conjunction with the control variables. Four regression models are tested for each performance measurement. The reliability of the results is improved by comparing the output of the two financial performance indicators.

Models 1 and 5 present the OLS regression between the performance of the bank and the control variables. The findings show a substantial positive association between *SIZE*, *LTA*, *DTA*, and *ETA* and bank performance as determined by *ROA* or *ROE*. This is in accordance with (Dogan, 2013; Gul et al., 2011; Saeed, 2014; Lee, 2009; Rumler & Waschiczek, 2016). *LEV* does not considerably affect *ROA*, but it has a significant and positive influence on *ROE*. The R-squared of Model 1 (0.217) is lower than this of Model 5 (0.434), suggesting that the control variables included in this study can explain 21.7% of *ROA* and 43.4% of *ROA*.

The variable of the adoption of IFRS 9 is included in the remaining models in table. The banks' performance is assessed using *ROA* in Models 2, 3, and 4, while *ROE* is used to assess their financial performance in the final three models.

The association between IFRS9 and ROA in Model 2 is negative and significant, demonstrating that the financial performance of Cambodian commercial banks has been weakened after the adoption of this new standard. The same regression analysis is done in Model 6, but the banks' performance is measured by ROE rather than ROA. The results are largely the same, indicating that IFRS9 has a substantial negative correlation with ROE. The consistency of the results between the two models shows that the implementation of this new standard has had no different effects on bank performance, whether performance assessed either by ROA or ROE. The key difference here is that the R-squared in Model 6 is higher than this in Model 2, indicating that variables included in this study explain more ROE than ROA.

Robust regression estimation of the Model 2 regression is run in Model 3. In this regression, the IFRS 9 implementation variable yields results that are similar to the primary baseline result in Model 2. Therefore, it can be said that the results are the same under different regression estimating methods. However, LTA, DTA, and ETA in this model have

insignificant relationship with ROA in contrast to their significance in Model 2. Additionally, in Model 7, the same regression analysis of Model 3 is performed using the banks' performance as assessed by ROE rather than ROA, and the analysis yields comparable results.

Further tests are conducted using the random effect regression model, which is shown in Model 4 by measuring bank performance by ROA and in Model 8 by employing ROE as a measure of bank performance. The outcomes of the analysis for the whole variables support the conclusions of the prior models, demonstrating the validity of the results.

Although the Cambodian commercial banks with better financial performance are characterized with high ratios of credit and deposit financing, the adoption of IFRS 9 has negatively impacted the profitability of Cambodian banks. This might be related to the formation of LLP with higher extent due to the application of the new ECLs model stipulated by the new standard, and this might influence the figures of earnings of these banks.

Table 9: Regression results on board diversity and financial performance

	IFRS9 and financial performance (ROA)				IFRS9 and financial performance (ROE)			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
	Pooled OLS	Pooled OLS	Robust	Random Effect	Pooled OLS	Pooled OLS	Robust	Random Effect
	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.
	(t-stat)	(t-stat)	(t-stat)	(z-stat)	(t-stat)	(t-stat)	(t-stat)	(z-stat)
IFRS9		-0.0224216***	-0.0224216***	-0.0185512***		-0.1249417***	-0.1249417***	-0.0987951***
		0.000	0.001	0.002		0.000	0.000	0.002
SIZE	0.0047419***	0.0049747***	0.0047419***	0.0034516**	0.0258024***	0.0258024***	0.0258024***	0.0191431**
	0.000	0.000	0.000	0.027	0.000	0.000	0.000	0.034
LEV	-0.0005583	-0.0006784	-0.0005583	-0.0005485	0.0086738*	0.0086738*	0.0086738**	0.0094231*
	0.522	0.447	0.497	0.547	0.065	0.065	0.031	0.061
LTA	0.0227074***	0.021725***	0.0227074	0.0277653***	0.2235309***	0.2235309***	0.2235309***	0.2084635***
	0.006	0.01	0.102	0.003	0.000	0.000	0.000	0.000
DTA	0.015397**	0.015216**	0.015397	0.0193437**	0.1293104***	0.1293104***	0.1293104***	0.1243519***
	0.027	0.029	0.116	0.018	0.001	0.001	0.001	0.008
ETA	0.047349**	0.0454893*	0.047349	0.0313377	0.3245875***	0.3245875***	0.3245875***	0.2314588*
	0.046	0.057	0.16	0.173	0.011	0.011	0.001	0.063
Year effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.0969519	-0.0969519	-0.0969519	-0.0751819	-0.6612895	-0.6612895	-0.6612895	-0.5127784
	0.000	0.000	0.000	0.011	0.000	0.000	0.000	0.003
N	152	152	152	152	152	152	152	152
F/Wald Chi ²	3.22	3.22	5.66	30.71	8.88	8.88	11.03	65.8
Prob > F	0.0004	0.0004	0.000	0.0022	0.000	0.000	0.000	0.000
R-squared	0.2173	0.2173	0.2173	0.2005	0.434	0.434	0.434	0.427

Note: ***, ** and * indicate that the variable is significant at 0.01, 0.05 and 0.10, respectively.

CONCLUSION

In the aftermath of the 2008 global financial crisis, many criticisms were leveled against the accounting standard for financial instruments—which was IAS 39. It was argued that this standard was the main reason of this crisis because the ICLs model adopted by this standard had led to late recognition of losses. This encouraged many international bodies to call standard setters to issue a new standard that focuses on the recognition of LLP based upon forward looking information. In 2014, the IASB issued IFRS 9 to be initially applied on 1 January 2018 with permission of early application. This standard has introduced many changes to accounting of financial instruments, the most important of which are the application of ECLs in recognizing LLP that allow the early recognition of credit losses before they occur. Also, the ways in which the financial assets and liabilities are measured and classified have been improved. In view that these developments have important implications upon the banking sector in any developing economy, this study has examined the impact of the adoption of IFRS 9 on the financial performance of Cambodian commercial banks.

This study's accounting data were manually extracted from the annual reports of 19 individual Cambodian commercial banks over an eight-year period ranging from 2014 to 2021. This has allowed us to compare the financial performance four years before and four years after the application of this new standard. We conducted multivariate regression analyses for the extracted data and we found that the implementation of IFRS 9 has negatively influenced the financial performance of the sampled banks.

This study is not without limitations. Firstly, the data of this study were only drawn from commercial banks in one country—i.e., Cambodia. Future research can consider examining the influence of the new standard on commercial banks' financial performance of various countries with different regulatory characteristics for more meaningful comparisons. Secondly, since this study's focus is solely devoted to the financial performance of commercial banks, future research can be directed towards analyzing the influence of IFRS 9 on the quality of earnings and the value relevance of accounting information. Lastly, although we considered the four years post IFRS 9 implementations (i.e., from 2018, 2019, 2020 and 2021), we did not analyze the last two years (i.e., from 2020 and 2021) from the context of the COVID-19 pandemic. Thus, the impacts of such

pandemic as signaled through, for example, higher amounts of bad debts amongst commercial banks in Cambodia remains underexplored. Future research may address this gap.

Despite the limitations indicated above, this study has made several literary and practical contributions. Indeed, it contributes significantly to the literature on financial instruments by providing empirics on a developing country, i.e., Cambodia. This study fills a research gap about IFRS 9's effects by highlighting how the adoption of the new standard affects the financial performance of Cambodian commercial banks. This study can be considered to be one of the first studies that depends upon real numbers of financial performance of banks after the application of this new standard as most of previous studies of this issue depend upon simultaneous numbers and are applied before the implementation of IFRS 9.

In terms of practical contributions, this study compares the performance of the Cambodian commercial banks before and after this new standard was applied. It also provides useful information for the state authorities in charge of developing standards regarding the impact of the choice to transition to the newly issued standards in emerging economies.

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The Past, Present and Future of Measuring Customer Satisfaction with Artificial Intelligence and Machine Learning

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ABSTRACT

This article briefly sketches the evolution of Customer Satisfaction (C-Sat) measurements from a historical point of view and contributes to the future discussion from both academic and practitioner point of views. Firstly, this article argues that traditional methods of measuring C-Sat do not adequately meet current business needs. Secondly, this article suggests that Artificial Intelligence (AI) and Machine Learning (ML) tools and algorithms are capable of complementing or even replacing traditional C-Sat measurements and are even able to help predicting C-Sat before customers themselves enter a transaction. A global managerial survey confirms these propositions.

Keywords: Customer satisfaction; CES; NPS; Artificial Intelligence; Machine Learning

INTRODUCTION

In the last few decades, organizations have been relying heavily on survey-based traditional customer satisfaction (C-Sat) measurements such as service quality, customer effort score (CES) or net promoter score (NPS). These are inadequate for current business needs for several reasons. First, they are mostly descriptive and cross-sectional and are based on small and often biased sample groups. Secondly, these measurements don't truly reflect the volatility in customer experience in a multi-channel and multi-platform environment in which customers interact with firms. These interactions occur across multiple channels and reflect customer impressions in many varied social media and review sites. Finally, there is often a significant time lag between measurements and improvement actions which makes it challenging to recover customer dissatisfaction or adjust the problematic processes in a timely fashion. Therefore, marketing scholars and practitioners are in search of new methodologies that make use of Artificial Intelligence (AI) and Machine Learning (ML) tools to understand customer insights across different channels and online platforms. AI & ML tools can provide relevant insights and predictions based on firms' internal data from Customer relationship Management (CRM) and Enterprise Resource Planning (ERP) systems as well as on external data from customers' online activities such as searching, browsing, and contributing to social media and review

platforms. Analyzing this type of internal and external data thus offers new opportunities for diagnosing potential issues, predicting likely outcomes, and prescribing actionable insights which can help firms observe and predict likely C-Sat before customers even experience a (dis)satisfactory event.

Historical developments in customer satisfaction research and measurement

Customer satisfaction has been the object of academic interest for several decades. In early academic research, Flanagan (1954) introduced the critical incident technique to determine C-Sat items and customer requirements. Word-of-mouth (WoM) is defined as an important factor in C-Sat and purchase decisions (Whyte, 1954; Arndt, 1967). Katona (1975) suggested that C-Sat not only depends on the quality of the product, but also the expectations of the customers. Churchill and Surprenant (1982) advocated the idea of C-Sat needs being the center of marketing practice and consumer research, since satisfying the customers has some obvious benefits, such as saving money and increasing revenue, as well as bringing new and repeat business. Parasuraman et al. (1988) in their SERVQUAL model established the link between service quality and C-Sat with five dimensions: tangibles, reliability, responsiveness, assurance, and empathy. Based on this model, Cronin and Taylor (1992) proposed the SERVPERF model which abandoned the difference analysis method and directly measured the customer's perceived service performance.

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Following ongoing service satisfaction research, Bolting (1989) investigated the way customers express dissatisfaction and what service marketers can do about it. Hart et al. (1990) suggested that service recovery is fundamental to service excellence and should, therefore, be regarded as an integral part of company strategies. Rust and Zahorik (1993) and Anderson et al. (1994) researched the relationship between C-Sat, customer retention, market share and customer loyalty. Service quality is traditionally defined as the difference between expected and perceived service performance and is assessed by how customers perceive service offerings (Parasuraman et al., 1994; Cronin & Taylor, 1994). Heskett et al. (1997) introduced the service profit chain which linked profit and growth to loyalty, satisfaction, and value.

Oliver (1997) stated that the most frequent customer response to both satisfying and dissatisfying transactions was for the customer “to do nothing, absolutely nothing.” As similarly argued by Birgelen et al. (2000) “in the modern context of tremendous information availability through advances in information technology and research practice, use of customer satisfaction-related information does not always appear to be optimal.” Referring to Mulder (1999), they noted that “decision-makers get frustrated when it turns out that, despite repeated measurement and attention for quality-related issues, no changes in customer satisfaction levels are evident.”

In order to quickly measure C-Sat, sales growth and loyalty intentions, Reicheld (2003) introduced The Net Promoter Score (NPS) as “the one number you need to grow”, seemingly as a derivative concept based on WoM with a single question: “How likely are you to recommend us to others?” Scores between 0 and 6 are considered detractors, 7 and 8 as passively satisfied, and 9 and 10 as promoters. NPS is the percentage of promoters minus detractors. Morgan and Rego (2006) examined commonly used and widely advocated customer feedback metrics and found that average satisfaction scores have the greatest value due to their ability to predict future business performance. Their research also indicated that prescriptions to focus customer feedback systems and metrics solely on customers’ recommendation intentions, such as NPS, are misguided. Furthermore, longitudinal research conducted by Keiningham et al. (2007) did not find evidence that monitoring NPS leads to customer loyalty or increased financial performance.

While debate continued about which metric is most helpful for measuring C-Sat, Güngör (2007) found empirical evidence suggesting that frontline employees can observe C-Sat with a very high degree of accuracy, especially when customer interactions are remarkably negative or positive. The average frontline customer service agent e.g., in a call center, can easily interact with 8-10 customer per hour, more than 60 per day, more than 300 per week and up to 15.000 customers per year (Güngör, 2010). And this number is much more than an average business intelligence unit collects as feedback with traditional C-Sat surveys. Hence, collecting C-Sat information from frontline employees could potentially be more efficient and more effective than traditional customer surveys.

Güngör (2009) analyzed 850 retail banking customers in the United Kingdom and revealed that when determining NPS calculations, passively satisfied customers (7-8) are erroneously separated from promoters (9-10) since no significant differences exist in the loyalty intentions of these two groups (analysis of variance, $p > .80$). Furthermore, although recommendation and loyalty intentions are positively correlated ($r = 0.41$, $p < 0.01$), low recommendation scores do not necessarily indicate customer defection since only less than 25% of so-called detractors were intending to leave their bank. Consequently, this research suggests that the likelihood of recommendation might be one indicator of C-Sat or loyalty intentions but the relationship between customer loyalty and NPS might be a “false alarm”.

It is interesting to observe that while criticism of NPS was growing among scholars, more than two thirds of Fortune 1000 firms across numerous industries were applying NPS to their business (Kaplan, 2016). This is possibly because NPS is easy to understand and its methodology is easy to implement with only “one” question. The popularity of this single-item metric to shed light on the customer experience has led to another easily explainable model with a single question: Dixon et al. (2010) introduced the Customer Effort Score (CES) and argued that it is a better predictor of satisfaction or loyalty than C-Sat questions. CES measures the amount of effort a customer has to exert to get an issue resolved, a request fulfilled, a product purchased/returned, or a question answered. Wiesel et al. (2012 and 2015) compared different customer metrics – namely C-Sat, NPS, and CES – to test their ability to predict retention across a wide range of industries and concluded that the different customer metrics differ depending on

the industry and the unit of analysis; and combining different metrics improves predictions about customer retention.

Güngör (2017) analyzed C-Sat and loyalty intentions with a large SERVQUAL dataset obtained from 3.581 customers from 66 Cambodian companies in six different industries. Five popular C-Sat and loyalty metrics were used as dependent variables: overall satisfaction, customer effort, recommendation, loyalty and repurchase intentions. Correlations (Table

1) among these variables varied between 0.722 and 0.798 ($p < 0.01$) with a very high internal consistency (Cronbach alpha, 0.94). Linear regression analysis showed that recommendation was the strongest predictor of overall C-Sat with ($r = 0.795$, $p < 0.01$) and explained 63% of the variance. These results indicated that measuring recommendation might show similar results as overall satisfaction, especially when scores are collected and analyzed without manipulation e.g., without creating so-called ‘promoter’ or ‘detractor’ subgroups.

Table 1: Correlations among popular C-Sat and customer loyalty related questions

		OverallSatisfaction	CustomerEffortScore	Recommendation	LoyaltyIntention	RepurchaseIntention
OverallSatisfaction	Pearson Correlation Sig. (2-tailed) N	1 .000 3581	.787** .000 3581	.795** .000 3581	.723** .000 3581	.751** .000 3581
CustomerEffortScore	Pearson Correlation Sig. (2-tailed) N	.787** .000 3581	1 .000 3581	.775** .000 3581	.722** .000 3581	.727** .000 3581
Recommendation	Pearson Correlation Sig. (2-tailed) N	.795** .000 3581	.775** .000 3581	1 .000 3581	.768** .000 3581	.798** .000 3581
LoyaltyIntention	Pearson Correlation Sig. (2-tailed) N	.723** .000 3581	.722** .000 3581	.768** .000 3581	1 .000 3581	.778** .000 3581
RepurchaseIntention	Pearson Correlation Sig. (2-tailed) N	.751** .000 3581	.727** .000 3581	.798** .000 3581	.778** .000 3581	1 .000 3581

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

Weber and Chatzopoulos (2019) research, looked at the differences between digital and non-digital customer experiences, and showed that while C-Sat scores remain flat in one channel, recommendations could decline in another, indicating potential discrepancies in different metrics between online and offline channels. Bjorn (2020) measured five different customer journeys in the automotive industry in the Netherlands and found that C-Sat, Recommendation (NPS), and CES are interrelated; namely, customer satisfaction leads to customer recommendation and this relationship is mediated by customer efforts.

In sum, there are inconsistent findings and recommendations about C-Sat measurements and about NPS in particular (Klie, 2020; Baehre et al., 2021). Even the creator of the NPS (Reichheld et al., 2021) admitted that “NPS started to be gamed and misused in ways that hurt its credibility.” Consequently, and unsurprisingly, one-third of customer service and support leaders are either unsure or disagree that NPS is valuable to customer service. It’s predicted that more than 75% of organizations will abandon NPS as a measure of success for customer service by 2025 (Gartner, 2021).

Artificial Intelligence (AI) And Machine Learning (ML) in Marketing and Service Research

There is a growing interest in AI & ML in marketing and service research in order to understand, design and deliver personalized service and offerings as well as understanding customer satisfaction (Syam & Sharma, 2018; Chaffey, 2019; Grewal et al., 2020; Stone et al., 2020; Mustak et al. 2021; Verhoef et al., 2021). Huang and Rust (2018, 2021, 2022) defined a strategic framework for AI in marketing, incorporating multiple AI benefits: mechanical AI for automating repetitive marketing activities, thinking AI for processing data to arrive at decisions, and feeling AI for analyzing customer interactions and emotions. Mariani et al. (2021) provided an integrated view on AI in marketing, consumer research, and psychology literature, identifying major clusters such as big data, AI, ML, data mining, and neural networks.

Artificial Intelligence is an umbrella term for various methodologies designed to provide computers with human-like abilities of hearing, seeing, reasoning

and learning to support the replication of human analytical and/or decision-making capabilities (Güngör, 2020). Kaplan and Haenlein (2019) defined AI as a system's ability to correctly interpret external data, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation. The mega trends leading to the rise of AI, according to Burgess (2018), are the role of big data, the availability of cheap storage, faster processors, Internet connectivity and connected devices, developments in machine learning and the prevalence of cloud AI from tech giants like Google and Amazon.

Machine Learning is the use of mathematical procedures (algorithms) to analyze data and identify useful patterns (relationships or correlations) between different items and learn from them. Once the relationships are identified, they can be used to make inferences about the behavior of new cases when they are present (Finlay, 2018). There are three major types of ML widely used in business: *Supervised learning* algorithms train systems using examples classified (labelled) by humans, *unsupervised learning* algorithms explore input data without being given an explicit output variable and to discover patterns in unlabeled data, and *reinforcement learning* algorithms learn to perform tasks simply by trying to maximize rewards they receive for their actions.

Deep learning is a type of ML that trains a computer to perform human-like tasks, such as recognizing speech, identifying images or making predictions (SAS, 2018). Artificial **Neural Networks**, as part of deep learning (Nevala, 2017; Nvidia, 2017), try to learn tasks mimicking the behavior of brain; and are increasingly used to measure and predict C-Sat and loyalty drivers (Ansari & Riasi, 2016; Kalinic et al., 2021).

AI & ML can indeed support companies offering important customer benefits, such as advice with recommender systems, peace of mind with smart household products, and convenience with voice-activated virtual assistants (Puntini et al., 2021; Pitardi & Marriott, 2020). Sales and service employees are also increasingly augmented with AI-based tools and software (Davenport et al., 2020; Henkel et al., 2020).

AI & ML tools are leading to new avenues in understanding and predicting C-Sat and loyalty intentions – by utilizing internal and external data source

Aksoy et al. (2020) suggested that managers working

with advanced enterprise feedback management (EFM) software are still primarily tracking relatively simple customer metrics such as overall satisfaction, complaints, recommend intention, etc. In fact, such information is relatively easy to capture with today's massive internal and external data availability and relatively easy to interpret and analyze, thanks to new developments in AI & ML tools.

Analyzing firms' internal information, Bauman et al. (2012) compared customer survey data with the available information about the same customers. Their data mining model explained almost 60 percent of the variation in loyalty intentions, whereas their survey data additionally explained only 8.4 percent. Baier et al. (2020) applied supervised machine learning to identify dissatisfied customers when they initiate a service request in company incident management systems. They demonstrated that text-based incident descriptions can be used to identify and flag dissatisfied customers for a potential service recovery. Similarly, Sidaoui et al. (2020) demonstrated that chatbot data is suitable for analyzing sentiment to extract customer experience and feelings. AI even has the ability to identify dissatisfied customers that do not share their experiences explicitly during service interactions by recognizing emotions in facial expressions (González-Rodríguez et al., 2020) and sentiment in live speech and recordings (Henkel et al., 2020; Schuller & Schuller, 2021).

Analyzing external information, data outside company boundaries, Kang and Park (2014) suggested that customer reviews contain valuable information for monitoring C-Sat. Research by Fan et al. (2015) found that analyzing social media content offers more value than the more traditional approaches such as customer surveys or focus groups. Similarly, Xiang et al. (2015) found a strong correlation between experiences shared in online reviews and satisfaction ratings given by those customers. Klostermann et al. (2018) analyzed image and textual data from social media, such as Facebook, Instagram, and Twitter, and concluded that aggregating and mapping textual information into image clusters enabled marketers to derive meaningful insights about what consumers think and feel about their brands. Korfiatis et al. (2019) further suggested that online reviews with unstructured information can be of value to increase competitive performance. Liang et al. (2020) evaluated online reviews in takeaway platforms and concluded that such reviews give restaurants untapped opportunities to better understand their

customers and find ways to improve their services.

AI & ML tools are also revolutionizing the way customers interact and engage with brands (Guha et al. 2021; Lim et al., 2022), e.g., by **AI-enabled service encounters** (Ameen, et al., 2020). Indeed, modern service encounters are technology dominant and characterized by complex service systems, including AI assistants (Dawar & Bendle, 2018; Kaplan & Haenlein, 2019), computers and AI as customers (Huang & Rust, 2022) and service robots (Dirican, 2015; van Doorn et al., 2017; Wirtz et al., 2018; Morita et al., 2019; Prentice et al., 2020; Lu et al., 2021). With the increasing number of connected devices such as autonomous vehicles and smart home appliances, even **Machine-to-Machine interactions** (Güngör, 2018) can provide relevant information to predict the likelihood of product or service events and failures, and consequently, predict C-Sat and behavior.

The use of AI & ML tools in alignment with a well-defined digital strategy can indeed generate competitive advantage (Borges et al., 2021). However, AI & ML tools do not automatically bring these advantages since there are many organizational requirements and pitfalls, privacy concerns and growing regulations around using AI & ML responsibly (e.g., GDPR, 2016; European Commission 2019; European Parliament, 2021; OECD, 2020; Zhu et al., 2021; Jöhnk et al., 2021).

Managerial Reflections from a Global Survey

In order to verify the assumptions emerging above, a short survey has been shared with several customer experience management groups on LinkedIn, an online professional networking platform. More than 3000 views resulted in 111 survey participations with 101 completed surveys. Participants with different tenures from various organizations were from Europe (75%), North America (16%) and Asia (9%).

Results showed that around 75% of the firms are using simple C-Sat metrics in combination with other metrics, especially the NPS, but also with CES and frontline input. 27% of the firms were involving less than 1% of their customers with their C-Sat measurements; and 22% of the firms were measuring C-Sat only once a year. Firms using only simple C-Sat metrics were 29% whereas firms only using the NPS were 13%. CES and frontline input were rarely used as a standalone metric and AI & ML tools were used only in less than 5% of the firms that participated in the survey.

One of the interesting outcomes of the survey was about the relationship between participant tenures and how C-Sat measurements as well as AI & ML were perceived. When the tenure is increased from entry-level towards c-level, perceptions about the adequacy of traditional metrics gradually decreased and confidence about the capability of AI & ML gradually increased. Participants across all tenures similarly disagreed that *“their organizations had a sound strategy in customer satisfaction measurements and how AI & ML can improve it.”*

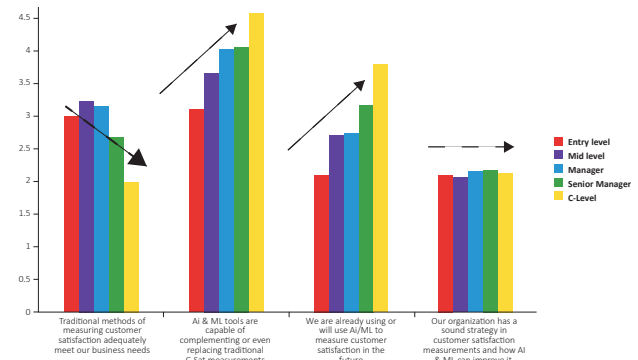


Figure 1: Perceptions about C-Sat and AI & ML across tenures

Managerial Implications

With the help of currently available Ai & ML tools, firms are already improving their learning and decision making capabilities; and able to (1) predict using supervised algorithms (e.g. linear regression) to estimate customer lifetime value (CLV); (2) classify using supervised algorithms (e.g. decision trees) to identify customers likely to churn or buy a new product; (3) cluster using unsupervised algorithms (e.g. k-means) to identify specific segments e.g. highly (dis)satisfied customers; and (4) optimize using deep learning (e.g. neural networks) algorithms to adjust service levels for customers, for instance, by dynamic routing to a virtual chatbot or to a specific customer service representative.

While CRM and ERP providers (e.g. Oracle, SAP) have the potential to utilize the predictive power of their data platforms, enterprise feedback management (EFM) providers (e.g., Medallia, Satmetrix, Qualtrics) have the potential to incorporate multiple data sources to augment customer feedback data and offer insight with, for example, text and sentiment analysis, prescribe actions such as connecting specific service employees or virtual assistants (e.g., Amelia, Watson) to customers based on their predicted service needs and emotional states (e.g., Afiniti, Affectiva) and even coach employees in real time (e.g., Cogito).

Consequently, a broader picture of C-Sat can be compiled around the customer rather than relying on frequent customer feedback requests that have a low and even negatively biased response rates (Güngör, 2009), and which eventually may demotivate service departments and employees as observed by recent research (Gartner, 2021).

CONCLUSIONS

Based on relevant literature review and empirical data, and as confirmed by a global survey, it appears that traditional methods of measuring C-Sat do not adequately meet current business needs. Frontline employee observations that are captured in the customer information systems can partly compensate these shortcomings and can elucidate even subtle customer experience fluctuations. However, there are much more to gain when ML & AI tools and methodologies are applied.

AI & ML tools and methodologies are capable of listening, understanding and diagnosing C-Sat issues, analyzing and generating insights from both internal and external data sources, predicting potential outcomes, and finally recommending personalized actions for customers such as a service recovery activity or a new product recommendation. Consequently, AI & ML tools and algorithms are also capable of complementing or even replacing traditional C-Sat measurement tools and methodologies to the point where they can even predict customer experience before a transaction occurs.

Nevertheless, while AI & ML methodologies have become quite useful, tools alone are insufficient for improving processes and cannot solve complex customer problems. Leveraging these tools for competitive advantage requires a sound strategy in both C-Sat measurements and AI & ML analytics, which seems to be the missing link at the moment.

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The Effect of Fiscal Policy on Inflation Rate in Cambodia

Eng Ratana and Lim Siphath*

ABSTRACT

A reduced-form VAR model was employed to investigate the inter-relationship between three macroeconomic indicators, consumer price index, nominal exchange rate, and government expenditure. The estimated result of the forecast error variance decomposition indicated that the variation of inflation rates over the period of the study was mainly caused by the variation of itself about 96 percent in the short-run and reduced to around 81.31 percent in the long-run. This claimed that the price was sticky in Cambodia. In the short-run, the percentage change of exchange rate caused no more than 5 percent change of the variation of inflation rate, but the effect was predicted to be two and half folds in the long run. The variation of inflation rate caused by the percentage change of government expenditure was no greater than 6 percent considered as low as compared to the percentage change of exchange rate. The estimated result of the impulse response function indicated that fiscal expansionary had a positive and negative effect on inflation rate in the short and long run, respectively..

Keywords: Inflation rate; Fiscal policy; VAR model; FEVD; IRF

INTRODUCTION

The explosion of the pandemic of COVID-19 in 2020 had a huge negative impact on the operation of the production of garment textiles, footwear, travel goods, and bicycles, especially the effect on agricultural and tourism sector that determined as the core sources of economic growth in Cambodia. As a result, a real GDP growth rate was projected to be at a negative of 3.1 percent. Despite the economy has rebounded back in 2021, yet the recovery was considered as slow due to the spread of the disease. At the second and third quarter of the year, the rate of growth of the economy was estimated to be 2.2 percent. Due to relaxation of travel restriction set by the Royal Government of Cambodia in 2022, the economic growth rate was predicted to be 4.5 percent (World Bank, 2021).

Prior to the COVID-19 pandemic, in the last ten years (2010-2019), Cambodia's average real output growth rate was about 7 percent. At the same time, the inflation rate was around 3 percent based on year-on-year percentage change of the consumer price index of all consumption goods (Asian Development Bank, 2021). The rate remained stable at 2.9 percent between 2020 and 2021 and expected to decline to 2.7 percent in 2022. This was regarded as low as compared to the ASEAN nations. (Asian Development

Bank, 2022). The accomplishment of a sustainable economic growth and price stability is not an easy task to be achieved by the government of a nation. Over the period of more than two decades, Cambodia has made a robust economic performance (International Monetary Fund, 2021). The measurement of macroeconomic stability can be assessed through the stability of economic growth, exchange rate, and price level. Macroeconomic policy is generally implemented by the government in order to boost economic activities, improve social welfare, especially keeping inflation rate as low as possible (United Nations, 2012). Price stability can be achieved via the use of monetary policy, or fiscal policy, or the mixed up of both policies. In a highly dollarized economy, the National Bank of Cambodia (NBC) conducts a monetary policy by mainly using "US Dollar Auction," which is considered as a process of buying or selling US Dollar in the domestic foreign exchange market to manage money supply in the economy, while fiscal policy is carried out by the Ministry of Economy and Finance (MEF) aiming to control government budget, tax revenues, government expenditures, and public debt. The study of the effectiveness of monetary policy on price levels was done by Siphath (2010) using a reduced-form Vector Autoregressive (VAR) model of three variables: narrow based money (M1), nominal exchange rate, and consumer price index. This research paper is an expanded version by employing a Structural VAR (SVAR) model over four key macroeconomic variables, real gross domestic

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product, broad money (M2), foreign exchange, and price level. The objective of this research is to evaluate the performance of monetary policy on output and inflation. The mixed of monetary and fiscal policy was implemented by Luyna and Ravin (2011) to investigate how inflation rate and real GDP response to the shock of money supply and government expenditure by adopting VAR model of five indicators including government purchase, monetary aggregate, exchange rate, price level, and gross domestic product. To analyze further, the short and long run relationship between consumer price index, exchange rate, money supply, and government expenditure, especially to measure the speed of adjustment how fast price level adjust back to equilibrium owing to fiscal and monetary policy shock, a Vector Error Correction Model (VECM) was employed by Siphath and Dash (2021). In the absence of monetary policy, the study of the effectiveness of fiscal policy on inflation rate has not yet been conducted in Cambodia. Thus, the main purpose of this research is to seek an answer to the research question, "Does fiscal expansionary cause general price level to increase in Cambodia?"

LITERATURE REVIEW

A good fiscal management associated with the management of government expenditure, tax revenues and public debt, was one of the key successes in controlling general price level in the country (Sims, 1998). The assumption of fiscal theory was applied to learn about the behavior of fiscal and inflation variable, whether it was a Ricardian or Non-Ricardian behavior. The estimated result of a study created a mixed outcome that the US data were more in line with a non-Ricardian behavior over some period of time as indicated by Cochrane (1998) and Woodford (1998). In contrast, it found to be in line with a Ricardian behavior based on research studied by Canzoneri et al. (2002) and it was consistent with research conducted by Afonso (2002) in European Union.

Five macroeconomic variables, government spending, taxes, real output, price level, and 3-months interest rates of five OECD countries, the United States of America, the United Kingdom, West Germany, Canada and Australia, were integrated in a VAR model to investigate the effect of fiscal policy on price level and output using quarterly time series data between 1961: Q1 and 2002: Q2. The result of the

study showed that fiscal expansionary had a positive impact of price level (Perotti, 2002). The model was replicated using US macroeconomic data, private consumption, total government expenditure, total government revenue, private residential investment, private non-residential investment, interest rate, adjusted reserves, producer price index of crude materials, and GDP deflator, over the period between 1955: Q1 and 2000: Q4. During the period of the study, the link between fiscal policy and inflation rate was weak (Mountford & Uhlig, 2002). Research conducted by Fatas and Mihov (2002) figured out the way to close the gap between the empirical research and the theory by integrating a Ricardian equivalence over an overlapping generations model connecting with two main assumption, imperfect competition and sticky prices. The gap was closed and the result of this research was consistent with Perotti.

The measurement of inflation volatility in OECD countries including Austria, Belgium, Canada, Denmark, Finland, France, Germany, Great Britain, Ireland, Italy, Japan, the Netherlands, Spain, Sweden and the United States was done using the panel data from 1967 to 2001. The volatility of inflation rate was defined to be a function of seven macroeconomic variables. The empirical result based on Fixed Effect (FE) and Generalized Least Squares (GLS) using estimated cross-section residual variances as weights method showed that fiscal shock had a significant positive impact on the standard deviation of inflation rate in six OECD nations (Rother, 2004). As indicated by the estimated result of a VAR model in Spain proved that the domestic output could be increased by fiscal expansionary, but at higher cost of inflation (Castro & Cos, 2008). Shaheen and Turner (2010) came up with similar research results for Pakistan's fiscal policy. Nonetheless, these authors point out a shortcoming of the SVAR method, stating that the findings from a SVAR model may lose accuracy over longer time horizons and should be regarded with caution. The SVAR technique was also utilized to examine the effects of fiscal policy in certain middle-income and developing nations. One of the most common methodologies in assessing the effectiveness of fiscal policy was developed by Blanchard and Perotti (2002) by employing SVAR model. This technique was replicated by Gnip (2013) to evaluate the stability of fiscal policy in Croatia by integrating seven macroeconomic variables: output, prices, interest rates, private consumption, private investment, employment and wages in a SVAR model. Quarterly time series data were employed between

1996: Q1 and 2011: Q4. The empirical result of this paper showed that government expenditure had a negative impact of price level in Croatia.

The empirical investigation on the effectiveness of fiscal policy in Nigeria using Autoregressive Distributed Lag (ARDL) model over the period between 1980 and 2017 showed that government spending on capital recurring had a negative significant impact on the change in the general price level. Moreover, inflation rate was being affected by exchange rate change (Dikeogu, 2018). The variation of money supply was explained mainly by the variation of exchange rate and inflation rate regarding the empirical result generated from a VECM using quarterly data over the period between 1991 and 2018 of four economic indicators: government expenditures, exchange rate, inflation rate, and broad money (Yasin et al., 2020). The assessment of the mix between monetary and fiscal policy was conducted in Bangladesh. The analysis based on VECM model of five key economic variables: gross domestic product, government purchase, monetary aggregate, interest rate, and price level during the period between 1980 and 2018. As indicated by the estimated result of long-run equation, price stability can be accomplished through a tighten control on government spending and money supply (Ahmmmed, 2020).

METHODOLOGY

One of the most famous systems of equation models created by Sims (1980) known as Vector Autoregressive (VAR) model is generally employed in order to study the interrelationship between macroeconomic variables. This research is trying to seek answer to a research question, "Does fiscal expansionary cause general price level to increase in Cambodia?" To fulfill the main objective of the study, three time series variables including consumer price index (CPI), nominal exchange rate (EXC), and government expenditure (GEXP), are integrated together in the VAR model. The model specification is presented in equation (1) below:

$$\begin{aligned} \ln CPI_t &= \beta_{10} + \sum_{i=1}^p \beta_{11i} \ln CPI_{t-i} + \sum_{i=1}^p \beta_{12i} \ln EXC_{t-i} + \sum_{i=1}^p \beta_{13i} \ln GEXP_{t-i} + \varepsilon_{1t} \\ \ln EXC_t &= \beta_{20} + \sum_{i=1}^p \beta_{21i} \ln CPI_{t-i} + \sum_{i=1}^p \beta_{22i} \ln EXC_{t-i} + \sum_{i=1}^p \beta_{23i} \ln GEXP_{t-i} + \varepsilon_{2t} \\ \ln GEXP_t &= \beta_{30} + \sum_{i=1}^p \beta_{31i} \ln CPI_{t-i} + \sum_{i=1}^p \beta_{32i} \ln EXC_{t-i} + \sum_{i=1}^p \beta_{33i} \ln GEXP_{t-i} + \varepsilon_{3t} \end{aligned} \quad (1)$$

Where θ_{ij} are parameter to be estimated and ε_{it} is a vector of error terms which assumed to be i.i.d. All variables in the system are equipped by natural logarithm to make it become continuous. The first difference of each data series is interpreted as growth rate. Before analyzing the model, the unit root test is performed using Augmented Dickey-Fuller (ADF) (Dickey & Fuller, 1979) test to all data series in the system to check whether it is stationary on non-stationary. If the result of the test shows that the series is non-stationary or has unit root, it will be transformed to be first difference and the test is re-performed again. After solving problem of unit root, the next step is the determination of the optimal lags length of the model using Information Criteria (IC). The lower the IC, the better the model.

The ADF test can be performed by running the following regression:

$$\Delta Y_t = \omega_1 + \omega_2 t + \delta Y_{t-1} + \vartheta_i \sum_{i=1}^m \Delta Y_{t-i} + \varepsilon_t \quad (2)$$

where Y_t indicates both dependent and independent variables, t represents time trend, ε_t is a pure white noise error term, ΔY_t is the first different, and $\omega_1, \omega_2, \delta, \vartheta_i$ are coefficients. If $\delta=0$, the tested variable has a unit root which is non-stationary (Enders, 2004). Then, to avoid the autocorrelation of the error term, ε_t in equation (2); Maximum Likelihood method should be applied to estimate the model. The log-likelihood function can be expressed as follow:

$$\begin{aligned} \log(L) &= -\frac{(n-p)m}{2} \log(2\pi) - \frac{n-p}{2} \log(\det(\Omega)) \\ &\quad - \frac{1}{2} \sum_{t=p+1}^n \left(Y_t - \alpha - \sum_{j=1}^p \Phi_j Y_{t-j} \right) \Omega^{-1} \left(Y_t - \alpha - \sum_{j=1}^p \Phi_j Y_{t-j} \right) \end{aligned} \quad (3)$$

where Ω is the covariance matrix which can be estimated by $\hat{\Omega} = \frac{1}{n-p} \sum_{t=p+1}^n \varepsilon_t \varepsilon_t'$, n is number of observations, p is the number of lags, m is number of variables, $\det$ is determinant. The optimal lags of the model is determined by using Akaike Information Criteria (AIC) (Heij et al., 2004).

$$AIC(p) = \log(\det(\hat{\Omega}_p)) + 2 \frac{pm^2}{n} \quad (4)$$

At the same time, before making any future prediction, the stability test is employed.

Consider a simple VAR model with two variables y and z :

$$y_t = a_{11}y_{t-1} + a_{12}z_{t-1} + \varepsilon_{yt} \quad (5)$$

$$z_t = a_{21}y_{t-1} + a_{22}z_{t-1} + \varepsilon_{zt} \quad (6)$$

where ε_{yt} and ε_{zt} are white-noise disturbance that may be correlated with each other and, for simplicity, intercept terms have been ignored. Using lag operators (L), we can write (5) and (6) as

$$(1 - a_{11}L)y_t - a_{12}Lz_t = \varepsilon_{yt} \quad (7)$$

$$-a_{21}Ly_t + (1 - a_{22}L)z_t = \varepsilon_{zt} \quad (8)$$

The next step is to solve for y_t and z_t . Writing the system in matrix form we obtain

$$\begin{bmatrix} (1 - a_{11}L) & -a_{12}L \\ -a_{21}L & (1 - a_{22}L) \end{bmatrix} \begin{bmatrix} y_t \\ z_t \end{bmatrix} = \begin{bmatrix} \varepsilon_{yt} \\ \varepsilon_{zt} \end{bmatrix} \quad (9)$$

Using Cramer's Rule or matrix inversion, we can obtain the solutions for y_t and z_t as

$$y_t = \frac{(1 - a_{22}L)\varepsilon_{yt} + a_{12}L\varepsilon_{zt}}{(1 - a_{11}L)(1 - a_{22}L) - a_{12}a_{21}L^2} \quad (10)$$

$$z_t = \frac{a_{21}L\varepsilon_{yt} + (1 - a_{11}L)\varepsilon_{zt}}{(1 - a_{11}L)(1 - a_{22}L) - a_{12}a_{21}L^2} \quad (11)$$

Note that both variables have the same inverse characteristic equation:

$$(1 - a_{11}L)(1 - a_{22}L) - a_{12}a_{21}L^2. \text{ Setting } (1 - a_{11}L)(1 - a_{22}L) - a_{12}a_{21}L^2 = 0$$

and solving for L yields the two roots of the inverse characteristic equation. In order to

$$\lambda^2 - (a_{11} + a_{22})\lambda + (a_{11}a_{22} + a_{12}a_{21}) = 0 \quad (12)$$

work with the characteristic roots (as opposed to the inverse characteristic roots), define $\lambda = 1/L$.

Since the two variables have the same characteristic equation, the characteristic roots of (12) determine the time part of both variables. If both characteristic roots (λ_1, λ_2) lie inside the unit circle, (10) and (11) yield stable solution for y_t and z_t , the system is stable (Enders, 2014).

After that, impulse response function which represents the impact of one variable to another variable is derived. Just as an autoregressive has a moving average representation, a vector autoregression can be written as a vector moving average (VMA). In fact, equation (5) and (6) are the VMA that the variable (i.e., y_t and z_t) are expressed in terms of the current and past values of the two types

of shock (i.e., e_{1t} and e_{2t}). The VMA representation is an essential feature of Sim's (1980) methodology in that it allows you to trace out the time path of the various shocks on the variable contained in the VAR system. For illustrative purposes, continue to use the two-variable VAR in matrix form,

$$\begin{bmatrix} y_t \\ z_t \end{bmatrix} = \begin{bmatrix} a_{10} \\ a_{20} \end{bmatrix} + \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix} \begin{bmatrix} y_{t-1} \\ z_{t-1} \end{bmatrix} + \begin{bmatrix} e_{1t} \\ e_{2t} \end{bmatrix} \quad (13)$$

equation (13) can be written as

$$\begin{bmatrix} y_t \\ z_t \end{bmatrix} = \begin{bmatrix} \bar{y} \\ \bar{z} \end{bmatrix} + \sum_{i=0}^{\infty} \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix}^i \begin{bmatrix} e_{1t-i} \\ e_{2t-i} \end{bmatrix} \quad (14)$$

where $\bar{y} = [a_{10}(1 - a_{22}) + a_{12}a_{20}] / [(1 - a_{11})(1 - a_{22}) - a_{12}a_{21}]$ and

$$\bar{z} = [a_{20}(1 - a_{11}) + a_{21}a_{10}] / [(1 - a_{11})(1 - a_{22}) - a_{12}a_{21}]$$

Equation (14) expresses y_t and z_t in terms of the $\{e_{1t}\}$ and $\{e_{2t}\}$ sequences. However, it is insightful to rewrite (14) in terms of the $\{\varepsilon_{yt}\}$ and $\{\varepsilon_{zt}\}$ sequences. However, the vector of errors can be written as

$$\begin{bmatrix} e_{1t} \\ e_{2t} \end{bmatrix} = \frac{1}{1 - b_{12}b_{21}} \begin{bmatrix} 1 & -b_{12} \\ -b_{21} & 1 \end{bmatrix} \begin{bmatrix} \varepsilon_{yt} \\ \varepsilon_{zt} \end{bmatrix} \quad (15)$$

Equation (13) and (14) can be combined to form

$$\begin{bmatrix} y_t \\ z_t \end{bmatrix} = \begin{bmatrix} \bar{y} \\ \bar{z} \end{bmatrix} + \frac{1}{1 - b_{12}b_{21}} \sum_{i=0}^{\infty} \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix}^i \begin{bmatrix} 1 & -b_{12} \\ -b_{21} & 1 \end{bmatrix} \begin{bmatrix} \varepsilon_{yt-i} \\ \varepsilon_{zt-i} \end{bmatrix} \quad (16)$$

Since the notation is getting unwieldy, we can simplify by defining the 2.2 matrix ϕ_i with elements $\phi_{jk}(i)$

$$\phi_i = \frac{A_i}{1 - b_{12}b_{21}} \begin{bmatrix} 1 & -b_{12} \\ -b_{21} & 1 \end{bmatrix} \quad (17)$$

Hence, the moving average representation of (14) and (15) can be written in term of the $\{\varepsilon_{yt}\}$ and $\{\varepsilon_{zt}\}$ sequences:

$$\begin{bmatrix} y_t \\ z_t \end{bmatrix} = \begin{bmatrix} \bar{y} \\ \bar{z} \end{bmatrix} + \sum_{i=0}^{\infty} \begin{bmatrix} \phi_{11}(i) & \phi_{12}(i) \\ \phi_{21}(i) & \phi_{22}(i) \end{bmatrix} \begin{bmatrix} \varepsilon_{yt-i} \\ \varepsilon_{zt-i} \end{bmatrix} \quad (18)$$

or, more compactly,

$$x_t = \mu + \sum_{i=0}^{\infty} \phi_i \varepsilon_{t-i} \quad (19)$$

$$\text{where } \mu = \begin{bmatrix} \bar{y} \\ \bar{z} \end{bmatrix}.$$

The moving average representation is an especially useful tool to examine the interaction between the $\{y_t\}$ and $\{z_t\}$ sequences. The coefficients of ϕ_i can be used to generate the effects of $\{\varepsilon_{yt}\}$ and $\{\varepsilon_{zt}\}$ shocks on the entire time paths of the $\{y_t\}$ and $\{z_t\}$ sequences.

The notation clears that the four elements $\phi_{jk}(0)$ are impact multipliers. For example, the coefficient $\phi_{12}(0)$ is the instantaneous impact of a one-unit change ϵ_{zt} and y_t . In the same way, the elements $\phi_{11}(0)$ and $\phi_{12}(0)$ are the one-period responses of unit changes in ϵ_{yt-1} and ϵ_{zt-1} on y_t , respectively. Updating by one period indicates that $\phi_{11}(0)$ and $\phi_{12}(0)$ also represent effects of unit changes in ϵ_{yt} and ϵ_{zt} on y_{t+1} .

The accumulated effects of unit impulses in ϵ_{yt} and/or ϵ_{zt} can be obtained by the appropriate summation of the coefficients of the impulse response functions. For example, after n periods, the effect of ϵ_{zt} on the value of y_{t+n} is $\phi_{12}(n)$. Thus, after n periods, the cumulated sum of the effects of ϵ_{zt} on the $\{y_t\}$ sequence is

$$\sum_{i=0}^n \phi_{12}(i)$$

Letting n approach infinity yields the long-run multiplier. Since the $\{y_t\}$ and $\{z_t\}$ sequences are assumed to be stationary, it must be the case that for all j and k ,

$$\sum_{i=0}^{\infty} \phi_{jk}^2(i) \text{ is finite}$$

The four sets of coefficients $\phi_{11}(i)$, $\phi_{12}(i)$, $\phi_{21}(i)$ and $\phi_{22}(i)$ are called the impulse response functions. Plotting the impulse response functions [i.e., plotting the coefficients of $\phi_{jk}(i)$ against i] is a practical way to visually represent the behavior of the $\{y_t\}$ and $\{z_t\}$ series in response to the various shocks (Enders, 2014).

Given the estimated result of the VAR model, the Impulse Response Function (IRF) and Forecast Error Variance Decomposition (FEVD) are created to analysis the interrelationship of all variables in the system. The period of the study is between March 2007 and December 2021. All data are collected from the International Financial Statistics (IFS) of the International Monetary Fund (IMF).

EMPIRICAL RESULT

The first part of this section represents descriptive statistics. The Augmented Dickey-Fuller (ADF) Unit Root test of all data series is shown in the second part. The predicted results generated from VAR model, Forecast Error Variance Decomposition (FEVD) and Impulse Response Function (IRF), are conducted in the third part of this section.

Table 1: Descriptive Statistics

	DLNCPI	DLNEXC	DLNGEXP
Mean	0.362361	0.007466	1.897713
Median	0.283494	0.001457	5.021147
Maximum	7.949397	1.856259	167.5309
Minimum	-4.009501	-3.077166	-244.1769
Std. Dev.	1.018660	0.545710	70.90159
Skewness	2.199665	-0.746808	-1.005058
Kurtosis	22.99151	8.396623	5.479566
Jarque-Bera	3107.691	232.5454	75.56704
Probability	0.000000	0.000000	0.000000
Sum	64.50019	1.328922	337.7930
Sum Sq. Dev.	183.6672	52.71047	889785.4
Observations	178	178	178

Over the period of the study, between March 2007 and December 2021, totally, there were 178 observations, monthly average, minimum, maximum, and standard deviation of inflation rate are 0.36 percent, -4.01 percent, 7.95 percent, and 1.02 percent respectively. The average growth rate of exchange rate is 0.007 percent per month with 0.54 percent monthly volatility. The minimum rate change is -3.08 percent, while the maximum growth rate is 1.86 percent. The monthly average growth rate of government expenditure is 1.90 percent. The standard deviation is 70.90 percent. The minimum and maximum monthly growth rate of government expenditure are -244.18 percent and 167.53 percent respectively. Regarding the result of the Jarque-Bera test, the null hypothesis that each data series is normally distributed is highly rejected since the probability of the calculated Jarque-Bera is less than 1 percent.

Table 2: ADF Unit Root Test

Null Hypothesis: The variable has a unit root

		At Level		
		LNCPI	LNEXC	LNEXP
With Constant	t-Statistic	-3.1470	-2.9045	-1.1155
	Prob.	0.0251	0.0470	0.7092
		**	**	n0
With Constant & Trend	t-Statistic	-8.7572	-3.0133	-2.2342
	Prob.	0.0000	0.1318	0.4672
		***	n0	n0
Without Constant & Trend	t-Statistic	2.8589	0.2155	4.8148

	Prob.	0.9990	0.7477	1.0000
		n0	n0	n0
At First Difference				
		d(LNCPI)	d(LNEXC)	d(LNGEXP)
With Constant	t-Statistic	-5.9629	-9.0576	-14.2745
	Prob.	0.0000	0.0000	0.0000
		***	***	***
With Constant & Trend	t-Statistic	-6.2853	-9.0392	-14.2815
	Prob.	0.0000	0.0000	0.0000
		***	***	***
Without Constant & Trend	t-Statistic	-6.5326	-9.0812	-5.2244
	Prob.	0.0000	0.0000	0.0000
		***	***	***

Notes:

a: (*) Significant at the 10%; (**) Significant at the 5%; (***) Significant at the 1% and (no) Not Significant

b: Lag Length based on SIC

c: Probability based on MacKinnon (1996) one-sided p-values

There are three ADF test models, model with constant, model with constant and trend, and model without constant and trend. At level, for LNCPI, the null hypothesis that the series variable has a unit root is rejected regarding the result of ADF test model with constant and model with constant and trend at 5 percent and 1 percent level of significance respectively. In contrast, the null hypothesis stated that LNCPI is non-stationary is failed to be rejected at 5 percent as indicated by ADF model without constant and trend. LNEXC is stationary based on ADF model with constant at 5 percent level, but LNEXC has a unit root based on the model with constant and trend and without constant and trend. LNGEXP is non-stationary because the null hypothesis of all ADF test of the three models are rejected at 5 percent level. However, at first difference, DLNCP, DLNEXC, and DLNGEXP, are all stationary at highly significant of 1 percent level as indicated by the three models of ADF test in Table 2. In order to avoid spurious regression result, the three endogenous variables are transformed to be first difference before running VAR model. The optimal lag lengths of the model is relied on the estimated result of Akaike Information Criterion (AIC). The lower the AIC, the better the model is.

Table 3: VAR Lag Order Selection Criteria

Endogenous variables: DLNCP DLNEXC DLNGEXP

Exogenous variables: C

Sample: 2007M03 2021M12

Included observations: 174

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1374.702	NA	1513.256	15.83565	15.89012	15.85774
1	-1288.770	167.9124	625.0122	14.95138	15.16924	15.03976
2	-1249.195	75.96547	439.8538	14.59994	14.98121*	14.75461
3	-1231.519	33.32121	398.2033	14.50021	15.04488	14.72116
4	-1214.403	31.67363*	362.9035*	14.40693*	15.11500	14.69417*

* Indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

The estimated result of the VAR lag order selection criteria in Table 3 revealed that the lowest value of AIC is at lag four, thus, the optimal lag length of the VAR model is four. Using Ordinary Least Square (OLS) estimation method, the estimated parameters of the VAR model is presented in Table 4. The main objective of the predicted sample parameters of the model is not for interpretation purpose since all of the endogenous variables in the system explained each other due to its own lags, but the results are employed in order to generate future forecast as such forecast error variance decomposition and impulse response function. The reliability of the model in making future prediction is depend on the level of stability of the model, therefore, the stability test is performed.

Table 4: Vector Autoregression Estimates

Sample (adjusted): 2007M07 2021M12

Included observations: 174 after adjustments

Standard errors in () & t-statistics in []

	DLNCP	DLNEXC	DLNGEXP
DLNCP(-1)	0.463227	0.019424	-3.850197
	(0.07681)	(0.04949)	(4.31910)
	[6.03045]	[0.39252]	[-0.89143]
DLNCP(-2)	0.178755	-0.008092	4.293186
	(0.08283)	(0.05336)	(4.65707)
	[2.15821]	[-0.15165]	[0.92186]
DLNCP(-3)	-0.027765	-0.035074	8.904423
	(0.08170)	(0.05264)	(4.59403)
	[-0.33983]	[-0.66634]	[1.93826]
DLNCP(-4)	-0.111038	0.081601	2.143486
	(0.07456)	(0.04803)	(4.19216)
	[-1.48930]	[1.69890]	[0.51131]
DLNEXC(-1)	-0.312995	0.361927	-5.147574
	(0.12377)	(0.07973)	(6.95910)

	[-2.52891]	[4.53921]	[-0.73969]
DLNEXC(-2)	0.020866	-0.192733	24.39289
	(0.13328)	(0.08586)	(7.49377)
	[0.15657]	[-2.24475]	[3.25509]
DLNEXC(-3)	-0.159283	0.058208	2.681160
	(0.13631)	(0.08781)	(7.66417)
	[-1.16857]	[0.66287]	[0.34983]
DLNEXC(-4)	-0.357508	-0.050485	-7.119083
	(0.12714)	(0.08191)	(7.14891)
	[-2.81187]	[-0.61636]	[-0.99583]
DLNGEXP(-1)	0.002742	0.001808	-1.113008
	(0.00137)	(0.00088)	(0.07678)
	[2.00768]	[2.05505]	[-14.4961]
DLNGEXP(-2)	0.006512	0.001576	-0.877084
	(0.00195)	(0.00125)	(0.10947)
	[3.34493]	[1.25670]	[-8.01193]
DLNGEXP(-3)	0.005569	-3.64E-05	-0.566652
	(0.00191)	(0.00123)	(0.10739)
	[2.91579]	[-0.02959]	[-5.27676]
DLNGEXP(-4)	0.002287	-0.001331	-0.275203
	(0.00132)	(0.00085)	(0.07397)
	[1.73870]	[-1.57053]	[-3.72068]
C	0.144092	-0.018969	0.885044
	(0.06581)	(0.04239)	(3.70016)
	[2.18962]	[-0.44744]	[0.23919]
R-squared	0.423914	0.214407	0.639526
Adj. R-squared	0.380976	0.155853	0.612659
Sum sq. resid	99.39780	41.25258	314250.3
S.E. equation	0.785734	0.506189	44.17992
F-statistic	9.872668	3.661725	23.80289
Log likelihood	-198.1818	-121.6726	-899.2987
Akaike AIC	2.427377	1.547961	10.48619
Schwarz SC	2.663398	1.783982	10.72221
Mean dependent	0.338240	0.004670	1.525810
S.D. dependent	0.998669	0.550939	70.98688
Determinant resid covariance (dof adj.)		292.3574	
Determinant resid covariance		231.6029	
Log likelihood		-1214.403	
Akaike information criterion		14.40693	
Schwarz criterion		15.11500	

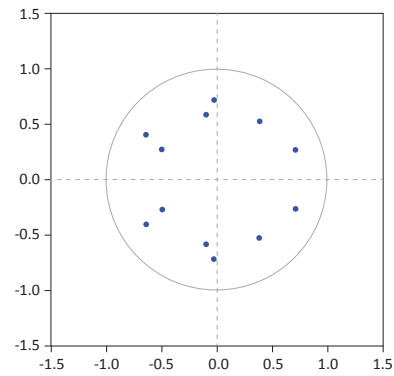


Figure 2: Inverse Roots of AR Characteristic Polynomial

All of the inverse roots of AR characteristic polynomial lie inside the unit circle which can be concluded that the VAR model is stable and the future prediction of all variables in the system are made. The forecast of the variation of one variable which caused by the variation of other variables in the model is conducted using FEVD.

In the first month of the FEVD result, the variation of inflation rate in Cambodia is 100 percent caused by the variation of itself. In the second month, about 2.47 percent and 1.85 percent of the variation of the percentage change of exchange rate and growth rate of government expenditure, respectively, explained the movement of consumer price index. In the third and fourth period, the variation of inflation rate is explained more by the variation of government expenditure than it is caused by the variation of exchange rate change, 5.27 percent of DLNGEXP versus 3.20 percent of DLNEXC in the third month, and 5.56 percent of DLNGEXP versus 4.47 percent of DLNEXC in the fourth month. Between the fifth and twelfth period, the variation of inflation rate caused by the percentage change of exchange rate and the growth rate of government expenditure of no more than 14 percent and 6 percent, respectively. As indicated by this result, it can be summarized that the price is sticky in Cambodia.

Table 5: Forecast Error Variance Decomposition

Variance Decomposition of DLNCPI:				
Period	S.E.	DLNCPI	DLNEXC	DLNGEXP
1	0.785734	100.0000	0.000000	0.000000
2	0.878034	95.67137	2.477724	1.850907
3	0.946872	91.53075	3.203969	5.265284
4	0.969715	89.97049	4.473138	5.556374
5	0.996343	85.34310	9.392652	5.264243
6	1.011030	82.88659	11.94366	5.169751
7	1.018024	81.78219	13.09807	5.119742

8	1.021421	81.33279	13.56015	5.107057
9	1.022567	81.34566	13.55867	5.095672
10	1.023470	81.33414	13.55407	5.111786
11	1.024059	81.31795	13.57214	5.109904
12	1.024476	81.30962	13.58425	5.106125
Cholesky Ordering: DLNCPI DLNEXC DLNGEXP				

In order to have an in-depth study, the response of inflation rate shock to the percentage change of exchange rate and the growth rate of government expenditure, the impulse response function (IRF) is developed from the estimated of the VAR model presented in Table 4 above. The predicted result of the IRF is shown in Figure I below. From the first period to the mid of the third three period in the future, the increase of the growth rate of government expenditure has a positive shock on inflation rate. In contrast, between the mid of the third period and the mid of the fifth period, the response of inflation rate to government expenditure shock become negative and die out and it exhibit a cyclical pattern from the mid of the fifth period onward. At the same period of time, the response of the percentage changes of consumer price index to the percentage changes of exchange rate are negative from the beginning of the first period to the ending of the ninth period and die out, thereafter, the shocks become slightly positive between the tenth and twelfth period. As revealed by these shocks over the period of the study, it could be described that exchange rate depreciation would cause inflation rate to rise.

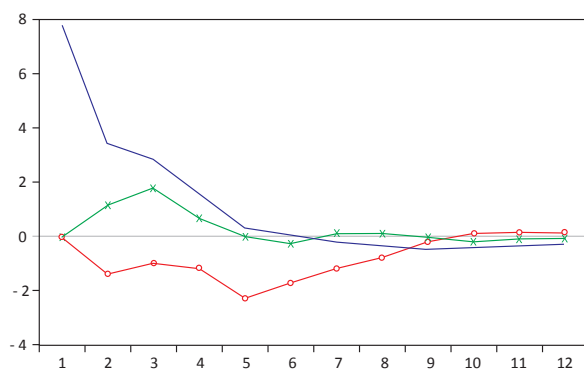


Figure 2: Response of DLNCPI to Cholesky One S.D. Innovations

CONCLUSION

The inter-relationship of three macroeconomic variables, consumer price index, nominal exchange rate, and government expenditure, have been put into analysis in a system of equation known as VAR model. The total number of time period is 178 data point between March 2007 and December 2021. All data series in the system are stationary at first

difference since each null hypothesis of ADF test stated that a series has a unit root is highly rejected at 1 percent significance level. The optimal lag length of the model is determined based on the Akaike Information Criterion and the lowest value of the criterion is generate at four lags.

The variation of inflation rates in Cambodia over the period of this research are mainly caused by the variation of itself about 96 percent in the short-run and reduced to around 81.31 percent in the long-run which is the characteristic of sticky price or it can be concluded that the price is sticky in Cambodia. In the short period, the percentage change of exchange rate caused no more than 5 percent of the variation of inflation rate, but in the long-term the effect has reached 13.58 percent. From the short to the long term, the variation of inflation rate caused by the percentage change of government expenditure has no greater than 6 percent considered as low as compare to the percentage change of exchange rate.

The response of inflation rate to the percentage change of government expenditure shock is positive in the short-run, but become negative in the long run. The effect die out in the fifth period and exhibit slightly movement around zero or mean until the last period. In contrast, from the short term to the long-term period, the response of the percentage change of consumer price index to the percentage change of exchange rate is negative. In conclusion, the government has to be careful in executing the budget, especially in the short-run since it has a negative impact on price level in the country, despite the variation of inflation rate is caused less by the variation of government expenditure, but the response of the shock is positive. Since Cambodia is classified as a highly dollarized economy, under the context of macroeconomic policies, price stability might have been accomplished through the stabilization of exchange rate that aim to be under the control of the central bank using monetary policy. One of the best strategies considered as the most effective strategy in controlling exchange rate movement is "US Dollar Auction" which is a process of buying or selling US Dollar in domestic foreign exchange market by the central bank using international reserve. US Dollar will be sold to money exchanger in the way of auction conducted at the central bank, if the policymakers of the monetary policy committee observed that the Riel is deprecate against US Dollar in domestic foreign exchange market, while the buying process is taken place, if the Riel considered to be appreciated a lot and breach the threshold.

This research uses the reduced-form VAR model, which revealed just only the impact of one variable to other variables in the system through the lags of itself, and the lags of other variables, but it does not take into account the contemporaneous impact of the variables in the model which might occur at the same period of time. Therefore, in order to expand this research in more detail in the future, a Structural VAR (SVAR) model should be applied.

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The Role of Audit Committee in Enhancing External Audit during COVID-19 Pandemic to Meet Stakeholders' Needs

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ABSTRACT

In addition to being a significant business interrupter for many entities, the impact of the COVID-19 pandemic has created significant financial reporting implications for many companies around the globe. This paper is conceptual in nature and seeks to gain a better understanding of the effectiveness of audit committee in enhancing external audit quality to meeting stakeholders need, especially during the period of COVID-19 pandemic and provides key areas for audit committees oversight duties during challenging time caused by the pandemic. The last decade has been rich in academic insights on how audit committee can enhance the effectiveness of external audit in meeting stakeholders needs. Our paper offers a review of the related literature on this topic and discusses the main attributes that would be needed in enhancing the role of audit committee during challenging times caused by external factors such as the COVID-19 pandemic. This review is organized around three major issues, identified in relation to COVID-19 effects on corporate reporting, audit committees and stakeholders needs in the time of pandemic and the role of audit committees in enhancing external audit at the time of COVID-19 pandemic. This paper has implication for company's audit committee, board of directors, accounting firms and academician on how audit committee roles can enhance external audit during COVID-19 pandemic to meet stakeholders' needs.

Keywords: Audit committee; COVID-19; External audit; Stakeholders need

INTRODUCTION

Financial scandals in developed countries such as the USA and the UK have highlighted the need for greater transparency and credibility in order to protect shareholders and stakeholders needs. There is a general agreement among academicians and practitioners that the quality of corporate reporting depends on a sound firm-level governance mechanisms as well as the quality of external audit and the legal framework in the country in which the firm operate. It has been argued that the audit committee (AC) is a key mechanism for achieving this transparency and protecting shareholders' and other stakeholders' interests. The AC as one of the firm-level governance mechanism is seen as a pivotal attribute in enhancing and improving the quality of the reporting process that includes internal audit quality, external audit quality and financial information quality (Piot & Kermiche, 2009; Bédard & Gendron, 2010; Carcello et al., 2011). Moreover, the AC is a key governance mechanism in the process of

monitoring the quality corporate reporting, and has the responsibility of addressing any issues concerning the preparation and the overseeing of the financial statement (Boubaker & Nguyen, 2017; Carcello et al., 2011; Ma'aji et al., 2021). It also influences the efforts and independence of the external auditor, especially in case of disagreements with management. However, the rapid changes in the business environment due to advancement in information technology, the complex nature and dynamic of 21st century businesses and together with some major scandals in the corporate sector has resulted in the AC role to evolve and expand in an attempt to enhance the quality of corporate reporting and governance and restore public confidence.

Furthermore, the novel coronavirus (COVID-19) pandemic has caused a crisis for the global economy and markets. As a consequence of the COVID-19 no business, industry, or economy has been spared from the devastating effects of the pandemic as it shut down many countries' economies for a number of months in order to control the spread of the infectious disease. This has disrupted different macroeconomic or industry factors in the economy such as supply

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chains across international boundaries, demand for goods and services domestically and overseas, and in the labour force supply. This has resulted in regulators and accounting standards setters such as the IASB to revised and amended some accounting standard to better adjust and suit the new reality as a result of the COVID-19 pandemic. In this regard, the AC has a critical role to play for companies in a business environment that have been severely disrupted by the COVID-19 pandemic. The COVID-19 pandemic has affected the recognition and measurement of values of assets (including intangibles, property, inventories, receivables/loans, investments, other financial assets, contract assets and deferred tax assets) and liabilities (including provisions for onerous contracts, financial guarantees and restructuring) (Levy, 2020). Moreover, in the wake of the COVID-19, investors are increasingly asking for more forward-looking information and disclosures.

Moreover, the effect of the pandemic would lead to a number of disclosures on sources of estimation uncertainty and key assumptions and sensitivity analysis and the underlying drivers of results, business strategies, risks and future prospects (Deloitte, 2020; Delicata & Fenech, 2020). These remeasurements and disclosures would definitely affect the bottom-line profit and other comprehensive income (OCI). Primarily, the fiduciary responsibilities of AC are to contributes to ensuring a high-quality oversight of the internal control system, ensuring the independence of the external auditor and the risk management process. However, in the wake of COVID-19 and its adverse effect on businesses, in addition to the AC fiduciary responsibilities for overseeing the external auditor and financial statements, they can contribute valuable oversight duties in areas such as cybersecurity, changes in operations and organizational culture and restricting opportunities or incentive for management to manipulate earnings, which in turn improves earnings quality (Deloitte, 2020; Delicata & Fenech, 2020; IFAC, 2020). This is because stakeholders need to understand that the board of directors and the audit committees will be making reasonable judgements in the context and on the basis of information available currently.

There is a vast amount of corporate governance literature that has been dedicated to the question of the determinants of audit committee effectiveness. This paper is conceptual in nature and seeks to gain a better understanding of the effectiveness of audit committee in enhancing external audit quality to

meeting stakeholders need, especially during period of COVID-19 pandemic and provides key areas for audit committees oversight duties during challenging time caused by external factors through a synthesis literature review. To this end, we organize our review by highlighting two levels of analysis. The first level of analysis covers discussions on how COVID-19 has impacted on the quality of the corporate reporting process that includes external audit quality and financial information quality. The second level of analysis brings together the contributions relating to the dynamics surrounding audit committees, in terms of the enhancing the quality of financial reporting process and external audit process in meeting stakeholders needs.

COVID-19 AND CORPORATE REPORTING ISSUES

Given the continuation of economic downturn, financial market volatility, liquidity concerns, deteriorating credit, increases in government sizeable fiscal and monetary stimulus package as a result of COVID-19 pandemic, it probable that businesses may face many accountings and financial reporting challenges. The pandemic also coincided with the deadline for calendar-year entities to prepare and file their annual reports. Furthermore, accounting standards and regulators are already requiring companies to factor COVID-19 related risks into operations, financial condition, and cash flows during this crisis (Deloitte, 2020; Delicata & Fenech, 2020). For example, business that might be profitable in pre-COVID-19 era would be looking at possibilities of charges for once unthought-of circumstances, from fixed asset impairment to inventory and receivables write-downs. Additionally, many companies will also need to account for debt and other contractual modifications, including restructuring, and debt-covenant modifications. Applying this often-complex accounting guidance in these areas may be challenging and will require management to exercise significant judgment. In this regard, the AC should provide necessary oversight to the external auditors to provide assurance and confidence that the assumptions and judgment used by the management reasonable and realistic and are up to date on all the happenings.

Additionally, the primary users of financial statement such as investors and other stakeholders would be very much interest in not just the historical financial performance that is usually reported but to also understand company's future prospects. These users will require those in charge of preparing the

financial statement takes additional efforts to ensure that the financial statements meet the users' and the auditors' expectations relating to the impact of COVID-19 on the business (Chalmers & Picard, 2021; Pascal, 2020). However, based on accounting standards, disclosure requirements largely depend on materiality and whether failure to disclose this risk factor would make the financial statements misleading to investors. Additionally, disclosing and recognizing COVID-19 financial effects on companies may require management to exercise significant judgment (Pascal, 2020). The assumptions should be realistic and should not be overly optimistic or pessimistic. Therefore, this will require that good governance and effective oversight arrangements are in place during the COVID-19 crisis, as companies are faced with significant uncertainty, a rapidly changing risk landscape, and an increased need for transparency by the users of financial reports and confidence in reported information and its implications (Delicata & Fenech, 2020). Similarly, the AC needs to be engaged and informed and receive actionable and timely information from management so they can effectively carry out their oversight role.

AUDIT COMMITTEES AND STAKEHOLDERS' NEEDS

The collapse of international giants like Enron, WorldCom, Adelphia Communications, Parmalat, Refco, Northern Rock, Lehman Brothers and Rayco Construction Co. among others and more recently Wirecard, have been an eye-opener for various corporate stakeholders to make realised the emergent need to comply with the principles of good corporate governance. These also called into question by stakeholders of the quality of financial reporting and the effectiveness of the audit process (Cullinan, 2004; Causholli et al., 2015; Khasharmeh & Desoky, 2018). Since the public endorsement of audit committee (AC) in 1940 in the aftermath of the McKesson & Robbins (1939) scandals in the US, the AC has undergone a series of amendments in their roles and responsibilities by many regulators in ensuring that there are good corporate governance mechanisms in place, independence of the audit process and harmonisation in the use of AC internationally. For example, according to Smith Report revised in 2016 by the Financial Reporting Council (FRC), an AC should be established with at least three members, whom should be independent non-executive directors and the committee should have at least one member who is having a recent and relevant financial experience (FRC, 2016). The ACs should be independent of

executive director so as to help to ensure quality audit and contributes to financial statement users' reliance on the financial reporting process. AC plays an important role in enhancing the role of audit process in meeting stakeholder's needs (FRC, 2016).

Similarly in the US, the Sarbanes-Oxley Act (SOX) of 2002 clearly states that all committee members must be independent to preserve the integrity of the auditing process. By virtue of ensuring that all ACs are independent, shareholders gain assurance that the company is doing its best to prevent inside employees from manipulating the work of the committee and the external auditors. AC are responsible to choose and oversee the issuer's independent accountant. The board must have procedures in place to manage complaints about the issuer's accounting practices. The audit committee's charter gives the committee the authority to enlist the help of independent advisors and to budget accordingly for them. AC also have the authority for the budget for funding the independent auditor (SOX, 2002).

The audit committee plays an important role in assisting the board to fulfil its oversight responsibilities in areas such as an entity's financial reporting, internal control system, and risk management system. As a representative of the board of directors and main part of the corporate governance mechanism the AC is involved in the organizations both internal and external audits, internal control, regulatory compliance and risk management (Alves, 2013; Al-Rassas & Kamardin, 2015; Aryan, 2015). Stakeholders expect loyalty and trust from auditor and AC while resolving financial facts and exposing at all fraud and fault in organization. The audit committee member's experience, relevant exposures, qualification background and in-depth knowledge need to be highlighted and confirmed because if directors are experts, experienced, qualified, financial wizards, then they can have vision and foresightedness to protect stakeholders (Alqatamin, 2018; Ghafran & O'Sullivan, 2013; Ghafran & O'Sullivan, 2017). If a company has an active and strong AC then independent auditors' working will be supported and at the same time enhancing the effectiveness of external audit.

Moreover, at the time of COVID-19, the ACs who are key component of effective governance, are faced with many challenges on their agendas than ever before as the pandemic has caused a strategic shift in their roles. The AC plays a key role in creating and maintaining a culture and environment that supports

the integrity and provision of decision useful information about an organization to its investors and other stakeholders (IFAC, 2020). Transparency is of heightened importance during this time of uncertainty and the AC need to be engaged and informed and receive actionable and timely information from management so they can effectively carry out their oversight role. AC are having to be vigilant on an expanding range of issues and review their agendas and priorities in response to COVID-19 (Delicata & Fenech, 2020; IFAC, 2020). However, at the same time they should ensure that they remain firmly focused on their fundamental responsibilities in respect to the oversight of financial reporting, audit process and internal controls, which have added complexities arising from the crisis. Additionally, with the new normal, AC have to adapt to working and fulfilling their responsibilities without meeting physically. This would mean embracing virtual meetings and much more frequent communication, particularly with the board, management, internal auditors, and external auditors.

AUDIT COMMITTEES IN ENHANCING THE ROLE OF EXTERNAL AUDIT

The rapid changes in business environment together with some adverse events that occurred in the corporate sector in the late 90s and during the global financial crisis in 2008 has put the audit committee (AC) in spotlight and since then the role of AC has been evolving and expanding in an attempt to enhance corporate reporting and governance and restore public confidence. The AC is seen as an operating committee of company's board of directors in charge of overseeing financial reporting and disclosure processes (Zraiq & Fadzil, 2018). AC authorities typically involve the oversight of financial reporting, monitoring of accounting policies, oversight of external auditors, regulatory compliance, risk management, and special investigations in cases of suspect or problematic accounting practices (Dezoort et al., 2002). Moreover, there is a range of views about the role of the AC, particularly in recent years: more attention has been paid to the role of audit committees across the world during the last two decades due to corporate scandals. The considerable number of studies have resulted in many views regarding this role (e.g., Alles et al., 2005; Lin et al., 2010; Tengamnuay and Stapleton, 2009; Fulop, 2014; Akinteye et al., 2015).

Accordingly, numerous regulators and researchers recommend that the AC should have a role in the

organisation of the work of the external audit. This role should include monitoring the independence, effectiveness and objectivity of external auditors (Sarbanes-Oxley Act, 2002; Smith Report, 2003) and making recommendations to the board in relation to the appointment and removal of external auditors (Beasley et al., 2009; Rezaee, 2009; Bédard and Compennolle, 2014). It is essential for an external auditor to be independent in the course of auditing in order to ensure true and fair view principle which is the key to enhance and meet the needs of various stakeholders. The AC should assess the independence and objectivity of the external auditor annually in compliance with relevant law, regulations and professional requirement (FRC, 2005). AC should also implement and review policies on relationship between the company and the audit firm including the supply of non-audit services which can easily affects the auditor's independence as seen in the case of Enron. This strengthens the auditor's independence from management and also enables the directors to gain better understanding of the audit functions (Mohamed & Mostaque, 2005).

Furthermore, among numerous criticisms levelled at majority corporate scandals in their financial reporting was the failure in internal audit function (Krishnan, 2005). Management is responsible for establishing and maintaining internal control properly and ACs should monitor and review the effectiveness of the company's internal audit function (FRC, 2010). The AC can strengthen the independence of internal auditors by reviewing internal audit plan and report, and ensuring that the scope and objective of the internal audit work adequately cover all areas of perceived risk. AC should also advice or recommend to management on any trends or current factors relevant to the company's activities market or other aspect of its external environment which is expected to or have increased the risk faced by the company (FRC, 2005). When the internal audit function is effectively managed, it will help the external auditors during their audit process and in return enhance the external audit function as well as the quality of the financial reporting in meeting stakeholders needs.

Moreover, empirical studies have found mixed findings in regards to the effectiveness of AC in enhancing the role of external audit. For example, several writers have focused on the importance of the AC in preventing fraud and errors in the financial statements; Beasley et al. (2001) state that companies investigated for financial statement fraud are less likely to have an AC,

while Xie et al. (2003) argue that AC plays a significant role in preventing (or revealing) any irregularities in the financial reporting process. Goodwin and Seow (2002) also conclude that AC have an impact on the detection of management fraud and errors in financial statements. They add that companies that have an effective AC seem to have a greater ability to avoid financial statement misstatements and to uncover fraud. However, on the other hand, for example, Alves (2013) and Stewart and Munro (2007) found that the presence of an audit committee is not associated with the quality of financial reporting. Study by Zraiq and Fadzil (2018) found that external auditors view audit committees as generally ineffective, while internal auditors view them more favourably in terms of effectiveness, especially in dealing with internal auditors and discussing the financial statements.

Similarly, in his survey of external auditors, Abdullatif (2006) found that the perceived benefits of audit committees were generally limited in terms of increasing auditor independence, the quality of financial statements, and the probability of detecting fraud and internal control weaknesses. Additionally, Masli (2018) found that AC in the Libyan banking sector are not performing to a satisfactory standard; they play too limited a role in monitoring financial statements and enhancing the external audit process, and their effectiveness is too dependent on the strength of their relationship with the internal audit department. AC can cause or create conflict within the company, as they have direct communication with internal and external auditors. If the management is not informed on the matters discuss, may become concerned that all relevant facts are not given due considerations and will think it's exposed to unjustified criticism without given opportunity to explain (Mohamed & Mostaque, 2005). Although the potential benefits of AC provide a compelling case for enhancing the role of external audit to meet stakeholder's needs, there are certain potential problems which need to be considered. AC may occasionally unwittingly assume management responsibilities even though have no executive power. This danger the independence of the AC and may collude with the management.

Furthermore, COVID-19 have no doubt impacted in the way external audit is conducted. These impacts can be categories into the mechanisms, practice methods and duties of auditing in the light of pandemic challenges. On the level of performance, technological progress has played an important role in preventing serious harms associated with auditing tasks which shall be performed. For example,

technology has contributed to the continuation of works, jobs and tasks although various precautionary measures, such as a lack of direct contact, have been taken because of COVID-19. The pandemic, therefore, accelerates the expansion of using electronic audit. For instance, electronic auditing will be used for performing audit tasks; electronic visual techniques will be used in order to perform audit processes such as inventory of goods; electronic authentications will be used as a type of audit evidence; artificial intelligence tools will be used for performing audit works and tasks (Al-Khasawneh, 2021). In addition, it will be noticed that developing and providing these techniques and programs will be demanded by audit offices in order to perform their tasks at a lower cost and in a timely manner.

Moreover, on task level, the companies, especially those affected by the pandemic, increasingly need external auditors who perform damage analyses in order to settle their situations. In the times of crisis such as COVID-19, financial report quality and corporate governance are main components of economy; in addition, checks and balances are required in order to increase confidence on the integrity of the financial report and to meet stakeholder's expectations. Companies need to communicate transparently on the impact of Corona pandemic on their works in terms of liquidity, business continuation, financial position and internal control. In this regard, the AC have to be vigilant on an expanding range of issues and review their agendas and priorities in response to COVID-19. For ACs, who are a key component of effective governance, COVID-19 is causing a strategic shift in their roles, with more on their agendas than ever before. But at their core, AC plays a key role in creating and maintaining a culture and environment that supports the integrity and provision of decision useful information about an organization to its investors and other stakeholders. Transparency is of heightened importance during this time of uncertainty (IFAC, 2020). AC are adapting their way of working to function and fulfill their responsibilities without meeting physically. This means embracing virtual meetings and much more frequent communication, particularly with the board, management, internal auditors, and external auditors. However, any additional responsibilities taken on by the AC need to be clear and carefully considered to ensure the committee is not overburdened, that it has the right experience and expertise, and that new responsibilities do not detract it from its core oversight responsibilities (IFAC, 2020).

CONCLUSION

Good corporate governance in companies help to improve the effectiveness of audit committee (AC) in meeting stakeholders' needs. The AC as one of the firm-level governance mechanism is seen as a pivotal attribute in enhancing and improving the quality of the reporting process that includes internal audit quality, external audit quality and financial information quality. External auditors are independent and legally required in order to ensure that the financial statement gives a true and fair view of the company's financial position and prepared in accordance with the accounting standards, thus addressing agency problem. It is essential for an external auditor to be independent in the course of auditing in order to ensure true and fair view principle which is the key to enhance and meet the needs of various stakeholders. The AC should assess the independence and objectivity of the external auditor annually in compliance with relevant law, regulations and professional requirement. However, the stakeholders and general public started losing confidence in audit profession more importantly misjudging the external auditor's performance due to increase in corporate financial scandals, relationship conflict with management, lack of independence, etc. AC can help in preventing financial fraud, thus improving the quality of financial reporting, strengthening the auditor's independence, maintaining a proper and healthy relationship and open communication between external auditors and management and reviewing the effectiveness of companies' internal audit function.

Furthermore, at the time of COVID-19 pandemic, the AC should embrace virtual meetings and established more frequent communication, particularly with the board, management, internal auditors, and external auditors. The changing nature of the current crisis requires more frequent updates from management. Ongoing engagement with internal auditors and external auditors is essential, to deal with emerging issues and uncertainties on an ongoing basis as they arise. Additionally, to enhance trust and transparency, the AC can play a crucial role in respect to broader corporate reporting, overseeing a wider set of business and reporting risks, and assessing the connectivity and consistency between information in the financial statements and other disclosures. For example, monitoring impact of COVID-19 on profitability, cash flow, capital preservation, and a renewed focus on the strength of the balance sheet,

as well as identifying early signs of financial stress, going concern considerations, and other financial reporting implications as a result of the pandemic, such as accounting estimates and events after the reporting period.

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The Influence of Facebook Apps and Activities on Purchase Intention: The Evidence from Cambodian Consumers

Mong Mara*

ABSTRACT

Facebook has been widely used as a marketing tool for online businesses in Cambodia. It has been utilized by business owners to create relationships with customers and build trust between business owners or retailers and their customers. This study aims to examine the most important Facebook features and activities that influence consumers' purchase intentions as well as the relationship between those factors and their purchase decisions. The data in this study was obtained from an online survey of 407 respondents in Cambodia who have had an experience buying products and services via Facebook online stores. The results indicated that sharing is the most important factor which influences consumers' decision on buying products and services and influences the future consumers' purchase decision. The other important factors are positive comments, number of likes, and friends' likes. However, location check-in does not have a significant impact on the consumers' purchase intention. These findings may contribute to online business owners' or retailers' insight of Facebook features with activities so that they can well strategize to maximize their online sales on the Facebook platform.

Keywords: Purchase intention; Facebook features

INTRODUCTION

Nowadays, social media plays an important role in our daily lives, and it is also defined by its interactivity, connectedness, and user-generated content. Moreover, social media is typically used for social interaction, access to news and information, as well as making decisions. It is an important communication tool among people locally and worldwide, sharing, creating, and spreading information. On social media, reviews from customers, marketing strategies, and advertising from sellers can affect what people decide to buy. According to Alalwan (2018), customers are more perceptually and behaviorally engaged with specific major social media platforms such as Facebook, Instagram, Snapchat, YouTube, and Twitter. Moreover, social media channels offer both online shopping stores and customers the new ways of engaging with each other. Online shopping stores expect to engage with loyal customers and influence individuals' perceptions about their products and services, spread information, and learn more about their audience (Schivinski & Dąbrowski, 2013).

Facebook was established by Mark Zuckerberg in 2004 when he was a student at Harvard University, USA. It is widely used around the world, and also viewed as a social media platform by many countries (Devanesan, 2020). Facebook may be used for many different purposes, like socializing, figuring out who you are, getting information, making friends, and just talking (Vorn & Ly, 2020). Cambodia has a large market share of people who prefer to use Facebook as their main communication tool in daily life. Cambodians use Facebook frequently since it offers many benefits. For businesses as well as marketers, it is used as a marketing strategy for online shopping since it allows retailers to display their products in several categories. By May 2022, the number of users in Cambodia had reached around 13 million, which is equal to 79.8 percent of the entire population in this same year (17 million), with men making up 55.1 percent of the total population and women making up 45.9 percent (Napoleon Sp. z o.o., 2022).

The Facebook company has created many tools or features on the Facebook platform to facilitate business activities, such as: the Facebook Marketplace, which was announced in 2016 and, three years later, was used by 800 million users in 70 countries around the globe each month (Deshpande, 2021; Pahwa, 2021); Facebook Shops, which was launched in May

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2020 and, shortly thereafter, available in Cambodia (B2B, 2020), Facebook Ads, which was launched in 2007 and allows sellers to advertise their products or service; Facebook Messenger, which was released in 2011 and allows users to send messages, photos, and share locations in a one-to-one and group chat; and Facebook Business Manager, which was launched in 2014 (Deshpande, 2021).

Facebook offers a variety of features that display information about an online business owner's word-of-mouth on each post. On Facebook platform, there are features such as the "Like" button, "Comment," "Share," and "Location check-in" that enable online consumers to interact. In addition to these features, "Friends' likes" is regarded as a driving factor behind online purchases by customers. Therefore, in order to highlight the importance of Facebook platform so that online shops in Cambodia can make the most of it, this study will look at Facebook features and users' intentions to buy specific goods or engage in specific activities.

Research Problem

E-commerce in Cambodia is on the rise as a result of the adoption of the advanced technologies and certain limitations brought on by the COVID-19 epidemic (Devanesan, 2020; Seakleng, 2021). In the Cambodian context, e-commerce is unlike typical e-commerce in other places like America and Europe; it combines social media with traditional methods of payment and delivery service (Seakleng, 2021). Facebook, which has a number of features and a user-friendly template for creating the content, is one of the most popular social media platforms for business owners in Cambodia to advertise their products and services to the majority of the country's people (Pholreaseyh, 2020). Therefore, the purpose of this study is to examine how various Facebook features and activities affect consumers' intention to buy products in Cambodia. The question under consideration is: "Do Facebook social media apps affect consumers' purchase decisions?" The study intends to help online stores in Cambodia figure out how important Facebook features are to their overall marketing plans and facilitate them raise customers' purchase intention and achieve their marketing objectives.

Research Objectives

The purpose of the study will be accomplished by meeting the following objectives.

1. Explore Facebook features and activities concerning online buying and selling products or services in Cambodian population.
2. Investigate how those Facebook features and activities affect the consumers' decision-making process of purchasing goods in Cambodian population.

LITERATURE REVIEW

Purchase Intention

According to Hutter et al. (2013) and Wells et al. (2012), purchase intention refers to the mental stage in the decision-making process where the consumer has acquired an actual willingness toward a product or brand. Grewal et al. (1998) determined that purchase intention is likelihood that customers would make a certain purchase based on their own actions. Schiffman et al. (2013) discovered that customers' decision to buy a product depends largely on the product's value and recommendations that other consumers have shared, for example on social media. The use of user-generated word of mouth (WOM) and business advertising (viral marketing) results in spontaneous forwarding and recommendations by users who deem the companies deserving of attention (Hoy & Milne, 2010). Hence, Facebook apps could help online shops to accomplish many marketing aims, such as creating customers' awareness, building customers' knowledge, shaping customers' perception, and motivating customers to purchase products (Alalwan et al., 2018).

Likes

The "Like" button on Facebook, which was introduced in 2009, is one of the features that allows users to easily connect photographs, comments, and status updates to their Facebook accounts or pages. The button received numerous additional emojis in 2016. Users can react to a post with "Like," "Love," "Haha," "Wow," "Sad," or "Angry" by pressing and holding on it (Hussain et al., 2020). As a "Like" button extension in 2020, a new sort of reaction called "Care" was added. As a result, when users tap and hold the "Like" button, seven emojis flash, through which users can select one to convey their sentiment to the content.

Once the page has been liked, the user may view other fans' activities on that business page through their personal newsfeed and get business updates (Nelson-Field et al., 2012). As a result, users will see advertisements for new products, sales, recommendations, and reviews from other users (Richard & Guppy, 2014). According to the research by Lee et al. (2015), Facebook "likes" increased traffic and purchases in social commerce, which in turn boosted sales. Bhattacharyya and Bose (2020) investigated how Facebook likes affect consumers' shopping decisions and discovered that a bigger amount of likes on Facebook increases the chance of making a purchase. Additionally, according to Coursaris et al. (2014), brand equity will favorably influence customers' intentions to interact with a company's social contact points. Such interaction may take the form of liking, commenting on, or sharing a brand's profile or message on a social media platform such as Facebook.

H1: The number of "likes" on a page or an item positively impacts the consumer purchase intention.

Friends' Likes

When a user clicks "like" on a post, it displays in their news feed and notifies their friends about what they "like" on Facebook. However, a user cannot see the number of likes or other types of reactions for the posts that the other users share if he or she chooses to hide the number via privacy setting. Likewise, the number of likes or reactions under posts a user shares to his or her profile cannot be seen by other users if the poster hides the number.

Mariani and Mohammed (2014) found a significant connection between a friend's endorsement "like" and purchase intention. In addition, Harris and Dennis (2011) stated that shopping online and shopping through social networks (social e-shopping) were emerging; however, two years later the consumers were likely participating in purchases through social networks, relying on their family and friends' recommendations through Facebook reactions. Kotler and Manceau (2012) also mentioned that the importance of social factors which included family and friends influences the customers in a future purchase.

H2: The number of Facebook friends' likes on a page, or a post positively impacts the consumer purchase intention.

Location Check-in

With the location check-in feature, which was launched in 2010 (Weir, 2022), Facebook users who are on-site or nearby can check in to a page's location. Consumers can communicate where they are, what they are doing at the property, and who they are with by using the location check-in feature (Phelan et al., 2013). This app boosts word-of-mouth and location knowledge, as well as allows shops to reach out to potential customers (Richard & Guppy, 2014). When users check in on Facebook, they share information about where they are. This could be thought of as another form of e-word-of-mouth, since online reviews, photos, and other digital artifacts are shared in online communities (Hennig-Thurau et al., 2004). In addition, the location information including users' instant and minimal reviews can be operated as evaluative pieces that are a part of community knowledge and influence community users' perception of the location (Nov et al., 2010).

H3: Location check-in positively impacts consumer purchase intention.

Positive Comment

Users can write a comment on a post on Facebook. The comment can be seen by the other users in the network (Debatin et al., 2009). Posting comments and product reviews on a platform is an example of electronic word of mouth (e-WOM) (Hennig-Thurau et al., 2004). The comments or reviews that consumers see when researching goods and services on Facebook may affect their decision to buy (Richard & Guppy, 2014). A positive comment or review about a product may encourage buyers to buy it, while a negative review would discourage them (Mas'Od et al., 2019).

H4: Positive comments on the products positively impact the consumer purchase intention.

Sharing

Using the "share" button, users may share the new content, including images, videos, and URLs. If the user clicks "share" on the post, the content is also posted on the user's own wall and sent to their friends' newsfeeds (Malhotra et al., 2013). It's important to note that Facebook's personal and social space shows the unique way that users share information about their experiences with businesses. Unlike the general e-WOM typically found in e-commerce websites or online forums, which are

open to anyone, locations shared by Facebook users are normally limited to the friends within the user's defined interpersonal network (Kim & Chung, 2018). Ewing (2013) and Fournier and Avery (2011) have noted that consumers actually take notice of people sharing their experiences through Facebook. It would be beneficial to test the impact of friends' sharing a post and non-friends sharing a post or a page on the purchase intention.

H5: Pages sharing or content sharing positively impacts consumer purchase intention.

RESEARCH METHODOLOGY

Study Population and sampling

This study attempted to analyze the effect of Facebook features and activities on the purchase intention of consumers in Cambodia. The data used in this study was obtained through a survey. The respondents in this study include Cambodian Facebook users. The study utilized non-probability sampling and online survey for the data collection.

Data Collection

The survey questionnaire includes two main parts: The first part is made up of questions designed to create constructs such as "Likes," "Friends' likes," "Location check-in," "Positive comments," and "Sharing," which are independent variables in the model, and "Purchase intention," which is a dependent variable. The second part is for demographic information like gender, age group, education level, and profession. This study utilizes the five-point Likert scale to rate each item with 1 "strongly disagree" through 5 "strongly agree." The items were adopted from Richard & Guppy (2014), plus newly added ones. There are three new items: one to be added to the construct "Likes", another to be added to the construct "Friends' likes," and the third to be added to the construct "Purchase intention"; and therefore, in this study there are 21 items (Appendix A).

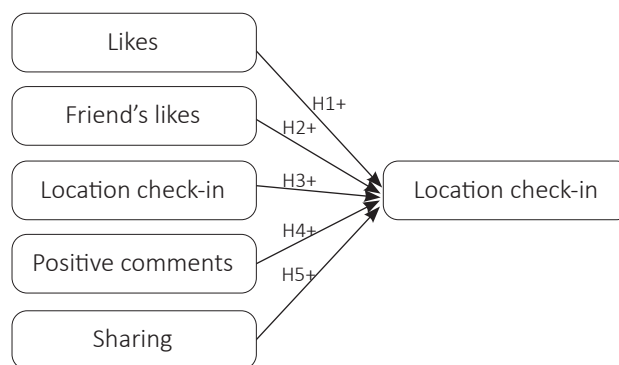
The data were gathered through a survey in which a self-administered questionnaire with questions in English along with Khmer translations was created in Google form and the link was distributed to various Facebook and Telegram groups. Respondents were asked to forward the link to others whom they think have the potential for the study.

The survey received 518 responses. There were no missing values nor outliers because restrictions on responses was set in the Google form. However, a number of cases were deleted from the sample due to what is called "respondent misconduct"; the respondents gave exactly the same score or almost the same to all items measuring the constructs. Collier (2020) suggests deleting the responses with a standard deviation of scores below 0.25. After cleaning the data, the number of valid responses used in the analysis was 407. The sample size of 407 is sufficient for the study. According to Cochran (1977), using 95% confidence level and the margin of error of 5% the minimum size of the sample drawn from an infinite population (or from a large population) was calculated to be 385.

Data Analysis

Prior to the analysis, data cleaning was implemented with Microsoft Excel 365. Demographic data were summarized using frequencies and percentages. Thereafter, the data analysis was done by using the partial least square structural equation modeling (PLS-SEM) technique, implemented with R software in RStudio, using a package named "SEMinR". The model for this study is presented in Figure 1.

Research Model for the study



Note: Adapted from the literature

Figure 1: SEQ Figure * ARABIC 1

PLS-SEM can link the set of independent variables to multiple dependent (response) variables, handle many independent variables, even when predictors show multicollinearity, and can be used as a regression model to predict one or more dependents from a set of one or more independents (Garson, 2016, p. 8). The main benefit of PLS-SEM is that it lets researchers estimate complex models with many constructs, indicator variables, and structural paths without making assumptions about how the data should be distributed (Hair et al., 2019).

The measurement model was evaluated by examining the indicator loadings, the internal consistency reliability, convergent validity, and discriminant validity. Finally, for the structural model, bootstrapping method was used to estimate the path coefficients, and then the model was assessed to determine which hypotheses are supported.

Bootstrapping, in a nutshell, is a non-parametric resampling process that analyzes the variability of a statistic by assessing the variability of the sample data, as opposed to adopting parametric assumptions to evaluate the precision of the estimates (Streukens & Leroi-Werelds, 2016). In reference to Mooney et al. (1993) and Wood (2005), bootstrapping has several significant benefits: 1) the approach is simple and doesn't require a lot of mathematical or probability theory expertise; 2) the method's statistical assumptions aren't very restricted; 3) bootstrapping is generally applicable and provides a solution in circumstances where conventional methods could be challenging or impossible to obtain (Streukens & Leroi-Werelds, 2016).

The item loadings, composite reliability (CR), Cronbach's alpha (CA), and the average variance extracted (AVE) were analyzed and shown in Table 1. These findings indicate that the measurement model has internal consistency and good composite reliability and convergent validity. Furthermore, the discriminant validity was also analyzed. This measure assesses how different a construct is from other constructs in the structural model empirically (Hair Jr et al., 2021). One of the assessment metrics is the Fornell-Larcker criterion which is called the traditional metric and found to have weaknesses as discussed by Hair Jr et al. (2021). Therefore, the discriminant validity of the model in this study was assessed by using heterotrait-monotrait ratio (HTMT). All the HTMT values are below the threshold value of 0.90. Moreover, no 95% bootstrap confidence interval contains the value of 1. These indicate that there is no discriminant validity issue (Henseler et al., 2015). Therefore, the measurement model assessment has at least a fairly good discriminant validity.

Table 1: Loadings, reliability, and validity

Construct	Item	Loading	CA	CR	AVE
Like (LK)	LK1	0.803	0.782	0.860	0.609
	LK2	0.808			
	LK3	0.850			
	LK4	0.644			
Friends' like (FL)	FL1	0.803	0.876	0.915	0.728
	FL2	0.856			

	FL3	0.893			
	FL4	0.860			
Location check-in (CI)	CI1	0.829	0.780	0.872	0.695
	CI2	0.803			
	CI3	0.868			
Positive comment (CT)	CT1	0.779	0.695	0.829	0.618
	CT2	0.763			
	CT3	0.816			
Sharing (SH)	SH1	0.861	0.811	0.888	0.726
	SH2	0.814			
	SH3	0.880			
Purchase intention (PI)	PI1	0.779	0.797	0.866	0.618
	PI2	0.782			
	PI3	0.752			
	PI4	0.828			

RESULTS AND DISCUSSION

Demographic Information

The respondents' demographic information, such as gender, age, education level, and occupation has been summarized using frequencies and percentages as shown in Table 2.

Table 2: Demographic information of the respondents

Variable	Category	Frequency	Percent
Gender	Female	218	53.6
	Male	180	44.2
	Unidentified	9	2.2
Age	Under 20	101	24.8
	20-39	265	65.1
	40-59	41	10.1
Education	High school or below	14	3.4
	Bachelors	322	79.1
	Master	58	14.3
	Doctorate	7	1.7
	Others	6	1.5
Occupation of Respondents	Public sector job	99	24.0
	Private sector job	94	22.8
	Student	182	44.2
	Businessperson	3	0.7
	Self-employed person	12	2.9
	Homemaker	7	1.7
	Others	15	3.6

Collinearity

Collinearity is a condition where two independent variables are correlated. When three or more variables are related, the condition is called multicollinearity (Sarstedt & Mooi, 2019). Therefore, multicollinearity refers to the situation in which three or more independent variables in a regression model are linearly related to each other (Sarstedt & Mooi, 2019; Shrestha, 2020). One of the assumptions in regression analysis is to check multicollinearity. In this research, the structural regression model with five predictor constructs, which are independent variables, was analyzed. According to Hair Jr et al. (2021) the collinearity in the model must be examined and the variance inflation factor (VIF) can be used as one of the tools for the assessment of collinearity issues. Hair Jr et al. (2021) mentioned that all VIF values should be less than 5 but according to Becker et al. (2015), and Mason and Perreault Jr (1991), collinearity can also happen with VIF values as low as 3-5. The VIF of each independent variable in this research model was calculated. The highest value of VIF is 2.639 for Friends' likes (FL), that is, all values are below 3. These results indicate that there are no collinearity issues.

Structural Model

To analyze the significant impact of LK, FL, CI, CT, and SH on PI, the path coefficients (standardized coefficients) of the model as shown in Figure 1 were estimated by using bootstrapping method (resampling) which adopted 10,000 bootstrap samples, the minimum number recommended by Hair Jr et al. (2021). The magnitude and sign of the path coefficients along with the t-values and the 95% confidence intervals are presented in Table 3. All independent variables, except for CI, have a significant impact on the dependent variable PI.

Table 3: The path coefficient and its t-value and the 95% CI

Path	Coefficient (t-value)	95%CI	Results
LK→PI	0.110 (2.371)	(0.020, 0.202)	Supported
FL→PI	0.107 (1.962)	(0.001, 0.214)	Supported
CI→PI	0.035 (0.610)	(-0.079, 0.147)	Not supported
CT→PI	0.165 (3.413)	(0.071, 0.260)	Supported
SH→PI	0.409 (6.680)	(0.291, 0.529)	Supported

Note: 95% CI = 95% Confidence Interval

The coefficient of determination (R^2), which is the proportion of the endogenous variable's variance and is also known as the model's exploratory power with regard to that endogenous variable (Hair Jr et al., 2021) is 51.9%. This magnitude of the proportion is adequate; that is, it is above 10% (Falk & Miller, 1992). Sharing (SH) has the most significant positive impact on purchase intention (PI). The second largest impactful factor is positive comment posting (CT), next number of likes (LK), and lastly Friends' likes (FL). The impact of location check-in (CI) on the purchase intention is not significant. The full model is presented by the diagram in Figure 2.

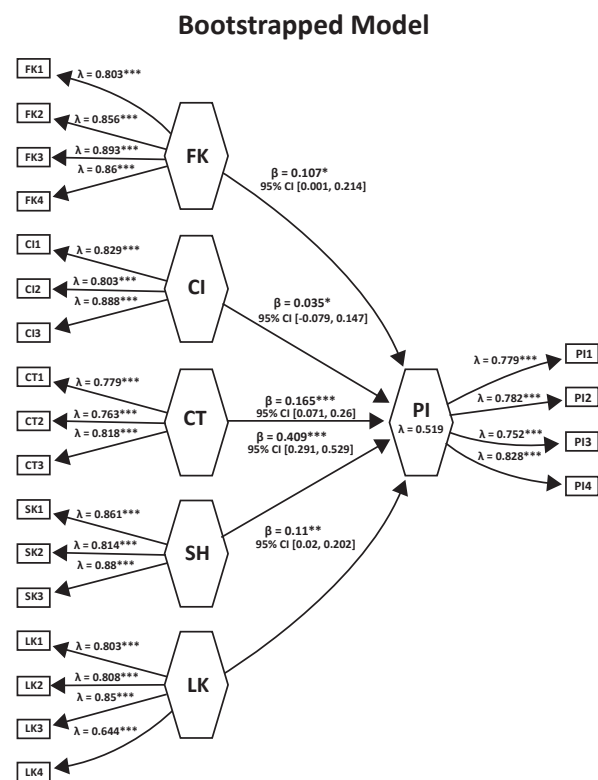


Figure 2: Full model of the study

Note. This figure is the output of RStudio. The thickness of the arrows represents the significance of the coefficients in the model.

* $p < .05$. ** $p < .01$. *** $p < .001$.

The goal of this study is to determine how different Facebook features and activities influence Cambodian consumers' propensity to purchase goods.

Hypothesis 1 (H1) is supported. Liking a Facebook page or post positively impacts the purchase intention. This finding is consistent with the finding of Richard and Guppy (2014) who discovered that an advertisement

of new items, discounts, recommendations, and reviews by others will be seen by the user. This finding agrees with Nelson-Field et al. (2012), who discovered that when a page has been liked, the user receives business updates and the ability to observe other fans' activity within that business page through their newsfeeds.

Hypothesis 2 (H2) in this study is supported. The number of friends' likes has a positive relationship with purchase intention. This result is in agreement with a previous study by Mariani and Mohammed (2014), who found a significant connection between a friend's endorsement "like" and purchase intention. According to Kotler and Manceau (2012), family and friends influence the customers' future purchases.

Hypothesis 3 (H3) is not supported. The study concludes that the relationship between location check-in and purchase intention is not significant. This finding is in contrast with Richard and Guppy (2014), who revealed that this Facebook feature boosts word-of-mouth and location knowledge, as well as allows shops to reach out to potential customers. However, Slutsky (2010) mentioned that customers used the check-in function just to get the traditional coupons and a discount for their purchase of goods. Besides that, Bai and Sun (2021) also stated that a location-based social application indeed provides users with a platform to present themselves and document their daily life to become a repository of individual memories and storytellers in their personal lives. On the other hand, the Facebook location check-in feature can contribute to memory storage by offering new ways for users to record current feelings, ideas, and experiences, especially those related to places, and it is not relevant to future purchases of goods.

Hypothesis 4 (H4) is supported. The positive comments posting has a significant positive impact on consumer purchase intention. The result agrees with Debatin et al. (2009), who stated that comments can be seen by the other users in the network. Hennig-Thurau et al. (2004) also found that leaving a positive comment or writing a product review on a platform is an example of electronic word-of-mouth which affect consumer decisions to purchase.

Lastly, hypothesis 5 (H5) is supported. The result indicates that page sharing, or content sharing, has the most impact on future purchase intention. The research finding is also consistent with Fournier and Avery (2011) and Ewing (2013), who have noted that consumers take notice of people sharing their

experiences through Facebook. So, sharing on Facebook makes consumers more interested and helps each Facebook post reach more customers.

Implication

The potential of Facebook features and activities as a mechanism to affect consumers' purchase intentions should be recognized by researchers when most consumers express interest in the number of likes, the number of friends' likes, comments, shared posts, as well as any type of business or pop-up advertisement on Facebook. Marketers in Cambodia may utilize this information to build and improve their business pages to get more traffic or customer interaction by creating new contents and posting more frequently to attract more page views. The online shops can invite famous influencers to make a short video and use their photos to promote their products and services to interact with Facebook's users. Facebook advertisements should be bought by retailers on the social media platform since it has a big impact on consumer's intention to purchase.

LIMITATIONS

This study was conducted with the analysis of the primary data of consumers in Cambodia who have experience with Facebook online shopping, which is based on some Facebook features and activities: likes, friends' likes, positive comment posting, sharing, and location check-in. There are several limitations to this study. Facebook may introduce more features; an example is the automatic response sent to Facebook Messenger when a user clicks a post. Those new features of Facebook applications should be included in the model for future study. On the other hand, since the purchase intention can be thought of as the mental stage of making-decision, there could be a difference due to the gender, age group, or social status of the consumers. Therefore, the model in the research should be extended by considering these factors. Furthermore, Facebook usage may be impacted by culture; hence, this study should not be extrapolated to populations from other cultures. In addition, future research on online shoppers' purchase intentions may also consider different platforms like Instagram, TikTok, or others as well.

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