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The Influence of Internet Finance on the Profitability of Commercial Banks in China

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ABSTRACT

The emergence of internet finance is dominating the commercial bank's market and replacing some of its roles. Hence, this study intends to investigate the impact of internet finance services; 1) third-party internet payment) and 2) peer-to-peer (P2P) online lending, towards commercial banks in China. Therefore, this study aims to analyse the impact of (1) third-party payment and (2) P2P online lending on the profitability of commercial banks, and (3) to investigate the different impact of internet finance on profitability of commercial banks by types. This study uses EViews to regress the annual data of 16 commercial banks in China from 2008 to 2018. The dependent variable is Return On Assets (ROA) of commercial banks. The independent variables are third-party internet payment and P2P online lending. In order to preserve the fairness in findings, total bank assets, non-performing loan ratio and gross domestic product growth were set as the control variables. The findings highlight that third party internet payment has a significant negative effect, while P2P online lending exhibits a positive effect on the banks' profit. Moreover, the effect varies with *different types of banks. Joint-stock commercial banks are more affected by third-party payment, and obtain relatively smaller profit from P2P online lending in comparison with state-owned banks. This study solidifies that internet finance does affect commercial bank's profit and commercial banks should mutually cooperate with Internet finance platforms to capitalise on its development.*

Keywords: *third-party payment, P2P online lending, profitability of commercial banks, random effect model*

INTRODUCTION

Finance plays an important role in the modern economy. It serves the present economy better through the strong information processing capabilities of the modern telecommunications infrastructure (Xu, 2017). As information technology develops, so does internet finance. Internet finance is a new type of financial business intermediary, which employs internet tools to execute financing, payment and settlement, and information exchange (Shen & Huang, 2016). In the early stage of the development of internet finance, traditional financial institutions used the internet to reduce business transaction costs and improve efficiency.

With the continuous development of mobile communication technology, internet finance has expanded its reach. Among the three internet giants which are responsible in the finance technology (FinTech) revolution in China are Baidu, Alibaba and Tencent. Many internet-based companies which are not traditional financial intermediaries, independently provide financial services, such as financial settlement, financing and payment services. This created a strong impression on the traditional financial industries. Internet finance uses the internet platforms to carry out financial services which leads to financial disintermediation. The business structure of internet finance industry in China is shown in Table 1 (Liu, 2018).

The E-commerce market flourished in China in 1999. This led to the shift from personal computers to mobile devices in 2009, which possesses greater processing power to enable financial innovations in China. With the establishment of Yu'E Bao (a Chinese money market fund) in 2013, internet finance entered the stage of prosperity. Numerous internet financing products and platforms followed suit, such as, Ant Financial, Lufax, JD Finance and Qufenqi. This has exerted impacts on the traditional financial industry, positively and negatively. From the positive perspective, internet finance has continuously extended the industrial chain of traditional financial industry, expanded the development space, and improved service efficiency. However, from the traditional finance point of view, internet finance is penetrating into its territory, eating up its market and replacing some of its roles.

Table 1: Business Structure of Internet Finance in China

Types of Business	Traditional Financial Institutions	Internet-based Enterprises
Payment	Online banking payment	Third-party online payment
	Mobile-banking payment	
Financing	Online-loan	Peer-to-peer online lending
		Crowd-funding
		E-commerce micro loans
Financial management	Direct bank	Internet money fund
	Internet insurance	Investment and financial management platform
	Internet trust	Non-standard financial management

E-commerce giants, such as, Alibaba, Tencent, Baidu, Sina showed their competitive capabilities by creating new frontiers in the internet field of finance. Internet financial products and services provided by them include third-party online payment, peer-to-peer online lending, crowd-funding and internet money market funds. All these are similar with the products that are offered in the commercial banks minus the inefficiency, such as, bureaucracy and excessive paperwork. According to statistics from iResearch, the number of third-party mobile payment transactions in China reached 190.5 trillion transactions in 2018, an increase of 36.9% year-on-year. At the same time, the number of third-party internet payment transactions reached 29.1 trillion transactions, an increase of 3.8% year-on-year. The transaction amount of

P2P lending reached 1.7 trillion yuan in 2018. Due to high efficiency and convenience, these e-commerce companies were more preferred by the customers. The rapid development of internet finance is inevitable and its impact on traditional financial markets, especially the commercial banks, should not be taken lightly.

As a center of financial system, commercial banks are of great significance to the stability of the financial system in China, and its profitability is key to its survival. Commercial banks in China have also began to use the internet platform in providing their products and services. For example, in the year 2000, Industrial and Commercial Bank of China launched its personal online banking business, providing services, such as, personal transfers, inquiries, and remittances (An, 2020). The bank's internet business has been enriched, presently, covering account management, transfers and remittance, online payments, online shopping, online wealth management, and online loans. Commercial banks have equipped themselves with basic proficiencies in developing internet finance, cultivated technical talents, in addition to their huge capital and customer database.

To date, few studies have been conducted on the impact of internet finance on banks due to its relatively short history. Most of the research focused on banks' adoption of internet technology, however, little attention was given on the effect of internet finance on profitability (Chen, 2018). Thus, the main contribution of this study is to analyse the influence mechanism of internet finance on banks' profitability.

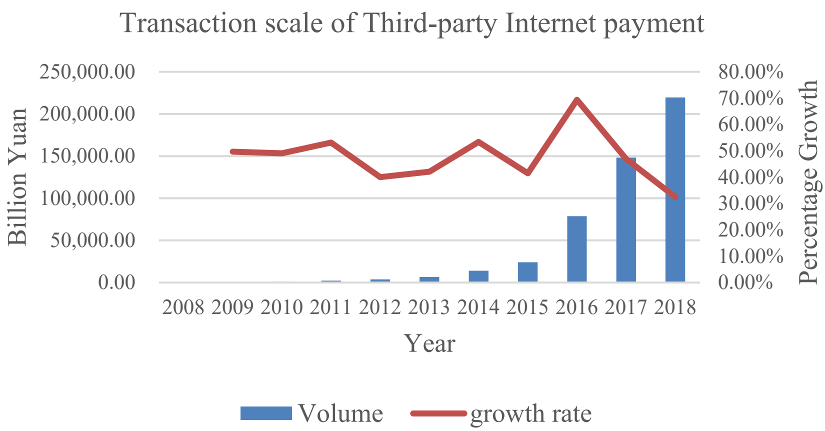
Overview of the Development of Internet Finance in China

The development China's internet finance can be divided into three stages: the first stage is before 2005, during which, traditional financial institutions employed internet their business operation. This era witnessed the birth of online banking industry. Around the same period, in 2003 and 2004, Taobao and Alipay came into picture, and initiated e-commerce as a new business operation model in China. The second stage was between 2005 until 2012, during which, internet finance gradually penetrated the financial intermediary business domain; with the birth of numerous third-party payment platforms. In addition, new forms of internet finance, such as, online loan platforms, and crowd-funding emerged, one after another.

The third stage was after 2012, during which, third-party payment was standardised and P2P platforms developed rapidly. With the launch of Yu'E Bao, the internet finance was developing at an intense pace.

The Mode of Internet Finance and Development Status

Internet finance can be mainly summarised into three categories: 1) third-party online payment, 2) internet financing, and 3) internet investment and wealth management (Liu, 2018). Third-party payment is a payment transaction platform established by internet-based companies which helps customers complete currency payment and settlement in a short time. It also plays the role of credit and technical guarantor. As an intermediary agency, third-party internet payment eliminates the inconvenience, reduces the payment cost, and improves payment efficiency through resource integration.

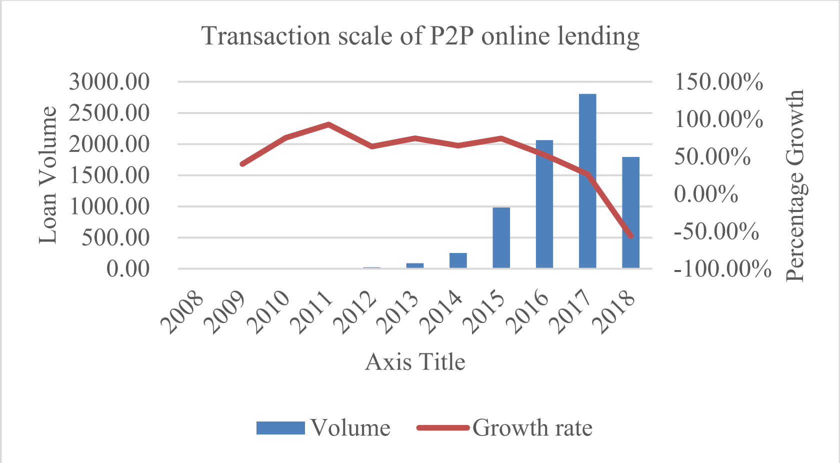


Note: Statistics of enterprises do not include banks.
Source: Official website of iResearch

Figure 1: Transaction Scale of Third-party Internet Payment (Unit: Billion CNY)

China's third-party online payment market developed rapidly and has become an important part of China's financial system. By the end of 2018, China's central bank (People's Bank of China) issued a total of 271 internet payment licenses. There are, presently, 238 valid payment licenses in China. The payment business mainly comprises of third-party internet payment and third-party mobile payment. According to 2020 China's Third-party Payment Industry Report issued by iResearch, Alipay and Tenpay have the monopoly on the third-party payment market in China. In 2019, the two giants accounted for 93.8% of the mobile third-party payment market in China. According to Analysis of the Digitalization Process of the Internet Payment Industry issued by Analysys, Alipay ranks first in the internet payment market with 23.55%, followed by Tencent Finance with a market share of 23.27% by the end of 2018. As shown in Figure 1, the transaction scale of third-party payment in China has been developing rapidly in recent years, reaching 219,600 billion yuan by the end of 2018.

Internet financing is the second component of internet finance. It can be divided into three areas: a) peer-to-peer lending, b) crowd-funding and c) E-commerce micro credit . Crowd-funding mainly targets small enterprises and individuals. It obtains funds from the public to ensure the completion of the project. E-commerce micro loans is based on platform data processing. With the help of cloud computing technologies such as big data and cloud computing, it assesses the credit history of customers and issues loans.



Source: Official annual report of online lending sector

Figure 2: Transaction Scale of P2P Online Lending (Unit: Billion CNY)

P2P lending provides funds for both the supply and demand parties to complete their transactions with the help of online platform, and charge fees for it. P2P online loan is currently the largest category in the internet financing market. Online lending has become widespread, and the whole industry has entered a stage of rapid development since 2013, as shown in Figure 2. More than three thousand P2P lending platforms have sprung up in China, peaking in 2015. However, due to the lack of supervision, imperfect review mechanism, opaque trading information on the platform, illegal appropriation of customer funds, regulators have carried out a special reform in April 2016 to regulate and supervise P2P online lending.

Internet investment and wealth management business is the third internet finance component. This refers to the internet platforms which provide users with intelligent investment recommendation and wealth management services using internet technology and big data. Users can purchase financial products in the financial market through the internet platform, such as, funds, trusts, and insurance. According to the Statistical Report on Internet Development in China (the 43rd) issued by CNNIC, by the end of 2018, the number of internet wealth management users was 151.36 million users, an increase of 22.55 million from 124.81 million at the end of 2017. This represents an increase of 22.55 million users with a growth rate of 17.5%. The transaction amount of the internet wealth management market was 950 billion yuan in 2013, while in 2018, the transaction scale of reached 17,800 billion yuan.

Types of Commercial Banks in China

To add depth to the research, the influence of internet finance on different types of banks are also analysed. The commercial banks in China can be divided into a) state-owned, b) joint-stock, c) urban and d) rural commercial banks. These banks are differentiated based on their background, shareholders and asset size. This study focuses on state-owned and joint-equity commercial banks due to their substantial asset sizes and line of business. A state-owned commercial bank is a wholly state-owned commercial bank. Its characteristics are reflected in all its capital is obtained from the state. State-owned commercial banks make the main body of China's banking system. They are in an absolute monopolistic position in terms of the number of personnel and institutional outlets, as well as, in asset size and market share. They play a pivotal role in China's economic and financial development (Pan, 2017).

The five state-owned commercial banks controlled by the state are vital for the national economic construction. They have the inherent advantages of government support with minimal constraints in budget. Even with a loss, they can still rely on the government to make up for their shortcomings. Government support has further improved the status of large banks in the financial system. However, due to excessive reliance on government support, the state-owned commercial banks lack market incentives and new impetus (Pan, 2017). Their internal operating mechanisms are severely bureaucratized, and have crude corporate governance mechanisms. Their asset size accounts for 40% of the financial sector assets in China, and occupy most market shares. At present, they have all been public listed.

A joint-stock commercial bank is a type of commercial bank with non-state-owned capital participating. The organisational form of a joint-stock bank is similar to that of a joint-stock company. It is issued in accordance with the stock system and is created by using share capital. A joint stock bank is an independent legal entity and enjoys the rights and obligations stipulated in the banking law. Its capital does not depend on the personal property of the shareholders and exists independently. Joint-stock commercial banks have become a dynamic force in China's commercial banking system and an indispensable part of the development of the banking industry and even the national economy.

The joint-stock commercial banks are relatively smaller in size, with fewer preferential policies and lower market positions. They are responsible for their own profits and losses in their operations. In the fierce market competition, they will be more affected compared to large state-owned banks. Joint-stock commercial banks, which are market-oriented, have more efficient corporate-governance mechanism. They pay more attention on efficiency and innovation, and possess higher flexibility in operation and management in order to be able to respond to market requirements.

Problem Statement

As an emerging financial model, internet finance influences traditional financial institutions and services of commercial banks in China with its unique business models and value creation methods (Liu, 2018). Internet-based companies have brought on a huge impact on commercial banks.

Third-party payment services, internet financial management services and Internet financing services are increasingly growing and are consuming the market share of the commercial banks. Not wanting to be left behind, traditional financial institutions are also adopting the internet to improve their operating efficiency and financial services. Nonetheless, the influences of internet finance are different for large commercial banks and joint-stock commercial banks, due to their different property structure, position in the market, and business models.

The rapid development of internet-based companies has had an impact on the traditional banking industry. It would be interesting to find, whether internet-based companies affect the profitability of traditional banks and whether the impact is different on different types of banks.

Objectives of the Study

This study explores the influence of internet finance and its impact to the business of traditional commercial banking in China. It investigates whether internet finance has an impact on the profitability of commercial banks. The objectives of this study are:

1) To study the impact of third-party payment on profitability of commercial banks in China.
2) To find the impacts of peer-to-peer online lending on the profitability of commercial banks in China.
3) To further explore the different impact of internet finance on profitability of commercial banks by types.

Significance of the Study

In the current information era, internet finance which has been quickly recognised by the market for its convenient, fast, and low transaction costs, has had a profound impact on people's lives and the traditional financial industry. It is driving the innovative development of financial industry, and promoting economic growth. Most of the existing researches look at the development of internet finance as both challenges and opportunities for commercial banks. However, how much internet finance influence the profitability of commercial banks, remains to be further explored. Due to its short history, most of the discussions in the literature are limited to the analysis of the mechanism of internet finance with not many empirical evidence. This study empirically analyses the impact of internet finance on commercial banks which will supplement to previous related research and contributes towards future studies.

LITERATURE REVIEW

Commercial Banks' Profitability

Profitability is an important indicator in measuring the performance of banks (Bordeleau & Graham, 2010). The profitability of commercial banks is mainly supported by three major businesses: asset business, liability business and off-balance sheet business (Zhang, 2011). The asset and liability business bring interest margin income to banks, while the off-balance sheet business generates huge non-interest income. For commercial banks, the main source of income is the spread of bank deposits and loans, which is the main component of bank income (Norden *et al.*, 2014; Zhang, 2011).

There are extensive researches which investigate the factors that influence commercial banks' profitability at home and abroad. Most of them use Return on Assets (ROA) and Return on Equity (ROE) to measure bank's profitability (Bordeleau & Graham, 2010). Golin (2001) reported that ROA is the best indicator in evaluating the profitability of banks. The factors that influence the profitability of commercial banks can be divided into two categories: 1) macroeconomic environment and 2) bank-specific determinants (Ong & Teh, 2013). The macroeconomic factors include interest rate levels, economic growth, and inflation rate, while the bank-specific factors include bank size, liquidity, capital adequacy, and leverage among others.

Boyd (2001) found that the economic growth rate and interest rate level showed a significant positive correlation with commercial banks' profitability, while the profitability of commercial banks will decline after offsetting the effect of inflation.

The Impact of Internet Finance on Bank Profits

Internet finance has transitioned itself from being a nonentity, to its current indispensable state. Many scholars agree that the development of internet finance introduced a huge shock on China's traditional financial industry. Internet finance has its unique advantages in some aspects compared with traditional finance. Li (2015) believed that internet finance has the characteristics of inclusiveness, low cost, high efficiency and convenient services, and it also alleviates information asymmetry. The business model of traditional banks includes to use of information asymmetry between the supply and demand of funds. internet finance can greatly reduce information asymmetry which will compress bank asset business, divert liability business, and replace intermediary business of traditional commercial banks, and therefore has a profound impact on commercial banks (Zheng, 2018). Internet finance diverts the deposits of commercial banks through its channel, information technology, capital, and customer superiority, which changed the monopolistic structure and profitability of commercial banks.

Yang (2017) used the data of 16 listed banks and studied the relationship between typical models of internet finance and the profitability of commercial banks and found that the higher the degree of internet finance development is, the lower is the profitability of commercial banks. The rapid development of third-party payment has a certain impact on the business of commercial banks, and ultimately affect the profitability of commercial banks (Xie, Zou & Liu, 2012). The development of internet finance will reduce the income of commercial banks, and the financial intermediary status of commercial banks is facing certain threats (Zhou, 2013). Based on data of commercial banks in China from 2006-2014, Wang, Shen and Huang (2016) designed a dynamic panel model that included internet finance indexes model and found the internet finance creates a more significant negative effects on deposit and lending business of commercial bank.

However, there are many studies which state that the internet finance provides opportunities to commercial banks, and does not affect their profitability. Xiao (2016) believes that although the internet finance has made great development, commercial banks have experienced decades of accumulation, and their business and profit model will not flounder in the short term. Instead, it would be impossible for internet finance to completely replace traditional finance. It can only be a beneficial supplement to traditional finance (Zeng & Hu, 2014). Lee (2009) believes that internet finance and commercial banks have a win-win relationship. The innovative development of internet finance provides financial business with a good opportunity. Geng (2014) empirically analyses the future development trends and development factors of commercial banks through P2P lending and third-party payment, and the result shows that internet finance could enhance the profitability of commercial banks.

The Effect of Internet Finance on Different Types of Banks

State-owned commercial banks and joint-stock commercial banks are different in terms of resource constraints, property rights structure, market position and business model. Based on the data of 110 commercial banks in China from 2013 to 2017, Ye and Huang (2019) adopts the generalised moment estimation method to study the impact of the development of internet finance on the profits of commercial banks. The results show that the profitability and profit structure of joint-stock banks and city commercial banks are affected the most by internet finance. The state-owned commercial banks (which possess large assets and secure customer viscosity), and rural commercial banks (with the characteristics of geo-economic restrictions, slow information circulation, poor hardware facilities) are the least affected. In another research, Zhao (2017) find that internet finance could improve the overall profitability of commercial banks while its impact on the profitability of state-owned commercial banks is not significant.

Strategies for Traditional Financial Institutions (Commercial Banks)

Traditional financial institutions have their own unique advantages in adopting internet finance (Liang & Shen, 2013). Commercial banks should pay attention to the core competitiveness of the internet, understand the reasons for the popularity of internet finance, and combine the inherent advantages of banks to create a win-win situation. Commercial banks possessed the upper hand compared to internet finance companies, such as, huge customer base and reputation. They should develop their own internet finance and build a new financial ecosystem to leverage on their strengths and promote the transformation of their business models.

THEORETICAL FOUNDATION

Modern Financial Intermediation Theory

The Financial Intermediation Theory mainly articulate that bank collects deposits and then lend them out. The theory looks at reducing investors' economic costs and loss due to information asymmetry. Commercial banks can reduce transaction costs and solve the information asymmetry problem in the financing activities via internet finance. Moreover, they can optimise resource allocation and improve their operating efficiency in the market. However, the bureaucratic ineffectiveness, such as, customer information screening, credit risk management, and non-performing loan processing have contributed towards excessive transaction costs for commercial banks and reduced their profits.

The emergence of internet finance poses a challenge to the traditional financial intermediaries (Bai, 2014). Internet finance relies on information and network technologies. These contribute towards making information resources more transparent, reducing information asymmetry, and making accurate match between both surplus and deficit parties. Internet finance provides online trading platforms, and can meet customer financial needs in a short time, which significantly reduces the transaction costs and improves transaction efficiency (Sun, 2019). Therefore, the emergence of internet finance speeds up the process of financial disintermediation, and the role of traditional financial intermediaries has been further obfuscated.

THE INFLUENCE MECHANISM OF EXTERNAL INTERNET FINANCE

The main research objective of this study is to find the impact of internet finance on the profits of commercial banks. The profit sources of commercial banks from three aspects: asset business, liability business and intermediary business.

Third-party Payment

With the development of internet finance, especially payment functions, third-party payment and settlement businesses have also had a profound impact on bank liabilities. The third-party payment which is established on e-commerce platforms, such as Alipay and Tenpay. The distinguishing feature of third-party payment is that there is a time difference between the buyer's payment and the seller's collection. For example, when transaction that takes two to seven days to complete takes place, Alipay, as an intermediary between buyers and sellers, absorbs the funds paid by buyers which is yet to be passed to the seller. In order to obtain profits, Alipay will deposit the funds as fixed deposits with higher interest rates. In the end, the demand deposit which used to be of low interest rate has morphed into a form of an agreement deposit with a higher interest rate. This, among others, pushes up the cost of debt of commercial banks.

Intermediary Business

The income of intermediary business for commercial banks is realised by handling the payment and settlement business for the customer, completing the customer's entrusted agency business and providing various financial services. The intermediary business of traditional commercial banks mainly include bank card business, agency business, custody business, payment and settlement business and consulting business.

Third-party payment represented by Alipay provides the same or similar services as commercial banks at a lower price, and it is faster and more convenient. Moreover, the third-party payment not only provides payment and settlement services, but can also combine credit evaluation and guarantees, which makes online transaction payments safer and more reliable, and gets more and more popular with users. It has led to a decrease in the bank's settlement business income to a certain extent. By providing customers with financial products with high yield and convenient investment, internet wealth management business competes with intermediary business, such as, agency sales and wealth management services, thus reducing the fee income and commission income of commercial banks. Contradictorily, the internet financial companies rely on banks to carry out their business to a certain extent. For example, the funds of P2P online lending must be deposited in banks, and third-party payment companies must conduct funds clearing through the banking system. Therefore, the cooperation between the two can bring certain intermediary business income for commercial banks.

CONCEPTUAL FRAMEWORK

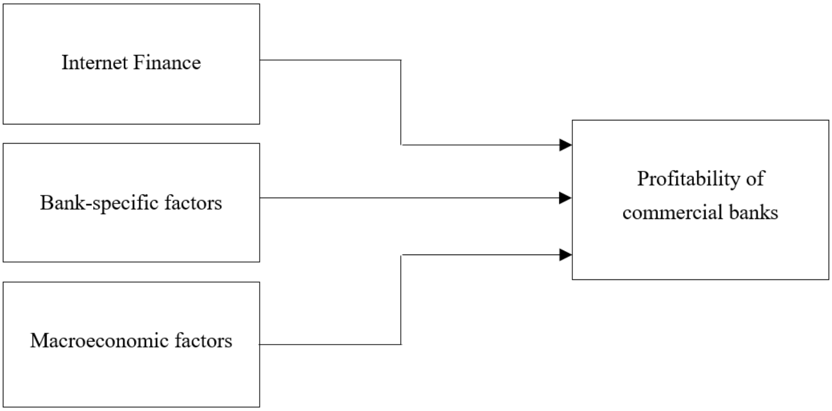


Figure 3: Conceptual Framework

The conceptual framework illustrated the impact of internet finance, bank-specific factors, and macroeconomic determinants profitability of commercial banks as show in Figure 3. On the basis of previous studies, the explanatory variables with expected signs are derived to guide the hypotheses constructed in this study to explain the influence on the profitability of commercial banks in China.

HYPOTHESES

The Third-Party Payment (TPP) platform has the advantages of convenience, efficiency, and high yield, which makes it divert the deposit business of commercial banks. In addition, it also competes with the payment and settlement business of commercial banks and intermediate businesses, thereby reducing the bank's net interest income and non-interest income at the same time and reducing the bank's profitability. As such, the first hypothesis is as below.

H_1: The transaction volume of the Third-Party Payment (TPP) has a negative impact on the profitability of commercial banks.

P2P online lending uses big data and cloud platform technology to provide funding sources for individuals, and small and medium enterprises that have difficulty in obtaining financing from commercial banks. On the one hand, it has had an impact on the lending business of banks. On the other hand, because the P2P online loan platform integrates the upstream and downstream of funds, some bank deposits are also transferred to the platform, reducing the bank's net interest income, thereby reducing the bank's profitability. Below is the second hypothesis of the study.

H_2: The transaction of P2P online lending has negative impact on the profitability of commercial banks.

The sample commercial banks selected in this article can be divided into the following two categories; large state-owned commercial banks and joint-stock commercial banks. Different types of banks have large differences in many aspects, such as differences in market size and business models. Because of the many differences in these aspects, the impacts are also different. Therefore, internet finance should have a differentiated impact on different types of banks. The third hypothesis is as below:

H_3: The influence of internet finance varies from different types of banks and joint-stock commercial banks is more affected.

METHODOLOGY

Data Selection and Sources

Table 2: Sample Banks

Type of banks	Name of Banks	Date Formed
State-owned bank	Bank of China (BC)	05/02/1912
	Agriculture Bank of China (ABC)	1951
	Industrial and Commercial Bank of China (ICBC)	01/01/1984
	China Construction Bank (CCB)	01/10/1954
	Bank of Communications (BCM)	01/04/1987

Joint-equity commercial bank	China CITIC Bank (CITTC)	28/02/1987
	Ping An Bank (PAB)	28/12/1987
	Industrial Bank (CIB)	08/1988
	China Minsheng Bank (CMBC)	12/01/1996
	China Merchants Bank (CMB)	08/04/1987
	Shanghai Pudong Development Bank (SPDB)	09/01/1993
	Hua Xia Bank (HXB)	10/1992
	China Everbright Bank (CEB)	08/1992
	China Bohai Bank (CBHB)	12/2005
	China Guangfa Bank (CGB)	09/1988
	China Zheshang Bank (CZB)	1993

The data in this study include annual data of state-owned commercial banks and joint-equity commercial banks. The period of the study is from 2008 to 2018. The development of internet finance is measured by the transaction volume of third-party payment and P2P online lending. The data is extracted from official website of iResearch and Analysys International. Given the standardisation of the bank's information disclosure system and the possibility of obtaining complete data of commercial banks, this study selects five state-owned commercial banks and 11 joint-equity commercial banks as a research sample. The data for banks are derived from annual reports of banks and macroeconomic data comes from EPS data. The information of banks is presented in Table 2.

Variables Selection

Dependent Variable

Profitability of commercial banks is used as the dependent variable. Profitability is the ability of a bank to generate revenue with its own and foreign capital. Prior studies related to banks' profitability used ROA and ROE to measure profitability (Sun, 2019). ROE is a measure of how effectively a bank uses shareholders' equity to produce income. ROA is a ratio that reflects the ability of commercial banks to use all assets to make profits. The higher the value, the stronger the profitability of commercial banks. The income of commercial banks is mainly based on attracting deposits and issuing loans (Liu and Lin, 2016). Sun (2019) believe that ROA can better reflect the profitability of the bank. Thus, ROA is selected as dependent variable to measure the profitability of commercial banks.

Independent Variable

China's internet finance mainly comprises of third-party payment and P2P lending as the two main platforms (Fan and Lin, 2019). They are relatively large in scale with long history and have conformed to a certain standard compared to other channels in internet finance. Third-party internet payment and P2P online lending have been selected to measure the development of internet finance, in line with Fan and Lin (2019).

Control variables

To better estimate the impact of development of internet finance on the profitability of commercial banks, three control variables from micro-and-macro aspects are chosen in this study, i.e. GDP growth, bank size, and bank risk. Table 3 depicts the variables used in this study.

Table 3: Variables Description Table

Type	Variable name	Proxy	Description
Dependent variable	Profitability	ROA	Return on total assets (Total profit + interest income) / Total assets
Independent variable	Development of Internet finance	lnTPP	Logarithm of transaction volume of third-party internet payment
		lnP2P	Logarithm of volume of peer-to-peer online lending
Control variable	Economic growth	lnGDP	Logarithm of gross domestic product
	Bank size	lnTA	Logarithm of Total assets of banks
	Bank risk	NPLR	Non-performing loan / total loans × 100%

Model Specification

The panel data regression method is used for analysis. The following are the regression models for this research:

Model 1: $ROA_{it}=\alpha_0+\alpha_1 lnTPP_t+\alpha_2 lnTA_{it}+\alpha_3 NPLR_{it}+\alpha_4 lnGDP_t+\varepsilon_{it}$
Model 2: $ROA_{it}=\alpha_0+\alpha_1 lnP2P_t+\alpha_2 lnTA_{it}+\alpha_3 NPLR_{it}+\alpha_4 lnGDP_t+\varepsilon_{it}$

where,

ROA is the profitability (ROA of the Ith bank in the period t)
lnTPP is the log of transaction volume of third-party internet payment
lnP2P is the log of transaction volume of P2P online lending
lnGDP is log of gross domestic product
lnTA is log of total assets of i banks
NPLR is non-performing loans ratio of i banks
i is number of all commercial banks
t is a year from 2008-2018
α is each variable coefficient
ε is a random error term

The two proxies for internet finance (TPP and P2P) were separated into two models as they are highly correlated with each other.

Empirical Results and Analysis

Based on the annual data of 16 commercial Banks from 2008 to 2018, this study conducts grouping regression to investigate the impact of internet finance on the overall profitability of commercial banks and different types of commercial banks respectively. EViews 12 is used to regress the investigated models. The results of model estimation and regression will be shown in this chapter.

Descriptive Analysis

Table 4: Statistical Descriptive Analysis

Variables	Min	Max	Mean for all	Std. Dev.	State-owned	Joint-stock
Dependent variable						
ROA	0.130	1.410	0.933	0.214	1.085	0.864
Independent variables						
lnTPP	5.614	12.300	8.980	2.162	n.a.	
lnP2P	-2.408	7.939	3.675	3.720		
Control variables						
lnTA	6.162	10.168	8.070	1.221	9.374	7.477
NPLR	0.100	4.320	1.256	0.586	1.504	1.144
lnGDP	10.372	11.408	10.937	0.327	n.a.	

It can be seen from Table 4 that the mean value of the overall average return ROA is 0.933, the minimum value is 0.130, and the maximum value is 1.41, indicating that there is a certain gap in profitability between different banks. Between the two types of banks, the ROA of the five state-owned banks with an average of 1.085 is higher than that of joint-stock banks with 0.864. This indicates that the profitability of the state-owned banks in China is significantly stronger than joint-stock banks, generating more profits.

From the perspective of independent variables, third-party internet payment and P2P online lending are large in scale, and they have certain advantages in the development of their business models, so the scale has been rapidly expanded since their emergence. The standard deviation of the P2P online lending is 3.72, with large fluctuations between the values. This is mainly due to the numerous regulatory policies and strict regulations issued since 2016, which have effectively restrained the occurrence of illegal fund-raising, runaway events and other disorderly events in the industry, and promoted the P2P industry to return to rational growth. From the bank-specific control variables, the asset size of the five state-owned banks is significantly larger than joint-stock banks, and the asset size of different banks varies greatly. The average non-performing loan ratio is 1.256, among which the average non-performing loan ratio of the state-owned banks and joint-stock is 1.504 and 1.144 respectively, indicating that the state-owned banks are worse in loan risk management than the joint-stock banks, and the amount of non-performing loans is relatively large. From the perspective of macro-control variables, GDP growth in China has not changed much, almost maintaining a high-speed growth. The standard deviations of NPLR, lnTA and lnGDP are 0.586, 1.221 and 0.327 respectively, indicating that the differences between the values of these variables are not too large and have small fluctuations.

Correlation Analysis

Table 5: Correlation Matrix of the Variables

	ROA	lnTPP	lnP2P	lnTA	NPLR	lnGDP
ROA	1.000					
lnTPP	-0.055	1.000				
lnP2P	0.047	0.966	1.000			
lnTA	0.555	0.412	0.417	1.000		
NPLR	-0.091	0.287	0.228	0.434	1.000	
lnGDP	0.026	0.784	0.785	0.419	0.210	1.000

Table 5 above shows that the correlation coefficients between ROA and third-party payment scale is -0.05457, showing a relatively obvious negative correlation. The transaction volume of third-party payment has a reverse relationship with total asset returns under other conditions unchanged. While the transaction volume of P2P online lending is positively correlated with ROA, indicating that they move in same direction. Additionally, the correlation between lnTPP and lnP2P is relatively strong, and the correlation coefficients are above 0.95. When we test multicollinearity issues in regression models, the problem can be viewed serious if the correlation coefficient between the two variables are higher than 0.8 (Gujarati, 2002). Therefore, to avoid serious multicollinearity problems in the model, they are separately regressed with the return on total assets.

Regression Results and Analysis

Model 1 – Bank profitability and TPP

Table 6: The Regression Results of Model 1 for Full Sample Banks

Variable	Coefficient
C	-15.974***
	(1.818)
lnTPP	-0.287***
	(0.029)
lnTA	0.128***
	(0.019)
NPLR	-0.008
	(0.023)
lnGDP	1.688***
	(0.192)
R square	0.519
Adj R square	0.508
F-statistic	46.214
Prob (F-statistic)	0.000
Durbin Watson stat	1.119
Est. tech	REM

Note: ***, ** and * indicate significance at the 1%, 5%, and 10% level respectively. Figures in parentheses ( ) are standard error.

Model 1 uses Random Effect Model (REM) under panel regression analysis. The regression coefficient of the third-party transaction (TPP) is -0.286702, and it has a negative relationship with the return on total assets (ROA) at the 1% significance level. The third-party payment and the profitability of commercial banks show a significant inverse relationship, supporting that hypothesis 1. The result is consistent with previous studies (Chen *et al.*, 2019; Zhu, 2019; Zhang, 2019). The results indicate that the when third-party transaction scale increases by 1%, it can cause the bank's total asset return to decrease 28.67%, that is, the expansion of the third-party transaction scale has a negative impact on the bank's profitability. The results of the panel data analysis are shown in Table 6.

Third-party payment platforms have squeezed the share of commercial banks' debt business and intermediate business, in terms of clearing and settlement and third-party financial management sales. In order to strengthen the management of payment and clearing business, the Central Bank of China has issued the provisions of the Customer Reserve Deposit Management Measures for Payment Institutions, which requires that all the customer reserve funds obtained by the third-party payment platform need to be paid to the account of the depository bank that cooperates with it, and become the bank's current deposit. The Central Bank also stipulates that it can deposit the relatively stable part of its reserve as fixed deposits. Since the interest rate of fixed deposits are higher than that of demand deposits, this led to an increase in the cost for the commercial banks. Therefore, third-party internet payment increases the cost of obtaining capital and reduces the interest income of commercial banks through the depository of provisions and other third-party business precipitation funds (Chen, 2018).

Model 2 – Bank profitability and P2P

Table 7: The Regression Result of Model 2 for the Full Sample

Variable	Coefficient
C	8.395***
	(2.195)
lnP2P	0.056***
	(0.018)
lnTA	0.163***
	(0.020)
NPLR	-0.148***
	(0.024)
lnGDP	0.805***
	(0.208)
R square	0.346
Adj R square	0.330
F-statistic	22.591
Prob (F-statistic)	0.000
Durbin Watson stat	0.979
Est. tech	REM

Note: ***, ** and * indicate significance at the 1%, 5%, and 10% level respectively. Figures in parentheses ( ) are standard error.

Model 2 uses REM under panel regression analysis. From Table 7, it can be seen that the regression coefficient show that P2P online lending has a positive impact on the profitability of commercial banks. This is in line with Cai (2017) and Han (2018). The increase in P2P online loan transaction volume leads to an increase in bank profitability. When P2P online loan transaction volume increases by 1%, it will bring about a 5.6% increase the bank's return on total assets. The result shows that the emergence of P2P does not divert much assets, liabilities and intermediary business from commercial banks but improves the performance of commercial banks. Han (2018) discusses the future development of P2P and commercial banks, and concluded that P2P and commercial banks will experience a stage of integration and then differentiation. It is unlikely that the P2P online lending will have a negative effect on commercial banks Although the internet financial loan platforms are more convenient and have lower threshold than that of traditional commercial banks, it possesses many drawbacks due to loose regulation. When the internet financing platform regulation was strengthened, many of the P2P providers with insufficient qualifications were forced to withdraw from operation. Their customers return to the bank, so it has a positive impact on the profitability of the bank.

In addition, the customers who are being targeted by banks and P2P online lending are not from the same market segment. The high-quality customers who meet the loan requirements of commercial banks will choose commercial banks with lower interest rates instead of P2P online lending platforms. Those who do not meet the loan requirements of commercial banks are usually those with higher default risk. This may, indirectly, help banks reduce the non-performing loan rate of commercial banks and improve banks' performance.

Additionally, the magnitude of the coefficient of Third-Party Payment (TPP) is greater than that of P2P (0.287 > 0.056). This shows that the third-party payment has a greater impact on commercial banks. Compared with the third-party payment, the P2P model has an imperfect system, higher risks, and lack of standardisation, which are likely to affect the way customers borrow. In terms of the absolute value of the coefficient, the estimated coefficient of the third-party internet payment is much bigger than that of the P2P online loan, that is, the third-party internet payment has the greater impact on overall profitability of commercial banks. From the two models above, we can observe that third-party payment (TPP) has much higher impact on the overall profitability of commercial banks. As internet finance encroaches on the traditional business of commercial banks, it weakens the profitability of commercial banks.

EMPIRICAL RESULTS AND ANALYSIS OF DIFFERENT COMMERCIAL BANKS BY TYPES

In order to observe whether internet finance has different effects on different types of banks, this study analyses the effect of the internet finance on a) state-owned commercial banks and b) joint-stock commercial banks via panel regression similar to models (1) and (2) for these two types of banks.

Results for State-owned Commercial Banks

Table 8: Regression Results of Model 1 and 2 for State-owned Banks

Variable	ROA (State-owned Banks)	
	Model 1 (P2P)	**Model 2 (TPP)**
C	-12.909***	10.652***
	(2.548)	(2.474)
lnTPP	-0.249***	n.a.
	(0.038)	
lnP2P	n.a.	0.061***
		(0.020)
lnTA	0.157**	0.136*
	(0.077)	(0.078)
NPLR	-0.037	-0.168***
	(0.029)	(0.026)
lnGDP	1.355***	-0.989***
	(0.268)	(0.244)
R squared	0.608	0.416
Adj R squared	0.577	0.370
F-statistic	19.383***	8.918***
Durbin Watson stat	1.715	1.858
Est. tech	REM	REM

Note: ***, ** and * indicate significance at the 1%, 5%, and 10% level respectively. Figures in parentheses ( ) are standard error.

Both models in Table 8 use REM under panel regression analysis. It can be seen from Table 8 that internet finance affects the profitability of state-owned banks. Third-Party Payment (TPP) has a negative effect on the profitability of state-owned banks, indicating that they move in inverse direction. This is also because the third-party internet payment has the most overlap with the business of commercial banks, which not only have an impact on the non-interest income of banks, but also to increases the cost of obtaining capital for banks which reduces the interest income. For every 1% increase in third-party payment, ROA decreases by 24.9% On the other hand, P2P online lending has a promoting effect on state-owned banks' profits. For every 1% increase in P2P online lending, ROA raises by 6.1%. In terms of the magnitude of the coefficients, the estimated coefficient of the Third-Party Payment (TPP) is greater than that of the P2P online lending, that is, the third-party internet payment has the greater impact on the state-owned banks compared to TPP.

Results for Joint-stock Commercial Banks

Table 9: Regression Results of Model 1 and 2 for Joint-stock Banks

Variable	ROA (Joint-stock Commercial Banks)	
	Model 1 (P2P)	Model 2 (TPP)
C	-16.717***	7.732***
	(2.421)	(2.815)
lnTPP	-0.295***	n.a.
	(0.039)	
lnP2P	n.a.	0.057**
		(0.024)
lnTA	0.126***	0.170***
	(0.035)	(0.036)
NPLR	-0.006	-0.175***
	(0.035)	(0.035)
lnGDP	1.764***	-0.745***
	(0.259)	(0.268)
R squared	0.471	0.284
Adj R squared	0.446	0.259
F-statistic	25.118***	11.485***

Durbin Watson stat	1.033	0.880
Est. tech	REM	REM

Note: ***, ** and * indicate significance at the 1%, 5%, and 10% level respectively. Figures in parentheses ( ) are standard error.

Both models in Table 9 use REM under panel regression analysis. It can be seen from Table 9 that there is an inverse relationship between profitability of joint-equity commercial banks and TPP. When transaction volume of third-party payment changes by 1%, the return on assets accordingly changes by 29.5% in the opposite direction. However, P2P online lending has a positive impact on commercial banks' profit. For every 1% increase in scale of P2P online lending, the ROA would increase by 5.7%. From the magnitude of the coefficients, it can be seen that the estimated coefficient third-party internet payment (TPP) is greater than that of the P2P online loan (P2P). This result is similar with that of the as the state-owned banks.

CONCLUSION AND RECOMMENDATIONS

Traditional financial institutions are affected by internet finance. Traditional finance managed to integrate the traditional financial industry with the internet technology. This has spawned many high-tech financial products and services, which have made people's lives more convenient. It has altered many people's ideas in investment and financial management. Internet finance has continuously reduced the original market share of the traditional financial business of commercial banks, which has affected their profits. This research studies the impact of internet finance on the profits of commercial banks.

This study discusses influence mechanism of internet finance on the commercial bank's business, and analyses its effects on the profitability of commercial banks from the two dimensions of internet wealth; Internet financing and internet payment businesses. It can be concluded that P2P online lending reduces the amount of bank loans by capturing the market share of the loan business of commercial banks, thus reducing the loan interest income and the profit margin of commercial banks. Internet finance reduces the intermediary business income by attracting deposits and preempting fee income away from the commercial banks. This decreases the profit margins for commercial banks. Hence, external internet financial companies have a negative impact on the profitability of traditional commercial banks to a certain extent.

In terms of the internet payment business, third-party payment has negative influence on overall profitability of commercial banks. While for the internet financing business, P2P online lending has a positive effect on commercial banks' profitability. These indicate that the development of internet finance has both positive and negative impacts on the revenue of traditional commercial banks. However, the third-party payment has a greater impact on banks' profitability in comparison to P2P online lending. It is mainly because P2P online loans and commercial banks serve different market groups. Third-Party internet Payment (TPP) has formed fierce competition with commercial banks in assets, liabilities and intermediary business, which has been reflected in the diversion of bank deposits, substitution of bank transactions, increase of interest payment costs, and reduction of intermediate business income.

When the analysis is broken into different types of banks, Third-Party Payment (TPP) is found to be negatively related with both state-owned and joint-stock commercial banks while P2P online lending exhibits a positive relationship with the two types of banks. Since state-owned banks and joint-stock banks are different in asset size, profitability efficiency, cost management, target customers, and risk control, the degree of shock they suffer from internet finance is different. Large state-owned banks, with huge assets, government and policy support, large and sticky customer base, and diversified profit channels, are less affected by internet finance. The profitability of state-owned banks with their unique advantages is generally greater than the joint-stock banks'.

Above all, the internet finance meets the personalised needs of different customers with its rich and diversified business forms, products and services. With the improvement of the relevant legal system and regulations, internet finance will gradually become stronger, and will have a substantial impact on traditional finance. Overall, commercial banks should actively respond to the impact of the internet finance development and turn it into opportunity. Commercial banks should make appropriate adjustments especially their operations to ensure satisfactory experience for their customers. It is necessary for the commercial banks to seize the opportunities from internet finance and strengthen cooperation with internet financial platforms, and finally achieve a win-win cooperation.

IMPLICATION OF THE STUDY AND SUGGESTION ON FUTURE STUDY

Commercial banks, as traditional financial institutions, occupy a dominant position in China's financial system. Profitability is the basis for the survival and sustainable development of commercial banks, and the sustained and healthy development of commercial banks can promote the stability of the financial market and the prosperity of the real economy. The existence of commercial banks is of great significance to the stability of China's entire financial system. Since internet finance emerges, it has posed a huge challenge to traditional financial institutions, especially commercial banks. Internet finance gradually captures part of the business of commercial banks through its own cost and information advantages. In spite of this, Internet finance is also an opportunity for commercial banks. Under the threat, commercial banks are compelled to actively take measures to reform and innovate to preserve their profitability and existence.

Commercial banks are important financial intermediaries for the economy and it is imperative that they ensure healthy and stable operation. The commercial banks in China are different in assets scale, property structure, and operating conditions. The impacts from the development of internet finance varies for different types of banks. The current study also conducts analysis for different types of banks and explores how much are they affected by internet finance. In general, this research provides basic guidance for commercial banks, regulatory agencies to fulfill their aims through planning, development and operations in light of the emergence of internet finance.

It is interesting if the impact of internet finance to be investigated further. Hence, for future study purposes, researchers can look into the impact that China's internet finance has on smaller financial institutions, such as development financial institutions and saving institutions. Furthermore, on a macro-level; a study on the impact of China's internet finance has on the country's economic growth is also warranted.

NOTES:

[1.] This mainly consists of P2P with large volume of transaction which emerged earlier, which have developed more maturely.
[2.] Proxied by the magnitude P2P (peer-to-peer lending) lending and third party payment.
[3.] Refer to Table 5 for the results of the correlation analysis.

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Digital Transformation Strategy: A Systematic Literature Review

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ABSTRACT

Digital transformation strategy has been an issue highlighted by many researchers and has become a topic of importance to be discussed. The purpose of this paper is to present the results of a review of 20 selected studies which include 14 different frameworks and models of different digital transformation strategies. The main focus of the study is on the frameworks and models in measuring digital transformation strategies. The findings indicate the measurements applied in digital transformation strategies vary between industries and organisations. The findings reveal that most existing frameworks and models provide incomplete illustrations of digital transformation strategies that very little research discussed on frameworks or models to measure digital transformation strategies. Thus, it is evident that research about digital transformation strategies needs more attention by researchers to explore in the future.

Keywords: *digital, digital transformation strategies, search, appraisal, synthesis, and analysis*

INTRODUCTION

Technological advancement has opened the door to the digital age all over the world and hunger for quick access to information that aims of meeting modern needs (Omar *et al.*, 2020). Many organisations have used emerging technologies to facilitate and improve their performance, services, and business transactions. It is also a cultural change that requires organisations to adapt with flexibility, efficiency, and responsiveness to improve the sustainability and maintainability of the organisation (Borangiu *et al.,* 2019; Faisal *et al*., 2019). For these reasons, organisations therefore need to adapt to digital transformations.

Digital transformation is a complex issue that affects many segments within an organisation (Hess, Benlian, *et al.*, 2016) but it becomes an important aspect for the organisation to improve processes, values, and competitiveness (Zineb & Bounabat, 2019). It is a phenomenon all over the world to engage in organisational activities to achieve excellence in operation and efficiency (Grab *et al.*, 2019). The goal is to value and prioritise customer experiences on new capabilities and functions of the organisations through the new application or technology (Saeed, 2020). It involves the organisations to start the transformational change by substantially integrating digital technology into their activities or transaction (Tekic & Koroteev, 2019).

As such, organisations need to adopt digital transformation strategies to be competitive and at the same time can offer added value to their customers (Kitsios & Mitroulis, 2019). However, despite the implementation of digital transformation in multi-sector namely business, government, education, health care, and private life, there is still a lack of digital transformation strategies. It is important to formulate and evaluate the digital transformation strategies even though it is not fully investigated, with immature literature and inadequate understanding (Kitsios & Mitroulis, 2019). Most literature in this field focused on the definitions, concepts, phases, and components of digital strategies but few studies provided an analytical review on the framework and models that could provide guidelines for digital transformation strategies. Therefore, it is suggested that both academicians and practitioners need to further investigate these issues on digital transformation strategies (Kitsios & Mitroulis, 2019).

The emphasis of this paper is to review, consolidate, and assess the various framework models on digital transformation strategies from various sectors. This study is based on the systematic literature review method in an attempt to give some insights into the latest thinking and developments on the topic in question and emphasizes the importance of digital transformation strategies to practical implementation. To formulate this study, the following questions emerge to frame the study:

1. How many studies have been conducted to explore digital transformation strategies?
2. What types of methodology did researchers use to explore the digital transformation strategies?
3. What are the attributes that contribute to digital transformation strategies?
4. What are the models or frameworks used as an approach to digital transformation strategies?

This paper is organised into four main sections. Section 1 introduces the digital transformation strategies literature. Section 2 describes the research process and approach. Section 3 presents the result of the systematic review, and finally, Section 4 provides the findings and suggestions for future research.

RELATED WORKS

Digital transformation strategy means to systematically address digital transformation by adopting the formation in the organisation (Chanias & Hess, 2016). It involves the functional or organisational strategies to coordinate with many independent drivers in supporting organisations' transformation (Bumann & Peter, 2019) and includes all organisation segments and characteristics to coordinate organisation activities and operations (Saeed, 2020). In this case, the digital transformation strategies can be successfully implemented with strong top management support (Tekic & Koroteev, 2019), and it should be driven by the top-down management to influence the adoption of the strategies (van Dyk & van Belle, 2019). Organisations need to have the knowledge and clear understanding of the digital structure requirements and the challenges to come of formulating a digital transformation strategy.

There are several studies carried out on digital transformation strategies on the development of framework models. Some of them are digital transformation framework Matt *et al.* (2015); Hess, Benlian, *et al.* (2016); Chanias *et al.* (2019); Wang *et al.* (2020); Ghosh *et al.* (2018); Hess, Matt, *et al.,* (2016); and Kitsios and Mitroulis, (2019), digital maturity model (Saeed, 2020), transformational affordance framework (Senyo *et al.*, 2021), exogenous and endogenous factors (Colli *et al.*, 2020), IT Governance (Zineb & Bounabat, 2020), digital strategies framework (Jin *et al.*, 2020), Integrated Methodological Framework Digital Strategy (IMDFS) (Zineb & Bounabat, 2019), typology digital (Tekic & Koroteev, 2019), digital transformation strategy star (Grab *et al.*, 2019), digital strategy implementation framework (Correani *et al.*, 2020), strategy building blocks (Setzke *et al.*, 2021), activity-based process model (Chanias & Hess, 2016), evaluation model (Güler & Büyüközkan, 2019), and theoretical framework (Zoppelletto *et al.*, 2020). Despite the studies that have been carried out, there are no specific guidelines and formulation for organisations to implement and evaluate their digital transformation strategies (Zineb & Bounabat, 2019) and both academicians and practitioners need to explore these issues further (Kitsios & Mitroulis, 2019). Therefore, more research needs to be conducted by the practitioners and academicians to enhance a clear understanding that leads to digital transformation including the causes of changes, the impacts, the processes, the requirements, and the challenges as the specific guidelines for organisations in framing their approach to digital transformation strategy.

Thus, it appears that there are lacking in the implementation of digital transformation strategies by holistic approach initiatives via a bottom-up process by top management (Chanias & Hess, 2016; Ghosh *et al.*, 2018; Dyk & Belle., 2019); established frameworks for the management to monitor the implementation (Zineb & Bounabat, 2019); companies maybe failed to extract value due to poor strategy formulation and strategy implementation (Correani *et al.*, 2020), limited studies to facilitates digital platformisation (Senyo *et al.*, 2021), and organisations need to assess and investigate their infrastructures in addressing current and future need for its digital transformation strategy (Saeed, 2020). In fact, in developing the digital transformation strategy the approach on its processes and activities must provide an in-depth understanding to affect its formation (Chanias & Hess, 2016). This raises ambiguity for the organisations regarding the holistic digital transformation approach to digitise and transform their businesses as to create new chances and opportunities to radically change and improve their business operations.

The above discussions on the literature suggest an agreement on the lack of specific guidelines for the organisations to build and monitor the digital transformation strategy (Zineb & Bounabat, 2019; Hess, Benlian, e*t al.*, 2016; Dyk & Belle., 2019); Vial (2019) and there is no holistic approach to it (Zineb & Bounabat, 2020; Chanias & Hess, 2016). It is indeed a complex phenomenon that is booming in the academic and practitioner communities and and therefore needs to be investigated (Tekic & Koroteev, 2019; Kitsios & Mitroulis, 2019). Based on this review, this paper was conducted to identify the works in the context of digital transformation strategy with the aim to provide further evidence on its conflicts and contributions that affirm the need for further research.

RESEARCH METHOD

This present study uses the systematic literature review based on SALSA framework which involves four main stages namely search, appraisal, synthesis, and analysis (SALSA) as illustrated in Figure 1. The methodology of SALSA dis determined by the searching protocol that enhances the accuracy, systematic, and reproducible (Grant & Booth, 2009; Mengist *et al.*, 2020; Siksnelyte *et al.*, 2021) and guarantees precision and completion (Grant & Booth, 2009; Mengist *et al.*, 2020). This approach minimises the publication bias and increases the acceptability of the works (Mengist *et al.*, 2020; Moher *et al.*, 2010).

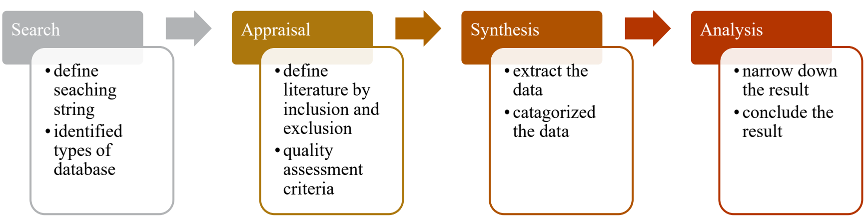

Figure 1: The Illustration of SALSA Stages (Source by Author)

To start the research, it is important for the researcher to define the scope of the study and identify the keywords to be used in the searching process. To start the search process, the databases were identified, and a literature search was carried out in Science Direct, Scopus, Emerald Insights, and Web of Science (WoS) databases. The search was performed by using the title, keywords, or abstract of these keywords: 'digital transformation strategy' or 'digital transformation strategies'.

In the appraisal step, the inclusion criteria of the articles are as follows: i) the paper should be written in English, ii) the articles must be subscribed journals, iii) the articles approach in digital transformation strategies, iv) the articles must be published between the year 2015-2021. Articles with the following criteria are excluded from the analysis: review articles; editorial letters; non-English articles, and articles which were not categorised as primary research.

The next step was synthesis where quality data was extracted and categorised to evaluate the rigor and credibility of the articles. The following criteria have been set for the articles:

i. Does the article discuss digital transformation strategies?
ii. Does the article have an adequate literature review?
iii. Does the article include the study on the framework or model of digital transformation strategies?
iv. Does the study valuable for research?
v. Does the article discuss adequately the research aims?
vi. Does the paper provide the limitations and future suggestions?

Based on the above questions, each of the articles will possibly; mentioned all the above, adequately mentioned, slightly mentioned, or not mentioned at all (only provide abstract) (Henriette *et al.*, 2015). Thus, it is important to analyse the articles to meet the quality score. Finally, the process involves the selection of articles to be analysed and followed by data extraction.

The results of the analyses were performed to select the qualified 20 articles with framework or models that were considered, processed, and analysed to study the factors that influenced digital transformation strategies. The illustration in Figure 2 illustrates the literature search, selection, and assessment processes of database searching.

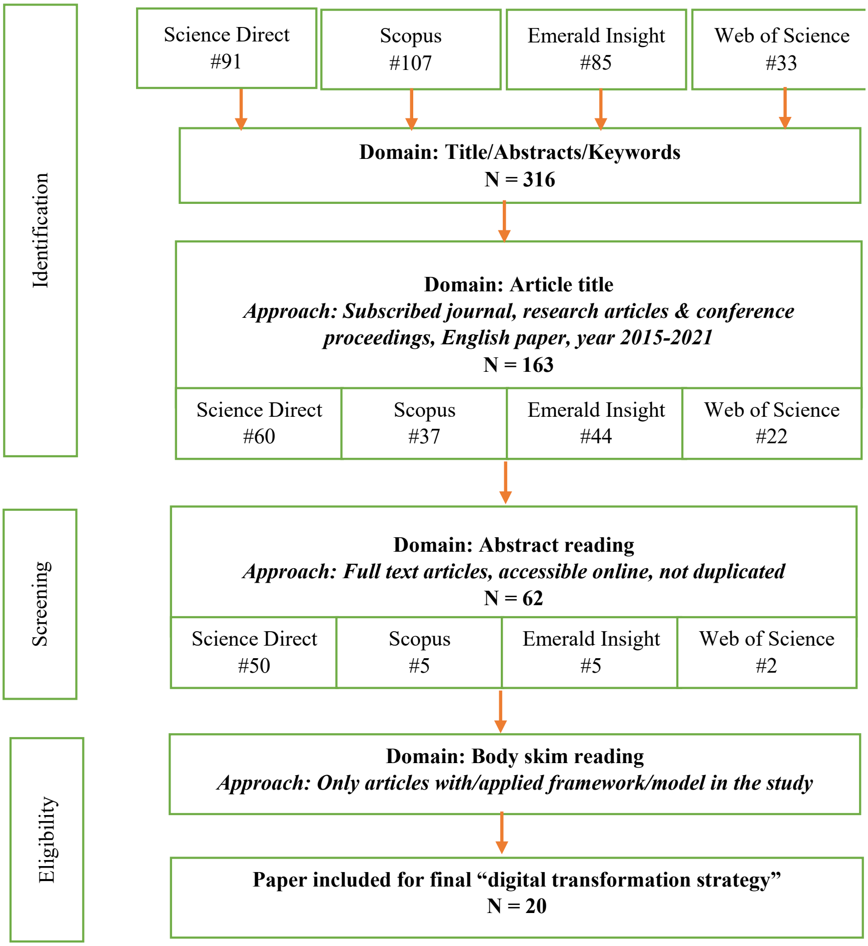

Figure 2: Process of Systematic Literature Reviews
Source: Modified from Mengist *et al.* (2020)

Thus, based on the above steps and characteristics that are determined in each of the processes, the articles have then been analysed to identify publications of articles by years, methodology used in the articles, the frameworks or models applied by the researchers, and the details on each of frameworks or models. The results are then shown in the next section.

RESULTS OF ANALYSIS

This section presents the overview of the findings of the analysis of the 20 selected articles on digital transformation strategies from various sectors.

Publication of Articles by Year

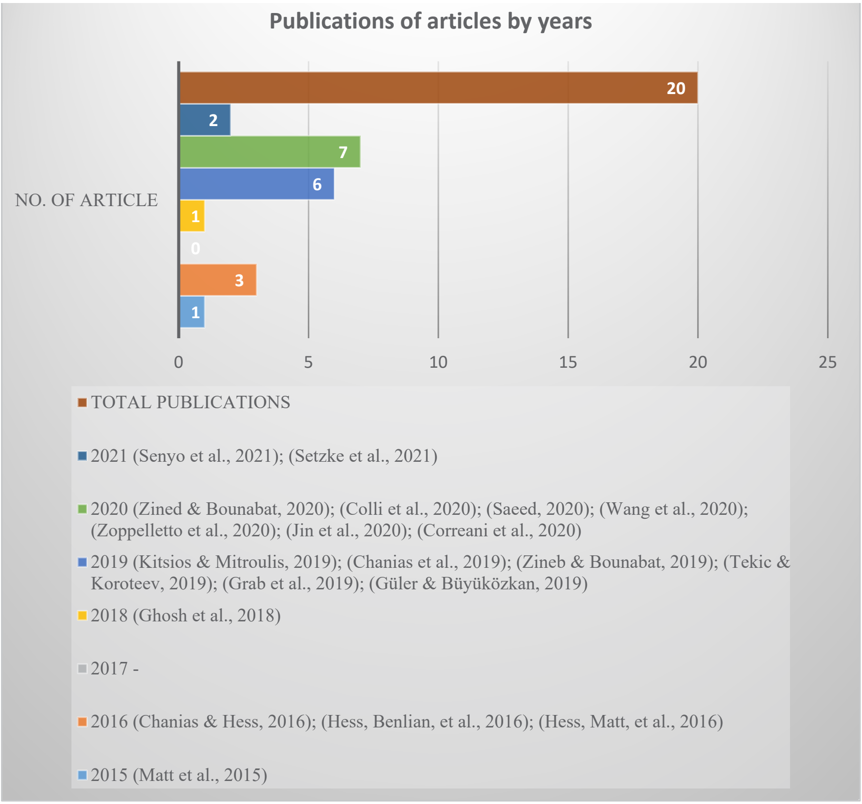

Figure 3: Publications of Articles by Years

Figure 3 indicates the number of articles in digital transformation strategies published from the year 2015 to 2021. With the specific keyword 'digital transformation strategy' the researchers finally ended up with 20 articles to analyse. Based on the content analysis of these selected articles it is evident that there was little attention to matters pertaining to digital transformation strategies in the past and therefore academic research seems scarce in this field. Even though the study in digital transformation strategy was published in 2015, there was only a minimal increase in numbers by 15% in 2016 with no study published in 2017 as the time of writing. Since 2019 and above, it was evident that academic studies began to bring attention to digital transformation strategies issues with the significant increase of about 65% of publications in 2019 and 2020. It is perhaps due to the Covid-19 pandemic that has pushed organisations and companies to respond quickly to digital transformation strategies in order to meet flexibility and efficiency in managing the pandemic (Jones *et al.*, 2021).

Publication of Articles by Methodology

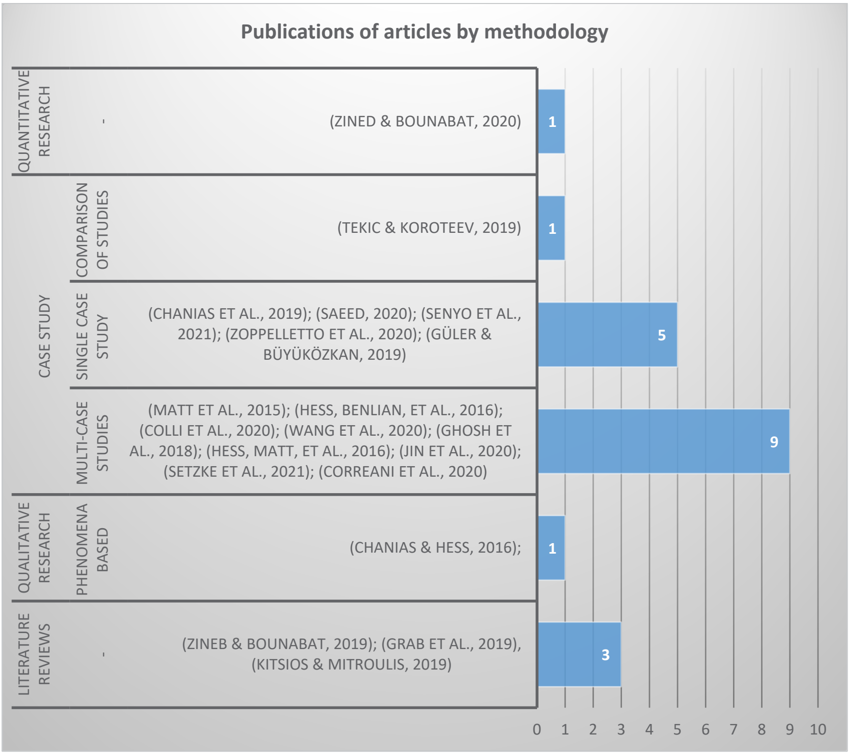

Figure 4: Publications of Articles by Methodology

Figure 4 presents the methodology performed by the researchers in their articles. Basically, the methodological pattern used by the researchers can be divided into four ways: quantitative research; case study (multi-case studies, single case study, and comparison of studies); qualitative research (phenomena based); and lastly literature reviews. From the above figure, it can be seen that the majority of the articles in digital transformation strategies used case study methods with (15 out of 20 papers) to explore the subject of their investigation by the following fractions; nine studies using multi-case study, five studies using a single case study, and one paper using comparison of study. The main reasons for the researchers to use the case study method were to collect insightful information (Colli *et al*., 2020; Hess, Benlian, *et al.*, 2016); to explore and analyse phenomena (Zoppelletto et al., 2020; Chanias & Hess, 2016); to gain reasons for adopting the actions (Hess, Benlian, *et al.,* 2016); and allowing in-depth study of strategy formation (Senyo *et al.*, 2021). From the Figure 4, three articles focused on conducting literature reviews. It is noticeable, only one study in the selected article adopted the quantitative method, and the rest of the articles were based on a literature review. However, it is highlighted by Zineb and Bounabat (2019) that digital transformation faces many challenges and it is still an ongoing area of research that leads this field to immature literature and inadequate understanding as a whole. Thus, it is important to investigate the formation of digital transformation strategies and develop well-designed frameworks or models for the initiation of a holistic digital transformation strategy (Chanias & Hess, 2016). The next sub-topic focuses on the contents of the framework or models applied or proposed by the researchers in each of the 20 selected articles.

The Frameworks or Models Applied by the Researchers

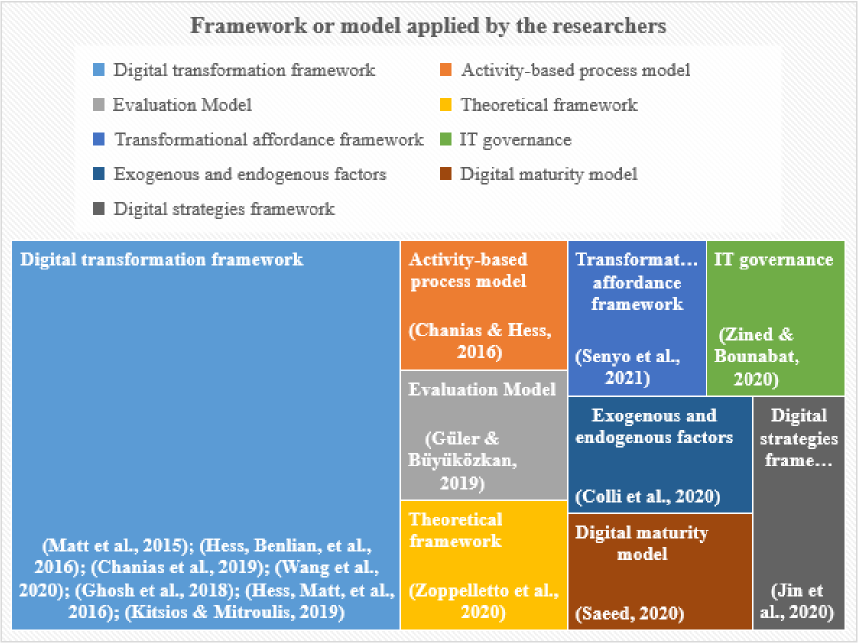

Figure 5: Framework or Model Applied by the Researchers

Figure 5 shows the frameworks and models used by the researchers in their research. It shows a significant number of the research using 'digital transformations framework' in their study (seven articles). The rest of the articles used different frameworks and models in their studies. However, there were no repetitive frameworks and models to measures the digital transformation strategies except for the 'digital transformation framework' which is repetitive by other researchers in measuring the digital transformation strategies. On the other hand, most of the researchers agreed that there are no rigorous frameworks and clear guidelines on digital transformation strategies (Korachi & Bounabat, 2019; Kitsios & Mitroulis, 2019; Matt *et al.*, 2015; Hess, Benlian, *et al.*, 2016; Hess, Matt, *et al.*, 2016; Setzke *et al.*, 2021; Correani *et al.*, 2020; Jin *et al.*, 2020; & Ghosh *et al.*, 2018). It is clearly highlighted that there were immature and scarce frameworks or models that can be referred to as guidelines in the development of digital transformation strategies. Zineb and Bounabat,

(2019) emphasized that there is no clear and thorough global model to describe the general concepts and guidelines to frame the efficacious digital transformation even though extensive research and assessment had been conducted. The next section highlights the contents of each framework or model.

The Details on Each Framework or Model

The details in Figures 6, 7, and 8 provide significant evidence that all identified frameworks and models in the selected 20 articles understudy pursued different dimensions and attributes in describing digital transformation strategies. The researcher has to separate the frameworks and models for a clear and better understanding to show all the different frameworks and models underlying different dimensions and attributes in each article. There are no consistent frameworks and models in describing the digital transformation strategies even though digital transformation frameworks or models have illustrated significant repetitive studies in various sectors but the content in each of the studies is often inconsistent. The details on each of the frameworks are illustrated and described below:

Digital Transformation Framework																								
Dimensions & Attributes		Attitude	Technology Competence	Infrastructure	IT providers	Transforming Products	Transforming Services	Knowledge	Communication	Transforming Transaction	Organization/Corporate	Processes	Digital services	Digital Products	Skills	Culture	Digital Competencies	Leaderships	Cost	Resources	Value/benefits	Customers	Competitors	Shareholders
References	Sectors	Use of technologies				Changes in value creation					Structural changes								Financial aspects			Changes in customer experience		
(Matt et al., 2015)	Business	/	/			/	/			/	/	/		/	/					/				
(Hess, Benlian, et al., 2016)	Media company/German	/	/	/		/	/	/		/	/	/	/	/	/			/	/		/			
(Chanias et al., 2019)	Financial services/Europe			/	/			/			/	/	/	/	/	/	/	/		/		/	/	/
(Wang et al., 2020)	Enterprises/China			/		/	/	/	/		/	/	/	/							/			
(Ghosh et al., 2018)	Healthcare/US & Canada	/	/			/	/				/	/			/		/		/					
(Hess, Matt, et al., 2016)	Business/US & UK	/	/	/		/	/	/		/	/	/	/	/	/			/	/		/			
(Kitsios & Mitroulis, 2019)	Systematic Literature Reviews	Develop a conceptual model with all 5 dimensions																						

Figure 6: Details on ‘Digital Transformation Framework’

The comparison of the digital transformation strategy framework (Figure 6) provides interesting findings. This figure synthesizes the data obtained based on the digital transformation strategy framework to explore the dimensions and attributes that employs in the framework. From the literature, it is clearly found that digital transformation frameworks consist of four dimensions namely i) use of technologies, ii) changes in value creation, iii) structural changes and iv) financial aspects. Remarkably, the findings show that this is the only framework that is relatively popular in the study of digital transformation strategies and has been repeatedly applied by many researchers to be studied in other fields (this has been compared through the mapping in Figures 7 and Figure 8). However, Kitsios and Mitroulis (2019) have proposed another dimension in their study i.e. v) changes in customer, only Chanias *et al.* (2019) has applied the dimension in their study among the 20 selected articles. Interestingly, the dimensions have been shed on different attributes and contents due in varied sectors and countries. It is stressed by Hess *et al.* (2016); Matt *et al.* (2015) as cited in Mariam *et al.* (2017) that there is still a lack of clarity about strategic digital transformation endeavors. Figure 7 and Figure 8 map the other framework or model in digital transformation that identifies the dimension and its sub-dimensions or attributes.

Model	Activity-based process model		
Reference	Chanias & Hess, 2016		
Sector	Automotive/Europe		
Dimensions and sub-dimensions:			
1. Triggering Event	**2. Strategy initiation**	**3. Deliberate strategy**	**4. Emergent Strategy**
▪ Competitors ▪ Digital offers ▪ Digital Services ▪ Culture	▪ Leadership ▪ Corporate strategy	▪ Transformation ▪ Digital initiatives ▪ Stakeholders ▪ Operational	▪ Financial ▪ Productions ▪ R&D
Model	Evaluation model		
Reference	Güler & Büyüközkan, 2019		
Sector	Banking		
Dimensions and sub-dimensions:			
1. People-centred strategy	**2. Value-based strategy**	**3. Collaboration and innovation strategy**	**4. Integration & alignment strategy**
▪ Customers ▪ People	▪ Organization ▪ Business Models	▪ Technology ▪ Culture	▪ Communication ▪ Ecosystem ▪ Strategies ▪ Capabilities ▪ Resources ▪ Management systems
Framework	Theoretical framework		
Reference	Zoppelletto et al., 2020		
Sector	Business network/Italy		
1. Participatory architecture	**2. Network-level organizational integration**	**3. Digital Tools**	**4. Sustains social responsibility**
▪ Cooperative Approach ▪ Digital Infrastructure ▪ Decision Process ▪ Learning Process ▪ Communication	▪ Adaptive ▪ Coordination ▪ Business activities ▪ Explicit Information ▪ Sharing Resources ▪ External Stakeholders	▪ Data Visualization	▪ Culture ▪ Social Responsibility

Figure 7: Details on 'Activity-Based Process Model', 'Evaluation Model', and 'Theoretical Framework' for Digital Transformation Strategies

Figure 7 identified different frameworks and models to approaches in describing digital transformation strategies namely activity-based process model, evaluation model, and theoretical framework. Each framework and model pursue different dimensions and sub-dimension in the related studies. Whereas Figure 8 shows multiple mapping of frameworks and models in describing the digital transformation strategies. It is also evidence that each of the frameworks and models in the related studies applied different attributes. This presentation provides significant evidence of immature and scarce digital transformation strategies frameworks and models across all studies in the 20 selected articles.

Model	Digital maturity model	**Attributes:** ▪ Strategy ▪ Leadership ▪ Operations ▪ Culture ▪ People ▪ Products ▪ Technology
Reference	(Saeed, 2020)	
Sector	Manufacturing/Arab Saudi	
Framework	Transformational affordance framework	**Attributes:** ▪ Process ▪ Efficiency ▪ Innovation ▪ Knowledge
Reference	(Senyo et al., 2021)	
Sector	Public Sector/Ghana	
Model	Exogenous & endogenous factors	**Attributes:** ▪ Strategy ▪ Technology ▪ Process ▪ Innovation ▪ Knowledge ▪ Financial ▪ Experts ▪ Resources ▪ Regulations ▪ Governance ▪ Competence ▪ Transformation
Reference	(Colli et al., 2020)	
Sector	Manufacturing/Europe	
Model/Framework	1. IT Governance 2. Integrated Methodological Framework Digital Strategy (IMDFS)	**Attributes:** ▪ IT Strategy ▪ Business Strategy ▪ IT Budgeting ▪ IT Organizational ▪ IT Steering Committee ▪ IT Reporting ▪ IT Investment Decisions ▪ IT Project Prioritization ▪ IT Reaction Capability ▪ Management Strategy
References	1. (Zined & Bounabat, 2020) 2. (Zined & Bounabat, 2019)	

Framework	Digital strategies framework	**Attributes:** ▪ Services ▪ Products ▪ Technology ▪ Process ▪ Value creation
Reference	(Jin et al., 2020)	
Sector	Industry/China	
Model	Typology digital	**Attributes:** ▪ Leadership ▪ Risks ▪ Transformation ▪ Skills
Reference	(Tekic & Koroteev, 2019)	
Model	Digital Transformation Strategy Star	**Attributes:** ▪ Operations ▪ Information ▪ Risks ▪ Employees ▪ Organization
Reference	(Grab et al., 2019)	
Framework	Digital strategy implementation framework	**Attributes:** ▪ Data Sources (internal/external) ▪ Data Platform ▪ Information ▪ Customers ▪ Partnerships ▪ People ▪ Artificial Intelligent ▪ Transformation ▪ Procedures ▪ Process ▪ Knowledge
Reference	(Correani et al., 2020)	
Sector	1. Electrical business/Switzerland 2. Agricultural equipment/Netherlands 3. Telecommunications/UK	
Model	Strategy building blocks	**Attributes:** ▪ Operations ▪ Information ▪ Risks ▪ Employees ▪ Organization
Reference	(Setzke et al., 2021)	
Sector	Business/Italy	**Attributes:** ▪ Leadership ▪ Partnerships ▪ Digital Business ▪ Services ▪ Innovation ▪ Threat

Figure 8: Variety of Frameworks and Models for a Digital Transformation Strategy

With regards to the presentation of the frameworks and models (Figure 6 to Figure 8), it depicts inconsistency of dimensions and attributes in describing the digital transformation strategies that can be found across all examined frameworks and models. Even though the analysis suggests there are guidelines to some extent, but they were often vague as there was lacking of standard approaches of describing digital transformation strategies even within the top domain (manufacturing and business). Mariam *et al.* (2017) highlighted that there is still a wide gap in the implementation of digital transformation that needs to the strategic and formulation to achieve the realisation of a successful digital transformation strategy. Therefore, the assessment to have an understanding and clear reference points need to be established to provide a clear map of potential guidelines of digital transformation strategies.

CONCLUSION

Digital transformation strategies are considered to be an issue in most industries and organisations due to the unclear development of frameworks and models to be referred to as guidelines to facilitate the implementation of the strategies. This paper is part of an academic reflection underway on digital transformation strategies to provide a better understanding of the field. It neatly constructs previous research works based on analysis of 20 selected articles by comparing digital transformation strategies frameworks and models.

Nonetheless, this research is limited by several factors such as the chosen keywords used to identify the articles under study. The research design only involved the search criteria using the limited terms of 'digital transformation strategy' or 'digital transformation strategies'. The research also focuses only on four databases (Science Direct, Scopus, Emerald Insight, Web of Science) to gain an initial understanding of the coverage offered by literature in various industries and organisations. In addition, the limitation of the analysis strategy in the present study is only based on several elements and aspects in the literature review process.

Conclusively, from the intensive systematic literature review methods of SALSA, it is found that most frameworks and models provide an incomplete picture, scarce, and inconsistent of digital transformation strategies across the selected 20 articles analysed. The findings indicate that the research in this domain with its dimensions is not sufficient and needs further investigation on the process of developing practical frameworks and digital transformation strategies. In addition, future research should focus more attention on 1) developing clear and consistent frameworks and models in digital transformation strategies, so that a holistic approach to framing the digital transformation strategies could be established, 2) frameworks and models should be explored in various sectors for comparative analysis, 3) clearly defined dimensions and their attributes should be developed to be integrated systematically in digital transformation strategies frameworks and models for possible implementation.

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ETHICS

The authors confirmed that this manuscript was originally developed by the writer and all references were cited and no ethical issues were involved.

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Project Finance Criteria and Governance of Public-Private Partnership Hydropower Project in Nepal

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ABSTRACT

Project finance arrangement has obvious need for contract management during its life cycle. Contract management for private sector hydropower projects generally include Generation License, Project Development Agreement, Power Purchase Agreement, Financing Agreement, Construction Contract Agreement, and Operation Contract Agreement. Markets, hierarchies and hybrids are the form of governance structure under the Transaction Cost Theory, while debt and equity often regarded as a basis for determining governance structure. Fundamental criteria for project finance arrangement include establishing a special purpose vehicle to undertake a project, using debt and equity in capital structure, debt capital obtained based on projected cash flow without collateral except if the project created assets given to the lender against the security of loan by the sponsors. This paper analysed project finance criteria as the determinants of governance structure in hydropower projects. In Nepal, private sector developed hydropower projects and supply generated energy to the only off-taker under Public-Private Partnership (PPP) and Project Finance (PF) *arrangement. The chi-square test was utilised to assess the association of fundamental criteria of PF with the governance structure of hydropower projects. The results indicate strong association between PF criteria with governance structure of sample hydropower projects in Nepal.*

Keywords: *governance, public-private partnership, project finance, hydropower, special purpose vehicle*

INTRODUCTION

Electricity is the primary source of energy and a sine qua non of development (Briscoe, 1999). There are various sources of electricity, and for many countries across the world hydro energy is an important source. Hydro electricity is important due to its zero-input cost, zero greenhouse gas emission, low operating and maintenance cost, and sustainability. Hydropower contributes seventy per cent to world renewable energy and seventeen per cent to global energy and it has highest potential of meeting domestic energy demand and export (Alam *et al*., 2017). Nepal has tremendous potential of hydropower but such potential is still untapped.

The World Bank has described basic financing mechanisms for infrastructure projects as (i) Government Funding, (ii) Corporate or On-Balance Sheet Finance and (iii) Project Finance or Off-Balance Sheet Finance. Infrastructure financing methods like public finance, corporate finance, Public-Private Partnership (PPP) and project finance are equally applicable in hydropower sector. Project finance is the most efficient financing arrangement for PPP project (WB, 2017). Although public finance remains the major source of financing for infrastructure projects, PPP and project finance method are applied in recent years. Since early 1980s realisation of limitation of public funding has been growing and project finance as a new tool gained importance which has evolved as a specific finance technique (Merna & Njiru, 2010). Adopting a long term concession agreement, PPP can also be form of the project finance for financing, developing and operating public services. For every model of financing, governance structure would be different. Governance is generally understood to be a system, a process or power of governing an organisation and denotes the group of people who command the functions of governing the organisation.

In large energy projects, a bank loan alone is not sufficient to finance project cost. But along with the public funding and private investment, bank loan plays significant role (Scannella, 2012). Key credit factors include transaction characteristics and security package (Lasa, Ahmad, & Takim, 2019). For attracting private investment in infrastructure, project finance has been proven to be a successful technique. Domestic institutional investors are the optimal anchor investor for any infrastructure project (Danso & Samuels, 2017). Investment structure of project finance involves debt capital from syndicate of banks and lending institutions and equity from sponsors of project (Eta, 2015). The concept of project financing is relatively new concept for Nepal, as collateral and personal guarantee-backed lending is mainly used. It is meaningless to ask for additional comfort in the form of properties (land and building) for any hydro project which in general is capital intensive project. Development of hydropower sector needs involvement of all stakeholders, the government, investors, financiers, local public, political parties etc. (Shah, 2008). Previous studies indicate project finance is important in infrastructure including hydropower project financing. Obviously, bank's involvement in project finance arrangement have influence on the governance structure of Project Company.

Recognising the importance of hydropower projects in Nepal and the significance of governance in project financing this study examines the effect of project finance criteria over the governance structure of the hydropower projects and relation of governance structure with project finance. This study also provides insights into the propensity of Independent Power Producers (IPPs) and Banking and Financial Institution (BFIs) towards project finance for hydropower development in Nepal. In the next section, background on hydropower projects in Nepal and literature review on governance structure and project finance is presented. The discussion on hypotheses development and research methodology precedes data analysis. Based on the responses received discussions on findings are presented to end study with conclusion.

HYDROPOWER PROJECTS IN NEPAL

Before the nineties, public finance was the sole source of finance for hydropower projects infrastructure. Nepal's first hydropower project, the Pharping (500kW) hydropower was constructed in 1911AD with support of the United Kingdom (Bhattarai, 2004). Until 1990 the government and government companies/undertakings were responsible for the development of the hydropower sector. By nature of the government organisation, the structure of project governance then was hierarchical and in line with government decision making processes.

In contrast to the traditional practice of hydropower development through government undertaking, currently Nepal hydropower sector is significantly undertaken by not only the domestic private players but by the international companies and governments. For instance, Pancheswor Hydropower Project, Arun III and Upper Karnali Hydropower Project are the projects with significant involvement of governments and foreign private developers. Pancheswor Hydropower is a bi-national project to develop in Mahakali River in Nepal and India with equal size of 3,240 MW capacity underground powerhouses each in Nepal and India. A vast area of agricultural land is to be irrigated with each country having separate project entity established under the integrated Mahakali treaty (GoN, 2020). On the other hand, GMR Upper Karnali Hydropower Project in western Nepal is a prestigious 900MW project which is under advanced stage of development and oriented to export the generated energy to Bangladesh and India. The project is being developed by GMR India through Nepal based subsidiary (GMR, 2020) . Similarly another 900MW project in eastern Nepal is under construction by another Indian company the Sutlej Vidyut Nigam through a subsidiary established in Nepal under the Nepal companies Act (SJVN, 2020). This project exports its generated power to India.

Private hydropower developers started financing hydropower sector after the new hydropower policy was issued (Shrestha, 2016). Before the government opened the hydropower sector for private investment, public finance remained the major source of finance for infrastructure projects. However, after the hydropower sector has opened for private sector investment with policy of promoting PPP in hydropower development, number of private companies registered with Office of the Company Registrar of Government of Nepal (OCR, GoN) has increased. There were 289 private companies in energy sector registered up to FY2073/74 (i.e.FY2016/17) with total committed fixed capital of NRs.678 billion. As of July 2019, there are altogether 83 hydropower companies as Independent Power Producers (IPPs) in operation with installed capacity of approximately 561MW, 120 under construction with financial closure IPPs project with installed capacity of approximately 2,614MW and 137 under construction without financial closure projects with installed capacity of approximately 2,869MW. Altogether there are 340 IPPs with 6,043MW installed capacity not including the above mentioned two export oriented projects. These IPPs are companies under the Nepal companies Act which was established after the Nepal Government introduced a policy to engage private sector in hydropower development.

The development of the hydropower sector of Nepal shows growing trend of increasing participation of private sector, international companies and international governments. This resulted in the introduction of new policies to govern the practice. The incorporation of new companies' and the effectiveness of project finance in infrastructure sector in general and hydropower sector further justify the scope and focus of this study.

PROJECT GOVERNANCE STRUCTURE

Governance Defined

The term'governance'is derived from the Latin word 'gubernare' meaning 'to steer', and the term has been frequently used in the literatures. Discussion on governance of projects has increased but its main origin remain ambiguous (Ahola, Ruuska, Artto, & Kujala, 2014). Contemporary governance is grounded in the philosophy of neo-liberalism where individuals are not 'steered' by their supervisors but by the subtle force in the society (Muller, 2016). Governance is about the performance of an agent in order to carry out wishes of his principal and not about the goal set by the principal, thus governance is about execution for better or worse (Fukuyama, 2013). 'Governance is the means by which to infuse order thereby to mitigate conflict and obtain mutual gains' (Williamson, 2014). Governance structure is a system or rule and can also be viewed as an institution. It is an institutional framework within which economic transactions are coordinated. It describes the parties involved in the transactions, helps to identify who owns what and who is allowed to make decisions (Spithoven, 2014).

Williamson (1998) with combined treatment of corporate finance and corporate governance said debt and equity are treated not only as alternative financial instrument but as alternative governance structure. Analysing the theory of firm and governance structure and explaining the relations with source of finance, Williamson (1998) mentioned 'board of directors is interpreted as a security for equity finance; debt and equity are not merely alternative mode of finance but are also mode of alternative governance'. He examined the organisation theory not from the lens of choice but with the lens of contracts (Williamson, 2002). Analysis with debt as a mechanism of governance suggested geographically dispersed banking syndicate as a strong form of governance in high risks countries (Dorobantu & Müllner, 2019). Comparative analysis showed project governance structure provides structured mechanism to manage risks (Guo, Chang-Richards, Wilkinson, & Li, 2014). An analysis of PPP from the lens of Transaction Cost Economics (TCE), suggests three major opportunism issues embedded in infrastructure PPP are related to principal-principal, firm's hold-up and government's hold up. These issues possibly cause high transaction cost and costly governance structure of PPP (Ping Ho, Levitt, Tsui, & Hsu, 2015).

Williamson (2014) named three modes of governance as market, hybrid and hierarchical under his examination relating to its strengths, weaknesses and alternative modes of governance. Market refers to arm's length transactions governed by contracts whereas hierarchical refers to internal organisation governed by unified ownership and internal control while hybrid refers mix of contracts of long-term and other similar arrangement with inter firm comparison (Ping Ho *et al*., 2015). PPP is a hybrid project finance structure where at least one public entity seeking to provide superior quality public services at lower cost is involved in a contract with at least one private company seeking new business opportunities with good profit. The most discouraging aspect of PPP for both public and private party is the risk of future opportunistic behaviour by the other party which may deter the promising transactions. Opportunism and bounded rationality can influence either of the parties resulting in their behaviour such as private parties lowering quality and investment and public party making more stringent regulatory provisions (Moszoro, 2013).

Economics of governance connects three fundamental concepts; adaptation, governance and the transaction cost (Williamson, 2014). In order to reduce the contractual hazards, economic importance of creating governance structure of individual transaction is emphasized (De Schepper, Haezendonck, & Dooms, 2015). While analysing organisation and economic activity, opportunistic behaviour has been studied (Klein *et al.*, 1978). After the transaction is in place opportunism is considered, and for maintaining the results and interest in the opportunistic behaviour, firms adopt governance structure (Jap & Anderson, 2005). The need of distinct organisational forms for infrastructure project implementation is highlighted in project finance. Such form has been seen in three distinct categories as market, hierarchy and trust. The ideal-typical form market of organisation relies on the price mechanism whereas the hierarchy and trust rely on authority and community respectively (Adler, 2001).

Governance Structure and Project Governance

Governance structure has been viewed as an organisational course of action for finishing specific series of transactions. It is normally classified into market governance, hierarchical governance, and hybrid governance. Market refers to the arm's length market exchange governed by contracts whereas hierarchical refers to the internal organisation governed by unified ownership and internal control. Hybrid governance refers to the blended control of transactions characterised by inter firm cooperation such as long-term contracts, alliances, and franchising. TCE maintains that transactions portrayed by certain dimensions of transactions ought to be lined up with different governance structures, varying in the cost and competence to create an economising result. Each specific governance mechanisms present different trade-offs between benefits and transaction costs. Choosing from alternative governance should be based on careful evaluation of the comparative costs and benefits (Parker & Hartley, 2003). Ho and Tsui (2009) analysed practice of PPP feasibility analysis considering the opportunism-based transaction cost of PPPs as governance structure (Ping Ho *et al.*, 2015). Institutional framework is important in project finance study in evaluating how well the project finance company has come to existence in terms of its different dimensions like separation from the sponsor/s, the lending terms including recourse provision, provisions relating to repayment and collateral.

If the governance system is working effectively, management of projects and programs can be effective. Systematic project failure is result of the failure of organisational governance. Significant roles are to be played by project sponsors for effective governance. They can support project governance in two broad perspectives i.e. an external focus and a more internal focus. External focus is about defining strategic matters from the view point of the client, whereas internal focus is to provide top management support from parent organisation and supporting project management by bridging governance function (Too & Weaver, 2014). Project governance provides a structured mechanism to address the risks (Guo *et al*., 2014). This approach in an infrastructure project offers a structured mechanism to analyse and address the risks including cost overrun, time overrun and delay as well as substandard construction works, ineffectiveness and low efficiency of infrastructure projects in developing countries. In order to assess the causes of the failure or success needs analysis (Khan, Hussain, Waris, Ismail, & Ilyas, 2018).

Project Governance structure selected for any project has significant impact on management of risks associated with the project (Guo *et al*., 2014). Under the project finance arrangement, the Special Purpose Vehicle (SPV) or Company or the project company enter several contracts with various parties. In the context of Asian markets bank financing in infrastructure PPP projects are still at infancy stage (Rao, 2018). Nepal is not an exception of this scenario.

Financing model adopted has direct impact over the governance structure of the project. If a project is developed and implanted as a government project its governance structure replicates the decision making process of the government departments. Similarly, in case a project is undertaken by Company, the process of decision making will follow the corporate decision making process. On the other hand, if the government and the private sector get involved in an infrastructure project under PPP-PF model, with a new project company, the SPV, its governance structure will have impact of the aspirations of various stakeholders including:

i. Project sponsors
ii. Government
iii. Off Taker
iv. Debt Holders
v. Community people at the project location and general public

The interest of the project stakeholders has direct impact on the governance structure of the project. In context of infrastructure projects including hydropower projects in project finance model, the effect of project finance criteria in determining the governance structure is the question for the investigation under this study. SPV is a tight governance structure in Project Finance using very high debt ratio. Thus SPV as a mode to projects implementation utilises high upfront investment cost and low operating cost (Steffen, 2018).

Project Finance

Project finance as defined by Gatti (2008), Nevitt and Fabozzi (2000), Tan (2007) and Yescombe (2002) is an arrangement where a SPV or a separate project company is created by project sponsors, with primary source of repayment of project loan being the cash flows of the project and the collateral represents only project assets. It is an arrangement with limited or non-recourse lending.

Project finance is also known as off-balance sheet investment where project itself should be strong enough to get lending from the institutional investors on the basis of the estimated cash flow of the project. As in the corporate finance model, the lender will not approve the loan based on the sponsor's financial position as the main criteria for providing the project loan. Habib and Johnsen (1999), Esty and Christov (2000) and Sawant (2010), mention the firms invest in specific assets through project finance because it mitigates the transaction cost arising from assets specificity. Asset specificity is present when transaction requires specialised investments which have small or no alternative value. Many researchers have highlighted the project finance and its relation with asset specificity and transaction cost quoting Williamson. Klein *et al.* (1978) developed the theory of special economic structure and governance with an entity with special purpose, called as SPV. The essential requirement of project finance arrangement is incorporation of an independent project company, SPV to undertake the project. Such SPV is provided with the equity by the sponsors and other participants and the debt capital by the lenders mostly by a syndicate of financial institutions. Such SPVs are usually dissolved after the completion of the project (Pietz, 2010).

Yescombe (2002), Merna and Njiru, (2010), Gatti (2008), Tan (2007), Nevitt and Fabozzi, (2000), Esty and Christov (2000) highlighted project finance as special arrangement for financing infrastructure project and mention that it has unique features including the followings:

i. Cash flow based financing
ii. Limited or non-recourse financing
iii. Project assets only as the collateral for project loan
iv. Establishment of a SPV

Strictly following the above criteria, the separation of governance for a hydropower project with a SPV, the lending terms including recourse provision and provisions relating to repayment, and collateral as intra-organisation or inter-organisational requirements are important aspects of the study in project finance and hydropower development in Nepal.

The structure of project finance transaction provides a governance framework which determines the type of business, scope of project operation and the type of potential business and a financial risk. The transaction structure must meet the minimum elements of project criteria that (i) the SPV is building and operating the project independently from its parent (ii) risk of repayment is restricted to the success or failure of the project (iii) the security package with first ranking security over substantially all of the assets and undertaking of the business for the project for the security of debt of the project finance debt holders (iv) covenant package extending over the terms of the debt for limiting additional debt, security, amendment to the structure including merger and acquisition and (v) covenant package for cash management establishing priority of cash payments after managing operation to debt holders or senior debt (Bariletti, Lutereau, D'Oliver, Selting, Kernan, 2014). Parent Linkage Analysis, Structural Protection Analysis and Additional Structural Elements are the basic three groups of analysis covered for project finance transaction structure rating (Michela *et. al*., 2014). Byoun and Xu in their analysis of Contracts, Governance and Country Risk in Project Finance, analysed the choice of PPP and Project Finance and concluded that country's political and financial risks have significant impact on PPP and Project Finance (Byoun & Xu, 2014). A snapshot of the review of literatures in relation to governance structure of a project finance arrangement is in Figure 1.

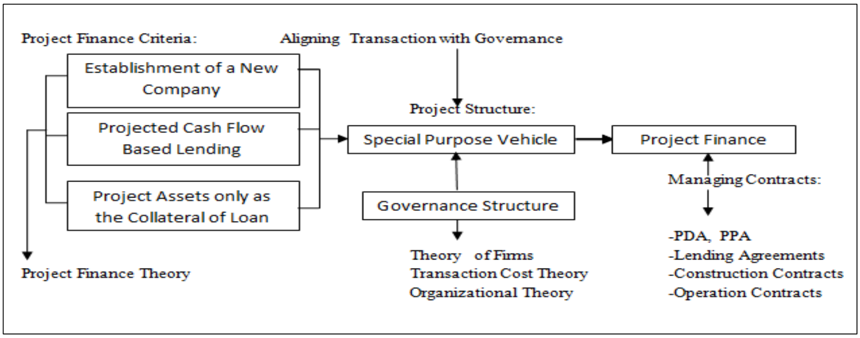

Figure 1: Project Finance Governance Structure

The literature review reveals many studies have been made in financing of energy projects and project finance in infrastructure sector. Studies in hydropower sector of Nepal also include a relatively large number of studies about financing hydropower project using PPP and PF mechanism. The following highlights indicate the gap in the past studies on project finance in hydropower development in Nepal.

SPV, a new company as project governance structure: After the opening of hydropower development to private sector, the emerging energy based companies in Nepal was simply understood as a requirement to obtain generation license. But it cannot be said that the hydropower project sponsors in Nepal are not aware of the basic criteria of project finance. Because SPV, the new company requires various contracts for example contract with the lenders, shareholders/sponsors, contractors, suppliers, and off-taker. In such a situation whether the sponsors are taking the SPV as a separate governance structure or it is just to obtain project development and generation license through solicited bids is an important gap to address.

Projected Cash-Flow based lending and governance structure: In project finance arrangement, lenders make investment in a project based on the viability of the project shown on project cash flow for at least during the loan period to make the project viable. Lenders may have conditions of unique separate governance structure of project in such investment.

Recourse provisions affecting governance structure: Project finance arrangement provides for non-recourse or limited recourse on the project assets only. Agreement between the lender and project sponsor can provide for a new separate governance structure to specifically secure the investment of the lender in the project.

Based on the gaps identified as mentioned above, basic framework of the study is conceptualised as shown in Figure 2. The association of PF criteria namely (i) incorporation of a new company (SPV) to undertake the project, (ii) lending to the SPV based on the project cash flow and (iii) limited or non-recourse finance, with project governance and the association of project governance with the hydropower projects have been analysed.

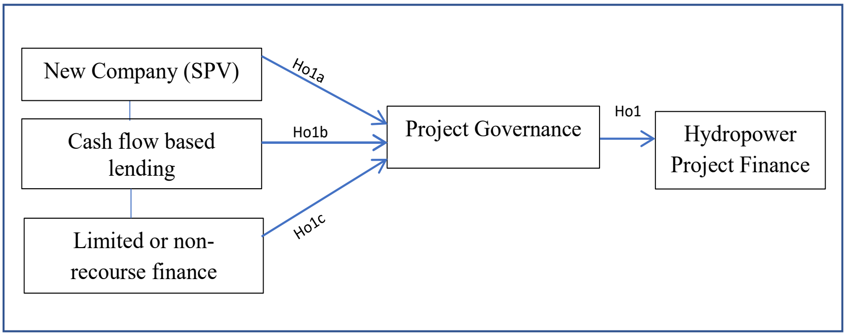

Figure 2: Research Framework

The following hypotheses were formulated:

H01= Governance structure of hydropower projects do not show the propensity of project sponsors towards project finance.

H01a= Incorporation of new company to undertake a hydropower project does not indicate sponsors propensity to governance structure of the project as per Project Finance model.

H01b= Lending based on projected cash flow is not significant in determining governance structure of hydropower project.

H01c= Limited or non-recourse finance is not significant in determining governance structure of hydropower projects.

METHODOLOGY

In the field of social science, the research design most commonly used is the survey method whereby information is gathered from the part of the total population. There are certain important criteria on why survey design is wise choice of design. Vogt, Gardner and Haeffele (2012) suggested the criteria for the application of survey method which is applicable is this study; (i) the data are best obtained directly from the respondents; (ii) the data can be obtained by brief answers to structured questions; (iii) respondents are expected to give reliable information; (iv) the use of the answers are known; and (v) an adequate response rate can be expected. The project finance arrangement for hydropower projects in Nepal is significantly affected by the inclination of the hydropower entrepreneur to the project finance arrangement and the willingness on the part of the BFIs to invest on limited or non-recourse basis. Institutional inclination towards some specific phenomenon is the result of the professionals working for the institution. As such the survey questionnaires is seen as an appropriate data collection method for this study.

The aim of this study is to conduct empirical examination of the effect of project finance criteria in governance structure of hydropower projects in Nepal. Descriptive and analytical design has been adopted to analyse the association of factors (project finance criteria) in governance structure of hydropower projects. For this purpose, cross-sectional data has been collected from the respondents representing IPPs, BFIs, Insurance Companies and other institutional investors like Employee Provident Fund and Citizen Investment Trust. Selection of respondents is made applying purposive sampling.

The sample of this study is determined through stratified sampling whereby samples were taken from each of group or strata in the population (Pant, 2016). As per Mid-July 2019 total population is 310. In order to determine the total number of sample the following formula was applied:

$$n=\frac{N}{1+N(e)^2}$$

Where,

n = Sample size

N = Population

e = desired level of precision. The level of precision in this study is at 7%.

Replacing the value in the above formula, sample size will be:

$$\frac{310}{1+310(0.07)^2}$$

$$= \quad 125$$

Treating the above mentioned group of respondent as individual strata, the total number of samples as mentioned by Kothari and Garg (2019) will be distributed as follows:

$$n_1 = n(P_1)/N$$

Where,
n_1, n_2 = samples from individual strata
n = total number of sample
P_1, P_2 = population of the strata
N = population

Using the above formula numbers of sample to be selected from each of the above group of respondents is shown in Table 1:

Table 1: Determination of Sample

Group	Population	Sample
Hydropower Companies	211	85
Commercial Banks:	28	11
Development Banks	29	10
Retirement Funds:	2	2
Life Insurance Companies	19	7
Non-life insurance Companies	20	8
Reinsurance Companies	1	1
Total	310	125

Google form questionnaires were distributed to 125 institutions representing the sectors mentioned above. Altogether 44 organisations participated in the survey. Out of the total 44 responses considered for this analysis 40 institutions responded through the on-line form and four responses were collected physically from the responding institutions amidst series of follow ups made to all the targeted respondents.

The detail of responses received under the questionnaire survey is presented in Table 2. Altogether 44 participants responded the survey. Of the total, 28 respondents, which are 63.6 per cent are from IPPs (hydropower companies). Similarly, nine responses which is 20.5 per cent including institutional investors and professionals; five responses which is 11.4 per cent are from BFIs (commercial and development banks); two responses which is 4.5 per cent is from insurance companies.

Table 2: Respondents

Organisations	Frequency (N)	Percentage (%)
IPPs	28	63.6
BFIs	5	11.4
Insurance Companies	2	4.5
Others including Institutional Investors	9	20.5
Total	44	100.0

Note: IPPs=Independent Power Producers, BFIs=Banking and Financial Institutions.

Based on Kothari and Garg (2019), the Chi-square test was performed to evaluate whether or not there is association between project finance criteria and governance structure of hydropower projects. The Chi-square test has been applied using SPSS to analyse and describe the data for the stated purpose of the study. The respondents were asked to indicate their level of agreement on statements covering (i) requirement of a unique governance structure for project finance (ii) establishment of new hydropower company and its motive to provide unique project governance structure, (ii) unique project governance structure to obtain cash flow based project loan and (iii) unique governance structure for non-recourse finance and (v) appropriateness of project finance model for development of hydropower sector of Nepal. The 5-point Likert-Scale (5 for strongly agree and 1 for strongly disagree) is used. The details of the responses received in 5-point scale is shown in Table 3.

Table 3: Frequency Table of Responses on 5-point Likert Scale Questionnaire

Variables	Response	Frequency	Percent	Valid Percent
New Company (SPV) as the Unique Governance Structure for PF	Strongly Disagree	6	13.6	13.6
	Disagree	4	9.1	9.1
	Neutral	7	15.9	15.9
	Agree	16	36.4	36.4
	Strongly Agree	11	25	25
	Missing	0	0	0
	Total	44	100	100
Separate Governance Structure and Loan based on Cash Flow	Strongly Disagree	6	13.6	14.0
	Disagree	7	15.9	16.3
	Neutral	4	9.1	9.3
	Agree	22	50	51.2
	Strongly Agree	4	9.1	9.3
	Missing	1	2.3	
	Total	44	100	100
Separate Governance Structure and Limited or non-recourse finance	Strongly Disagree	5	11.4	11.4
	Disagree	5	11.4	11.4
	Neutral	6	13.6	13.6
	Agree	19	43.2	43.2
	Strongly Agree	9	20.5	20.5
	Missing	0	0	0
	Total	44	100	100
Establishment of SPV as a separate governance structure for Project Finance	Strongly Disagree	6	13.6	13.6
	Disagree	8	18.2	18.2
	Neutral	5	11.4	11.4
	Agree	16	36.4	36.4
	Strongly Agree	9	20.5	20.5
	Missing	0	0	0
	Total	44	100	100

Project Finance	Strongly Disagree	4	9.1	9.1
	Disagree	3	6.8	6.8
	Neutral	5	11.4	11.4
	Agree	22	55	55
	Strongly Agree	10	22.7	22.7
	Missing	0	0	0
	Total	44	100	100

The instrument has been verified and validated with opinion of industry experts, and a pilot study. The reliability of the data has been accepted with Cronbach's Alpha of 0.721. As the analysis of 5-point Likert scale data resulted with more than 20 per cent of expected count less than 5, the data were recoded into two variables (i) Agree and (ii) Disagree with transform option available in the SPSS in order to apply Fishers Exact Test. The detail of the corresponding responses after recoding the 5x5 table into 2x2 contingency table has been depicted in Table 4.

Table 4: Corresponding Reponses After Recoded into 2x2

Variables	Response	Frequency	Percent	Valid Percent
New Company (SPV) as the Unique Governance Structure for PF	Agree	17	38.6	38.6
	Disagree	27	61.4	61.4
	Missing	0	0	0
	Total	44	100	100
Separate Governance Structure and Loan based on Cash Flow	Agree	17	38.6	39.5
	Disagree	26	59.1	60.5
	Missing	1	2.3	0
	Total	44	97.7	100
Separate Governance Structure and Limited or non-recourse finance	Agree	16	38.4	38.4
	Disagree	28	63.6	63.6
	Missing	0	0	0
	Total	44	100	100
Establishment of SPV as a separate governance structure for Project Finance	Disagree	19	43.2	43.2
	Agree	25	56.8	56.8
	Missing	0	0	0
	Total	44	100	100

Project Finance	Disagree	12	27.3	27.3
	Agree	32	72.7	72.7
	Missing	0	0	0
	Total	44	100	100

Governance Structure of the hydropower projects have been treated as the mediating variable for the study. The main project finance criteria, (i) establishment of a new company, SPV, (ii) lending based on project cash flow and (iii) the limited or non-recourse provisions have been taken as the independent variable. At first the effect of individual criteria on the governance structure of the project has been analysed. Secondly, the association of governance structure with project finance in hydropower projects has been analysed. Accordingly, the association between the variables has been tested using the Chi-square test.

FINDINGS AND DISCUSSION

Effects of Project Finance Criteria in Governance Structure:

Administration of PPP projects is challenging because the governance of PPP involves unique relationship between public and private parties and the complex financing issues (Ho & Tsui, 2009). TCE suggests different governance structure can be recognised for projects. PPP feasibility is viewed from the opportunism based transaction cost as well. This opportunism causes high transaction cost and costly governance structure. To avoid a risk of contaminating the sponsors existing business by potential failure of a new venture, sponsors may choose for a unique governance structure for a project. In order to mitigate transaction costs arising from assets specificity, firms choose project finance arrangement. As the SPV is created for specific project and usually dissolved after the completion of the project, such unique feature obviously demands different governance structure. This relates with the alternative form of market, hierarchies and hybrids of the governance structure as said by Williamson (2002). Ping Ho *et al*. mentions PPP, a costly governance structure involves three type of opportunism based problems principle-principle problem, firm's hold up problem and government led hold up problem giving rise to substantial transaction costs (Ping Ho *et al.*, 2015). Klein *et al.* (1978), Habib and Johnsen (1999), Esty and Christov (2000) and Sawant (2010), Pietz (2010), Steffen (2018) highlighted the uniqueness of SPV, a new company for the PF arrangement. In these conceptual frameworks, the incorporation of new companies in Nepal's hydropower sector and the effect on project governance has been analysed with formulating following hypothesis.

H01a= Incorporation of new company to undertake a hydropower project does not indicate sponsors propensity to governance structure of the project as per Project Finance model.

Currently hydropower projects in Nepal are mostly PPP projects. Most of the projects are governed under new companies incorporated after the hydropower sector was opened to private sector. The incorporation of new companies is phenomena similar to one of the criteria of project finance i.e. establishment of SPV to run the project. The motive of this study is to investigate into propensity of sponsors to project finance while establishing such companies.

Respondents were asked to express their opinion on whether the SPV is a compulsory requirement for project finance in hydropower projects. Another question about need of unique governance structure for project was given to obtain opinions from respondents. With cross tabulation of the responses for these questions, the test is significant with p-value falling within the alpha (α) of 0.05 taken for this study. As the null hypothesis has been rejected, the establishment of new companies in hydropower sector indicates sponsors propensity toward project finance. Thus the general grievance to private sector about the growing number of new companies to merely obtain hydropower generation license alone is not correct because project sponsors are aware of the requirement of project finance arrangement. It is the hydropower entrepreneur's opportunistic behaviour to utilise the PPP policy adopted by the government with a motive of business diversification accepting to manage complex relationship with public sector along the complex governance structure of PPP bearing substantial transaction cost. Choosing of alternative governance structure as Parker and Hartley (2003) described is critically rest upon the careful comparative analysis of costs and benefits.

Table 5: $H_0$1a Coefficient Value of Person's Chi-square and Fisher's Exact Test

	Value	Degree of Freedom	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5.231[a]	1	.022		
Continuity Correction[b]	3.899	1	.048		
Likelihood Ratio	5.286	1	.021		
Fisher's Exact Test				.031	.024
Linear-by-Linear Association	5.112	1	.024		
N of Valid Cases		44			

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.34.
b. Computed only for a 2x2 table

$H_0$1b=Lending based on projected cash flow is not significant in determining governance structure of hydropower project.

In balance sheet finance lending is based on the financial strength of the borrower. Lenders are primarily concerned on the sponsor's financial strength as assessed to be continued over the life of the loan rather than a specific economic activity. However, where financing is based on the financial viability of specific economic activity, the lender is highly concerned with the governance related to the economic activity rather than the sponsor's overall financial strength of now and of the future as long as the whole of the loan is repaid. In such a situation lender or syndicate of lenders in a syndicate finance put stringent conditions through various covenants which significantly influence the governance structure.

Questionnaire required the respondents to express their opinion in relation between the governance structure of the project and cash flow based lending providing unique governance structure required for project finance arrangement. With cross tabulation of the responses for these questions, the test is significant with p-value falling within the alpha (α) of 0.05. The output of the analysis is shown in Table 6 for $H_0$1b which indicates rejection of null hypothesis with p-value of 0.001 both in Pearson's Chi-square and Fisher's Exact Test. In huge capital intensive project institutional investors look into the bankability in term of sufficient cash flow for repayment instead of financial strength of project sponsors in case of corporate or balance sheet finance. Merna and Njiru (2010), Gatti (2008), Yescombe (2002), Tan (2007), Nevitt and Fabozzi (2000), Esty and Christov (2000) highlight the cash flow based lending as one the unique feature of the PF arrangement. Analysis by Michela *et. al.* (2014) and Byoun and Xu (2014) is critically related to the project cash flow and covenants of the financing agreement that have significant influence in the governance structure.

Table 6: $H_0$1b Coefficient Value of Person's Chi-Square and Fisher's Exact Test

	Value	Degree of Freedom	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	11.882[a]	1	.001		
Continuity Correction[b]	9.816	1	.002		
Likelihood Ratio	12.387	1	.000		
Fisher's Exact Test				.001	.001
Linear-by-Linear Association	11.606	1	.001		
N of Valid Cases	43				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.51.
b. Computed only for a 2x2 table

H01c=Limited or non-recourse finance is not significant in determining governance structure of hydropower projects.

As per Williamson (2014), debt and equity are not merely modes of finance but an alternative governance structure. Board of Directors are security for equity finance. But wherever the debt finance is significant in specific assets then the governance structure is influenced by debt financing. PF is limited or non-recourse finance. All of the authors including Merna and Njiru, (2010), Gatti (2008), Yescombe (2002), Tan (2007), Nevitt and

Fabozzi, (2000), Esty and Christov (2000) mention limited or non-recourse as one of the basic features of PF. By nature of this arrangement lenders try their best to influence the governance of the project by putting certain covenants on financing which has direct impact on the governance.

To test this hypothesis question with regards to requirement of separate project governance structure as an essential requirement for limited or non-recourse loan for the hydropower project in Nepal was asked to the respondents. The association of the responses on questions pertaining to requirement of unique governance structure and recourse provision has been analysed and the output as shown in $H_0$1c of Table 7 suggests rejection of null hypothesis with *p*-value less than the acceptable value of alpha 0.05 as mentioned above. This indicates that there is significant impact of recourse provision of the financing agreement on the governance structure of hydropower projects.

Table 7: $H_0$1c Coefficient Value of Person's Chi-square and Fisher's Exact Test

	Value	Degree of Freedom	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	6.699[a]	1	.010		
Continuity Correction[b]	5.162	1	.023		
Likelihood Ratio	6.798	1	.009		
Fisher's Exact Test				.013	.011
Linear-by-Linear Association	6.547	1	.011		
N of Valid Cases	44				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.91.
b. Computed only for a 2x2 table

Propensity of Project Sponsor to Project Finance in Hydropower Projects

The choice between corporate finance and project finance is of the sponsors. Theory prescribes specific criteria for PF arrangement for any infrastructure project. In project finance debt financing is obtained through the SPV, a new company. No assets of sponsors other than the project are given as the collateral. Financing is based on the financial viability of the project rather than the sponsor's financial strengths reflected by the balance sheet. This gives the lenders an opportunity to significantly influence governance structure of the PF entity. Governance structure of projects with PPP-PF model is influenced by the PF criteria analysed above. This has been confirmed by the above test. Governance structure has been treated as a mediating variable between the PF criteria and Project Finance in the hydropower sector.

Review of literature reveals two views on project governance structure. The first is project governance structure unique to the specified project which is independent from other projects. Another view is, in addition to project management discourse, to view project governance structure from transaction cost economics (Ahola *et al.*, 2014). Important factor emphasised in the finding of Ahola *et al.* (2014) is when the governance is taken as independent to any specific project the focus is intra-organisational. While dealing with project, several organisations get involved but the governance challenge is inter-organisational (Ahola *et al.*, 2014). A uniform way of privatisation can be disagreed upon but with respect to the transactions (as per TCE) different governance structure can be recognised for project investment negotiation agreement between Multi-National Enterprise (MNE) and host government (Jiang, Peng, Yang, & Mutlu, 2015).

In this study, to test the association of the governance structure with PF in hydro power sector specific question about appropriateness of PF model for development of hydropower sector of Nepal was given to the respondents. Responses on this question and responses on the questions relating to unique governance structure requirement have been cross tabulated to determine the association. The questions asked in the survey were individually and collectively intended to investigate into the association between governance structure and PF in hydropower project in Nepal to determine the propensity of hydropower project sponsors towards PF arrangement. As mentioned above following hypothesis has been set for analysis:

H01= Governance structure of hydropower projects do not show the propensity of project sponsors towards project finance.

As per the results shown for H01 in Table 8, the coefficient value of Person's Chi-square and Fisher's Exact Test is significant with *p*-value comparing with the alpha value of 0.05. With these indicators the above null hypothesis is rejected. Hence, there is propensity of project sponsors towards project finance in hydropower projects in Nepal. Moving forward with the results we can say that theory of opportunistic behaviour is significant. Private entrepreneurs are entering into the hydropower sector as the state owned entity is the off taker of the energy produced. Rejection of the null hypothesis suggests that new companies incorporated are the SPVs as per the PF criteria hence; these are not incorporated merely to obtain the power generation license after of PPP policy in hydropower development is adopted by the Government of Nepal.

Table 8: $H_0 1$ coefficient value of Person's Chi-square and Fisher's Exact Test

	Value	Degree of Freedom	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	10.842[a]	1	.001		
Continuity Correction[b]	8.708	1	.003		
Likelihood Ratio	11.338	1	.001		
Fisher's Exact Test				.002	.001
Linear-by-Linear Association	10.595	1	.001		
N of Valid Cases	44				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.18.
b. Computed only for a 2x2 table

CONCLUSION

Project Finance has much larger importance in renewable energy projects (Steffen, 2018) and is a typical project governance structure (Kripa & Xhafa 2013). This study found that BFIs, pension and retirement funds and institutional investors have significant influence on the governance of the hydropower projects, while laws relating to PPP, security transactions and government policy on hydropower have influence on the governance. Similarly, contractual provisions like lenders requiring periodical reporting on financial and physical achievement, lending institution represented in the board of directors of the project company, loan covenant for restricting the use of cash ensuring repayment of loan and covenants pertaining to additional loan have significant influence on the governance. These are consequential to various agreement entered into by the Project Company. Management of different contracts along the life cycle of projects are indispensable in project finance arrangement. Contracts necessarily to be managed in private sector hydropower projects generally include Generation License, and agreements on project development, financing, construction contract, and operation contract.

Motive of incorporating SPV for undertaking a project under project finance arrangement is to obtain loan to the SPV based on the project cash flow without any collateral except if the project created assets given as the security of loan from the sponsor to the lender. This study found hydropower project companies manage several contracts within its corporate governance structure. Many domestic as well as foreign project sponsors are involved in tapping the hydropower potential in Nepal. Similarly, domestic as well as international financial institutios are emerging as important players in hydropower sector in contrast to the situation of public sector as the sole source of infrastructure finance in the past. It has been found that these project companies are organisations that implement the specific project under the PPP framework adopted by the government and these companies significantly fulfil the project finance criteria.

This study analyses the effect of PF criteria in governance structure of hydropower companies in Nepal. Attempt has been made to relate the theories pertaining to governance and project finance. Being contextual with the study, reference of transaction cost theory has also been considered.

However, this study has not been involved into every aspect of TCE and its impact over the governance of hydropower project is Nepal, which is beyond the scope, hence the limitation of the study. The results of the test conducted show that there is significant effect of PF criteria on governance structure of hydropower projects in Nepal and the governance structure confirms the propensity of projects sponsors toward project finance. Domestic as well as foreign project sponsors are involved in tapping the hydropower potential of Nepal. Similarly, domestic BFIs and foreign institutional investors are emerging as the significant player in the hydropower sector whereas in history government was only the sole source of finance and development of the hydropower sector.

Future studies should include interviews with representatives from hydropower companies, government agencies, and banking sector. The emerging private institutional investors are expected to continue to significant influence the governance of the projects undertaken by the private project sponsors. To mention few of the facts which substantiate such effect (i) lenders requiring periodical reporting on financial and physical achievement (ii) lending institution represented in the board of directors of the project company, (iii) loan covenant for restricting the use of cash ensuring repayment of loan, (iv) covenants pertaining to additional loan and (v) impact of political and financial risks has impact on PPP-Project Finance arrangement and its governance structure should be taken into consideration in future studies.

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Understanding the Potentials and Challenges of Agricultural Technology Based Crowdfunding in Malaysia

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ABSTRACT

Crowdfunding is a new era financing alternative. It has been well accepted worldwide and the sustainability was empirically proven. Despite the popularity, rapid growth, and overwhelming acceptability worldwide, yet still to be unfamiliar relatively to many people. Especially in the Malaysian context where there is very little understand about how, why, where, when and what type of crowdfunding (business area) users prefer to engage. Accordingly, agriculture is yet to be among the Malaysian main industries since post-independence. However, as reported for the past couple of years, the Growth Domestic Product (GDP) for agriculture is still far behind Manufacturing and Services industries. Among the issues were low up take of agriculture technology and innovations due to high initial investment, high risk, hard to access for loan. As crowdfunding is a new emerging financing alternative, thus this paper is to understand the potentials and challenges of Agricultural Technology-Based Crowdfunding (ATCF). For a better understanding, we performed a qualitative study based on semi-structured interviews of above 18 years old Malaysian citizen. The respondents *were randomly engaged. Data from the interviews were later transcribed into verbatim, analysed within and cross cases, coded, categorised, and grouped into the emerging themes. The findings were displayed in a table in responding to the research objectives. Few future research have also been identified and proposed to strengthen the study on the subject matter.*

Keywords: *crowdfunding, agriculture technology, Malaysian context*

INTRODUCTION

Crowdfunding or crowd financing is 'the collective effort of individuals who engage in network and pool their money, usually via the Internet, to support efforts initiated by other people or organisations' (Ordanini *et al*., 2011). Crowdfunding is supported by web-based platforms (i.e., RocketHub, Kickstarter, and IndieGoGo) or social media (Instagram, Facebook, and Twitter), as well as online payment transfer services such as PayPal, MoneyGram, and others. 'Crowdfunding' has become an important and a new potential alternative financial source for entrepreneurs (Sancak, 2016; OECD 2015). In 2014, the crowdfunding market growth up to RM 68 billion worldwide and continued accelerating to RM 144.5 billion in 2015. Asia Pacific generating RM 4.7 billion in 2015 (Asian Institute of Finance, 2017). There is total of 1,250 crowdfunding platforms (CFPs) across the globe. CFPs in Asia was represented by 13.5% platforms (Massolution, 2013).

Problem statement

Despite being blessed with fertile soil and avail environment for agricultural development and numerous initiatives and injection of R&D and technology development grants for agriculture agenda, Agricultural Gross Domestic Product only contributed 6.5% of Malaysian Q1 2020 GDP, far behind Services and Manufacturing sector (Department of Statistic, 2020). Among the reason denoted, due to the rate of agriculture technology adoption remained low in developing countries as being reported by Margaret and Samuel (2015). This has been asserted by a study reported by Yigezu *et al.* (2018) that the main constraint farmers hinder to adopt technologies and innovation due to high initial investment. According to a census by Department of Statistics Malaysia, only approximate 20% financing for

SMEs came from financial institutions and government loans. Furthermore, venture capitalists and angle investors are not the preferred options since they only invest a maximum 2.5% of the applicants that they evaluated. Most of the sources are either borrowing from friends and family (Shaista & Hemalatha, 2020). Investment for modern technology adoption and financing for start-up, small scale growers, farmers, and entrepreneur really a challenge. Among the major constraints for approval by banking institutions such as insufficient documents, no financial track records/ credit history, lack of collateral, no reputation and high risk due to anonymous and unproven technology adopters project proposal (Blade, 2018).

Crowdfunding approaches seems to be an alternative for the source of financing agricultural technology-base businesses. As to date there are only 10 registered ECF and 11 P2P in Malaysia. However, none directly involve into Agriculture Technology-Based Crowdfunding. Although, Malaysian has been among the first Asian countries to embrace crowdfunding by having a proper regulatory way back in 2015, the study on crowdfunding among Malaysians are still limited ascertained by Asian Institute of Finance's report, 2017. The study which involves 1,332 Malaysian public respondents and further 300 respondents from small medium business owner has reported 86% of the public didn't know about crowdfunding, 12% having 'low' understanding and only 1% having 'high' understanding about the concept of crowdfunding and 70% of the survey only willing to invest RM 100 per project. Although there is an increase in the study of crowdfunding in the Malaysian context on past few years, however it's still reported to be unfamiliar relatively to many people especially on the type of crowdfunding business area (Bergamini, Navarro, & Hilliard, 2017; Mokhtarrudin, Masrurah, & Muhamad, 2017). The number is further deprived when comes into the Agriculture Technology-Based Crowdfunding project intention. Further, there is still limited and little understand about how, why, where, when and what type of crowdfunding (business area) users prefer to engage. Thus, the aims of this paper are to understand the potentials and challenges of Agricultural Technology-Based Crowdfunding (ATCF). To gain such insight, this paper is designed and implemented a qualitative study to answer the following questions: The potentials and challenges of Agricultural Technology-based Crowdfunding?

This seems significant to provide in depth inside to the government and the policy maker in order to craft proper policies, strategies and tools towards the success of empowering the agriculture sector i.e., either crowdfunding initiative is significant and really in need by the Malaysian and shall be promoted.

LITERATURE

Crowdfunding

Crowdfunding is considered new financial instrument for start-up and small and medium enterprises (Beaulieu *et al*., 2015). Access to funds through crowdfunding could enable small scale farmers and agriculture entrepreneurs to adopt and utilised innovation and modern technology. Crowdfunding is defined as the collection of funds from the public on web-based platforms for specific projects, business ventures or social causes (Mohamed Asmy, 2018). The idea of crowdfunding is to come in practice with the aid of web-based platform (i.e., RocketHub, Kickstarter, and IndieGoGo) or social media (Instagram, Facebook, and Twitter), as well as online payment transfer services such as Paypal, MoneyGram and others.

Crowdfunding is divided into monetary and non-monetary motives which is then further divided into four categories. They are: (i) reward-base, (ii) donation-base, (iii) equity-base and (iv) lending-base/ peer to peer (Norhafiza & Rabihah, 2020; Massolution, 2013). In reward-based crowdfunding, the primary objective of funders is to gain a non-financial reward. In donation-based crowdfunding, funders donate to causes that they want to support, with no expected compensation. Whereas in equity-based crowdfunding, funders receive compensation in the form of fundraiser's equity-based or revenue, or profit-share arrangements. Finally, in lending-based crowdfunding, funders receive fixed periodic income and expect repayment of the original principal investment. In other words, equity-based and lending-based crowdfunding considered as crowdfunding for financial return, while donation-based and reward-based crowdfunding are used for campaigns that appeal to funders' personal beliefs and passions. The scope of crowdfunding projects are diverse such as for business start-ups, development projects, catastrophe aids, scientific research, entertainment such as video games, movies and music, political campaigns, utilities, and many other targets.

Accordingly, agricultural crowdfunding is an emerging product of the combination of agriculture base activity or project and crowdfunding business model (Linmeng, 2019). Agricultural crowdfunding projects have been a huge success and flourished throughout the worlds. For instance, Kickstarter among the establish Crowdfunding platform in the world, has a special 'Food' section. Since 2007 to 2016 Kickstarter has collected US 93 million for Agri-Food projects and hosted more than 22 thousand of food projects (Kickstarter, 2017). Further, AgFunders was the first equity Crowdfunding platform dedicated to Agri-Food has collected USD 9.3 billion for investments in food sector includes e-commerce, robotics, agricultural inputs, software, food traceability, irrigation, and agricultural production (AgFunders, 2015). In France, the greatest platform in Europe in Agri-Food is Miimosa which hosted 300 projects collecting EU 1.5 million since 2014 (Miimosa, 2016). Another example such as Kiva, which helped financing small holder farmers of low-income countries in agricultural activities of 565,695 farmers, mostly women with a rate of loan of 274$ lent every minute (Kiva, 2017). It has been proven as the alternative approach to mobilise agriculture activities and business especially on adoption of agriculture technology vis to be modern, efficient, high yields, cost effective yet leveraging the initial, start-up, maintenance cost which originally hinder people/ farmers to venture on them.

Crowdfunding in Malaysia

In Malaysia, commercial investment-based crowdfunding made available on 2015 and 2016 respectively when Security Commissioner of Malaysia regulate its frameworks known as Equity Crowd Funding (ECF) – angle investor type funders and Peer to Peer (P2P) – public funders (Asian Institute of Finance, 2017). As to date there are 10 registered ECF and 11 registered P2P in Malaysia.

The government aware the significance this system can impact the country, on National Budget 2019, the government has allocated additional RM 50 million to My Co-Investment Fund (MyCIF) under Security

Commissioner of Malaysia to leverage crowdfunding platform to help financing underserved SMEs (Budget, 2020). As Malaysia has emerged and legalised crowdfunding as means for acquiring funds, yet there is still minimal participation with regards to ECF and P2P-type crowdfunding by the Malaysian.

Research on Crowdfunding

Natalia (2019) on her research on sustainability of crowdfunding has laid out four factors for sustainability of crowdfunding which motivation to seek fund, the platform, cost of the project and the relationship with the funders. Achsania *et al.* (2019) on their study on developing Islamic crowdfunding platform stated that there is an issue to current crowdfunding relatively to low trust as it relates technology-based of high level of fraud risk. A study on the role of social awareness over the success of crowdfunding platform has reported that technology readiness plays important role and have a strong correlation with the success of a crowdfunding (Wahjono *et. al.*, 2019). A study on a proposed integrated zakat-crowdfunding model (IZCM) for effective collection and distribution of zakat fund in MALAYSIA by Mohamed Asmy *et al.* (2019) and a study on crowdfunding-waqf model (CWM) in Malaysia similar with Mohamed Asmy *et al.* (2018) have studied users' behavioural intention toward crowdfunding respective models.

On the other hand, Hui *et al.* (2014) on their research found out that crowdfunding works are too overwhelming and incumbent which, mentorship and adequate support tools are really a saviour. Gerber and Hui (2013) claimed that crowdfunding combines elements of online philanthropic behaviour, online consumer behaviour and online peer-to-peer lending whereby online philanthropic behaviour is about provide financing online out of social responsibility, online consumer behaviour relates to consumers expectation and behaviours regards to online market activity where risk and trust always being the main issue and further online peer-to-peer lending is about the interpersonal intimacy between a creator and his funder which leads to subjective behaviour.

Our work extends prior research by exploring the potentials and challenges of agricultural technology-based crowdfunding. In this study, we will investigate in-depth said possibly potentials and challenges from potential creators' perspective, potential funders' perspective, and potential investors' perspective. Findings from this research can inform to design related initiatives or new tools or policies amendments to inculcate Agriculture Technology=Based Crowdfunding adoption by the Malaysian thus crowdfunding platforms being the mechanism on supporting the growth of agricultural sector in Malaysia.

METHODOLOGY

Study Design

This interpretive qualitative research of phenomenological study aims to study human action and reaction towards agricultural technology-based crowdfunding base on human knowledge and experiences to obtain in-depth insights on phenomenon of interest (Yin, 2014).

Respondents

Qualitative sampling is concerned on information richness which involve appropriateness and adequacy. In this research, we interviewed seven Malaysian citizens of more than 18 years old including four male and three females, of age ranging from 26 to 50 years old as respondents. All are government employees having educational backgrounds levelling from diploma to Doctorate with the monthly salary range of RM 2500 – RM 10970. This is supported by Creswell (2007) who recommended a sample size of five to 25 respondents and Clarke and Braun (2013) that suggested for 'small' project six to ten sample size are sufficient if reach data saturation in the interviews. All the respondents were selected via random sampling which fulfilment of study setting and the objective of this study which is to explore the public opinions on understanding the potentials and challenges of Agricultural Technology-Based Crowdfunding.

Procedures and Protocols

This research applied semi-structured questionnaires with open-ended questions of interactive approach (Marshall, 1996). This approach will give the respondents freedom of expression on general and specific topics thus in-depth information shall be acquired. The interviews were semi-structured of open-ended questions which took a range of half an hour to one hour. The interviews were conducted one to one either face to face or via Google Meet sessions. As the interviews to be transcribed into verbatims, thus the medium of communication was in English language. The respondents being told the purpose of the interview and that not to be compensated for their participation. The semi-structured interviews were divided into three sections. The first section is to acquire the demographics and professional background of the respondents and continued with an overview of crowdfunding by the researcher. Later, the respondents were asked with regards to the projects they involved, their introduction to crowdfunding and their current involvement (if any).

On the second section, the researcher asked the respondents to describe their perspective about crowdfunding at large. During the final section, the researcher asked the respondents specific to agricultural technology-based crowdfunding (ATCF), the potentials, challenges and to share any additional views and comments. Below is the checklist of the semi-structured interview questions.

Section 1
1. Demographic profiles
2. Overview of Crowdfunding by the researcher.
3. Have you ever heard about CF/ (Y: when, where, how)?
4. Have you ever experienced/ knew somebody experience CF? (Y: 5W, 1H).

Section 2
1. Your general understanding about CF?
2. Advantages/ Disadvantages of CF?

Section 3
1. Comment on Agriculture Technology-Based Crowdfunding? (Question evolved based on answer)
2. Pro and Cons? (Question evolved based on answer)
3. Potential and Challenges/ Hindrance? (Question evolved based on answer)

4. Motivations or Deterrent? (Question evolved based on answer)
5. SWOT ATCF? (Question evolved based on answer)
6. Any other suggestion for improvements? (Question evolved based on answer)

Data Analysis

As the interest of the study is to know the potentials and challenges of Agricultural Technology-Based Crowdfunding from many perspectives. The researcher engages selective coding and analysis. Within-case analysis (Halinen & Tornroos, 2005) which to identify and list down every instance where respondents communicated pro and cons of ATCF. Furthermore, cross-case analysis were done and the similarities were coded and re-arranged in the specific group of categories. Thematic analytical procedures which include sorting and organising the data to look for patterns and relations between them where the focus is to develop the emerging themes based on the categorise information derived inductively from the data acquired. The categorised emerging themes further summarised in the table form which reflect the objectives of the study.

Table 1: Summary of the Findings

Research Objectives	Emerging themes	Transcribe verbatim/Coded
Potentials of ATCF	High Potential for fund rising	1. Benefit approach to get money for projects. 2. Good approach, as an alternative way to pull fund. 3. CF is a new smart way to gain fund. 4. It's a good solution and fast fund opportunity to small business due to hard-to-get banks' loan. 5. It's a good opportunity to Agri start-up to get fund. 6. Alternative way to get investment for tech savvy, as tech related projects are hard to get loan. 7. No restriction to fun (max/min). 8. Good opportunity for agribusiness. 9. It's a new opportunity to get funders for a new initiative. 10. Young farmers maybe motivated by this approach.
	Helpful for newcomers/ new approach/ unique	1. CF can assist unemployed fresh graduate to embark into agribusiness. 2. Integration of digitisation in pandemic era is a good approach. 3. CF can gain fast response to get funds if show uniqueness. 4. Focus on use of digitisation platform in this time is a good approach. 5. Online which is easy access. 6. Young farmers maybe motivated by this approach. 7. Combine of resources such from small scale farmers, land, money to become big and utilise technology. 8. As a new way for extra income to government employees. 9. New way for retiree to invest on their KWSP.
	Strengthening awareness to increase acceptability	1. Awareness made easy to capture funders. 2. if desirous and well plan Agri Tech based CF can be a good initiative. 3. Potentially done but need awareness.

Challenges of ATCF	Issue of trust (Security)	1. Due to rely on web-base which less physical contact and communication, potential on scam/ fraud. 2. Can lead to fraud as lack of rectification of 100% money gained to be used solely for the projects. 3. Unclear status quo of a project may inculcate risk to the people engaging the ATCF. 4. Trust issue and potential on miss used. 5. Can be not genuine/ abuse thus insecurity if anonymous project. 6. Issue on credibility of project owner exist.
	Issue of trust (Confidence)	1. The success of ATCF maybe on type of tech or purpose of CF project. 2. Need to build up trust among Agri players, farmers, companies and organisations. 3. Need to build up trust ie mass marketing, educate and awareness as current situation, people not believe to ATCF. 4. Hard to get the investor to feel confidence due agricultural output not promising. 5. Lack of exertion to assist ATCF thus hard to get people to get involve. 6. Lack of law enforcement to monitor and control the ATCF activities. 7. Project owner need times, work hard, to proof and persuade potential funders to join. 8. People not confidence to involve due to ambiguous system and output

RESULTS AND DISCUSSION

High Potential for Fund Rising

One of the main findings is that ATCF is a good alternative as its leverage high potential for fund raising. This to be the key information as highlighted by all the respondents. For instance, Respondent 1, 2, 3 and 7 stated that it's a benefit, good approach, and a smart way to get money or pull funds for a project. Accordingly, Respondents 3, 4 and 6 stated that this approach really a relief for agriculture-based SMEs as mentioned below: Respondent 1 said, “It’s a good solution and fast fund opportunity to small business due to hard-to-get banks’ loan” and “…. It’s a good opportunity to Agri start-up to get fund”. Furthermore, Respondents 4 and 5 also confirmed this statement which she mentioned that “…crowdfunding is a good opportunity for agribusiness” and “Young farmers maybe motivated by this approach”.

Helpful for Newcomers/ New Approach/ Unique

Another key finding is that ATCF or Crowdfunding is a relief for new start-up/ new business/ new technology adoption. This can be verified form the statement of Respondents 1-3 which mentioned that crowdfunding can assist unemployed fresh graduate to embark into agribusiness, digitisation in pandemic era is necessitate and motivation to a young farmer, respectively. Moreover, Respondent 2 also mentioned that “…crowdfunding is an alternative way to get investment for tech savvy, as tech related projects are hard to get loan”. As for funders perspective, Respondents 3 and 6 mentioned that crowdfunding or ATCF may be new way for earning extra income for government employees and retirees.

Strengthening Awareness to Increase Acceptability

As there is empirical study that crowdfunding in general is still anonymous by Malaysia, thus mass campaign and awareness shall be perpetrate to the public at large to educate, inform, and propose the potentials and the advantages of crowdfunding and further educate the ready and availability of law and legislation to confer the crowdfunding activities especially for equity and peer-to-peer type of crowdfunding. The success for an Agri-food crowdfunding is fundamentally based on the champaign itself (Andrea & Elena, 2018). This has been asserted for example from the respond of Respondents 4 – 5 respectively: Respondent 4, “Awareness made easy to capture funders”, meanwhile Respondent 5 stated if desirous and well plan Agri Tech based CF can be a good initiative and further ATCF is potentially done but need awareness.

Issue of Trust (Security)

Nevertheless, there still challenges and hindrance for ATCF which on the issue of trust of security and confidence on the system. For instance, as mentioned by Respondent 2 that "Due to rely on web-base which less physical contact and communication, potential on scam/ fraud". Another reason as described by Respondent 3, whereby a project owner tends to mis-used the fund for other purposes than the project as lack of rectification of 100% money gained to be used solely for the projects. Further, the issue of unclear status quo of a project may inculcate risk to the people engaging the ATCF (Respondent 3). This is similar finding as stated by (Achsania *et al.*, 2019) on their study on developing Islamic crowdfunding platform that low trust to crowdfunding as it relates technology-based of high level of fraud risk.

Issue of Trust (Confidence)

Lastly, based on the interview sessions, another discouraging finding was the issue of confidence level towards the system. As Respondent 4 stated "Lack of law enforcement to monitor and control the ATCF activities". This may be due to lack of knowledge/ not aware on the system, the establishment of the law and legislation and might be true in some extend. Another reason may be due to unfamiliar/ lack of confidence to the type of technology or purposes of a crowdfunding project which asserted by Respondent 6 whereby she stated that when regards to ATCF, "People not confidence to involve due to ambiguous system and output". Further Respondent 5 has informed that "Need to build up trust among Agri players, farmers, companies and organisations, which include built up trust in mass marketing, educate and awareness as current situation, people do not believe to ATCF".

FUTURE RESEARCH

Our findings present many new questions for future research. For instance, on the issues of risk of either security or confidence, once shall embark to study on said subject either, there really an issue of risk due to lack or any loophole in the system, law, and legislation or merely due to lack of understanding and awareness of how the system fully operated.

Further, the study can be extended to get in-depth information and perspectives from people who experienced crowdfunding themselves either from the project owners' perspective, funders' perspective and/or investors' perspective. Another potential study expansion towards a focus group of experts in the fields of i.e., Agriculture entrepreneurs, System providers, Ministry of Agriculture's representative and Food, MARDI's representative and/or Malaysian Security Commissioner's representative.

We hope by understanding the potentials and challenges of ATCF, thus local authorities, policy makers, ministry of agriculture and food and all other relevant bodies shall together to establish viable strategies to immaculate agriculture industry assisted by crowdfunding or Agriculture Technology-based Crowdfunding which public feel confidence off.

CONCLUSION

Agriculture Technology-Based Crowdfunding seems to have a promising future in Malaysia. Nevertheless, there are few points to ponder such as need to strengthening awareness of the existence of crowdfunding availability in Malaysia as current situation in Malaysian crowdfunding in general still anonymous and to promote ATCF as platform for promoting and strengthening digital economy, the need to educate and make aware on the establishment of law legislation of crowdfunding in Malaysia, maybe to strengthen them to eradicate insecurity conception by the public at large and build people's trust and last but not least the alignment among Ggovernment, industries, and farmers to work hand in hand to sync resources to make ATCF popular (from the potential project owners' perspective and potential funders' perspective) and may look to improve tools and expand initiative of collaboration among stakeholder i.e. farmers, growers, SMEs to up-take any ATCF.

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A Comparison of Learning Preference and Learning Challenges Between Science and Non-Science University Students

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ABSTRACT

Due to the need for rethinking the education system designed centuries ago, it is essential to understand the current challenges of the university learning environment. We aimed to compare the learning preferences and learning challenges between science and non-science university students. 109 individuals participated in the online survey. The dependent, collaborative and independent learning preferences were inspected. The internal and external factors of learning challenges were examined jointly with social support systems, motivation, and coping styles. Both groups displayed comparable learning preferences ($p>0.05$) except for social media. Eight out of 17 learning challenges were significantly different between science and non-science students ($p<0.05$). Both groups reported analogous support systems ($p>0.05$) except for housemates. Similar intrinsic and extrinsic motivations were unveiled ($p>0.01$). Dissimilar mature and neurotic coping styles were revealed ($p<0.05$). In conclusion, learning preferences between science and non-science students are relatively similar, but the learning challenges vary.

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Keywords: learning environment, learning preference, learning challenges

INTRODUCTION

Although the main goals of universities remain relatively the same, the way students experience them has transformed considerably over the years (Rodrigues, Almeida, Figueiredo, & Lopes, 2019). The learning environment has attracted considerable attention from both scholarly and public's interest (Ndirangu & Udoto, 2011). The issue of a conducive learning environment for learners to engage and interact with learning new skills has received considerable attention, covering early childhood, primary, secondary and tertiary education, respectively (Hopkins & Reynolds, 2001). A good learning environment can be an immense attribute to the accomplishment of the learner. A conducive learning environment is not limited to physical environments alone but extends to the psychological, social or cultural factors that can influence learning capabilities.

The learning environment can either be a threat or sustenance to learn new knowledge or skills. A positive learning environment fosters a positive learning culture that leads to better and more promising learning outcomes. Stress is a common condition that has been reported to have a considerable impact on cognitive functioning (AlAteeq, Aljhani, & AlEesa, 2020; Ang & Huan, 2006; Behere, Yadav, & Behere, 2011; Lazarevic & Bentz, 2021; Reddy, Menon, & Thattil, 2018). There is evidence that motivation and coping mechanisms play a crucial role in optimising the learning environment (Deci *et al*., 1991; Ganesan *et al*., 2018). This integration of positive motivation and proper coping strategies in the learning environment can assist learners in stopping negative thinking from spiralling downward (Deci *et al*., 1991; Ganesan *et al*., 2018). Coping mechanisms are psychological strategies in protecting the individual from unacceptable thoughts or feelings (De Pasquale *et al*., 2020). They are generally divided into mature, neurotic, and immature mechanisms (Bowins, 2010; Carvalho, Reis, & Pianowski, 2019). Coping mechanisms used by the students have been reported to affect their academic performances (Negriy, 2016). The effects of social support on learning abilities have also been reported (Friedlander, Reid, Shupak, & Cribbie, 2007; Hinderlie & Kenny, 2002; Uleanya, 2020). In this study, the learning environment is examined from two perspectives –

the learning preferences and learning challenges. The learning preferences are deliberated by dividing imto lecturer-centred learning, collaborative learning with peers and independent learning using technology like Internet of Things. The learning challenges investigation covers the challenges of learning itself due to internal and external contributing factors; availability of support system; intrinsic and extrinsic motivational factors; and ability to make choices of mature and immature coping styles.

Thinking styles has been linked to emotional intelligence (Herbst & Maree, 2008; Moore, Snider, & Luchini, 2012). Brain hemisphericity influences the individual's learning style, intellectual and personality characteristics (Boyle, 1998; Shiflett, 1989). Brain hemisphericity has been suggested to vary with types of students (Saleh, 2001). Students majoring in education, nursing, communication, and law were found to be mainly right-brained, while students majoring in business/commerce, engineering, and science were found to be predominantly left-brained (Saleh, 2001). The left and right-brained tendency may indicate that preference of learning styles may be different between disciplines. Neuroscience studies have documented a theory of left-brained and right-brained dominance (Bryden, 1990; Herbst & Maree, 2008). The thinking process of the right brain is dissimilar to that of the left brain (Soyoof, Jokar, Razavizadegan, & Morovat, 2014). Left-brained learners are believed to have a digital brain that excels in science and mathematics due to its logical, analytical and systematic thinking process. Right-brained learners, meanwhile, are thought to have an analogue brain that stands out in arts and languages due to its creative and intuitive thinking mode. Hypothetically, a student enrolled in the science stream have a better analytical and logical thinking process to excel in science subjects than non-science students and vice versa in creative and intuitive thinking. In addition, right-brain learners have been reported to possess holistic emotional intelligence in comparison to left-brain learners. Right-brained thinking styles have been positively linked to both emotional intelligence management and emotional intelligence awareness. In contrast, left-brained thinking has been negatively related to both total awareness but was not associated with total management. So far, there has been limited information on the learning environment between science and non-science students. This research project aims to compare the learning preferences and learning challenges between science and non-science students in the same institution of higher learning.

METHODOLOGY

Ethical approval was obtained from the UiTM Research Ethics Committee [600-TNCPI (5/1/6) REC/03/2021 (UG/MR/216)]. The data collection of this cross-sectional survey was conducted through an online questionnaire using the Google Form platform in May 2021. The questionnaire was developed by combining the questions from HWRI survey form (Chen, 2020) and DSA-40 with modification (Vaillant, 1971). Learning preferences and learning challenges were the two main scopes of the survey (Table 1). Three types of learning preferences were studied, namely lecturer-centred learning (two items), collaborative learning with peers (three items) and independent learning using technology (three items). Under the learning challenges investigation, we examined the challenges in the learning environment with a total of 17 items. There were six items on the internal factor and 11 items on the external factor. The external factor was subdivided into the relationship (six items) and infrastructure issues (five items). We studied the alternative support platform from both internal (four items) and external (four items) perspectives. There were eight items in the motivation section (four for intrinsic and four for extrinsic motivation probe). We explored the coping styles with 40 items. The mature coping style encompassed anticipation, humour, sublimation, and suppression. The neurotic copy style contained idealisation, pseudo-altruism, reaction formation, and undoing. The immature coping style included acting out, autistic fantasy, devaluation, displacement, dissociation, isolation, denial/negation, passive aggression, projection, somatisation, rationalisation and splitting.

Table 1: Scopes of Learning Environment Investigation and Respective Descriptions

Two main scopes		Descriptions
Learning preferences	Learning preference (eight items)	Lecturer-centred learning (two items) • The lecturer who teaches the subject • The lecturer that you are most close with Collaborative learning with peers (three items) • Best friends at university • Classmates that you are close to • Classmates who are the best in that particular subject Independent learning using technology (three items) • Search for a solution myself using formal legit channel • Search for a solution myself through the internet or professional website • Search for a solution from social media such as Facebook, Instagram, Twitter etc
Learning challenges	Challenges of the university learning (17 items)	Internal factor (six items): • Lack of Interest in the course • Time constraint • Poor self-discipline • Personal health issue • Emotional turmoil • Stress External factor: • Relationship issue (six items): ○ Lack of family support ○ Unsupportive lecturer ○ Peer rivalry ○ Negative Gossiping ○ Dealing with difficult people ○ Housemate conflicts • Infrastructure issue (five items): ○ Financial problem ○ Lack of facility ○ Poor access to literature/ reference/reading materials ○ Learning overload ○ Poor quality of teaching environment

	An alternative support system to deal with challenges of university life (eight items)	Internal (four items): • Dean • Head of the program • Year coordinator • Academic advisor External (four items): • Housemates • Best friends not from university • Parents • Siblings
	Motivation (eight items)	Intrinsic motivation (four items): • Knowledge Quest • Self-satisfaction • Self-actualization • Sense of responsibility Extrinsic motivation (four items): • Peer Recognition • Peer pressure • Job security • Family factor
	Coping style (40 items)	If I can predict that I'm going to be sad ahead of time, I can cope better. (anticipation)
		When I have to face a difficult situation, I try to imagine what it will be like and plan ways to cope with it. (anticipation)
		I'm able to laugh at myself pretty easily. (humour)
		I'm usually able to see the funny side of an otherwise painful predicament. (humour)
		I'm able to keep a problem out of my mind until I have time to deal with it. (suppression)
		I can keep the lid on my feelings if letting them out would interfere with what I'm doing. (suppression)
		I work out my anxiety through doing something constructive and creative like painting, drawing etc. (sublimation)

		Sticking to the task at hand keeps me from feeling depressed or anxious. (sublimation)
		I get satisfaction from helping others, and if this were taken away from me I would get depressed. (pseudo-altruism)
		If I were in a crisis, I would seek out another person who had the same problem. (pseudo-altruism)
		I always feel that someone I know is like a guardian angel. (idealization)
		There is someone I know who can do anything and who is absolutely just and fair. (idealization)
		If someone mugged me and stole my money, I'd rather he be helped than punished. (reaction formation)
		I often find myself being very nice to people who by all rights I should be angry at. (reaction formation)
		After I fight for my rights, I tend to apologize for my assertiveness. (undoing)
		If I have an aggressive thought, I feel the need to do something to compensate for it. (undoing)
		People tend to mistreat me. (projection)
		I am sure I get a raw deal (unfair deal) from life. (projection)
		No matter how much I complain, I never get a satisfactory response. (passive aggression)
		If my boss bugged me, I might make a mistake in my work or work more slowly so as to get back at him. (passive aggression)
		I often act impulsively when something is bothering me. (acting out)
		I get openly aggressive when I feel hurt. (acting out)

		Often I find that I don't feel anything when the situation would seem to warrant strong emotions. (isolation)
		I get more satisfaction from my fantasies than from my real life. (autistic fantasy)
		I pride myself on my ability to cut people down to size. (devaluation)
		I'm a very inhibited person. (devaluation)
		I live more of my life in my dreams than in real life. (autistic fantasy)
		People say I tend to ignore unpleasant facts as if they didn't exist. (negation)
		I'm often told that I don't show my feelings. (isolation)
		I fear nothing. (negation)
		Doctors never really understand what is wrong with me. (displacement)
		When I'm depressed or anxious, eating makes me feel better. (displacement)
		I ignore danger as if I was Superman. (dissociation)
		I've special talents that allow me to go through life with no problems. (dissociation)
		Sometimes I think I'm an angel, and other times I think I'm a devil. (splitting)
		As far as I'm concerned, people are either good or bad. (splitting)
		I get physically ill when things aren't going well for me. (somatization)
		I get a headache when I have to do something I don't like. (somatization)
		I am able to find good reasons for everything I do. (rationalization)
		There are always good reasons when things don't work out for me. (rationalization)

The Cochran's Sample Size Formula with the confidence interval of 95% and margin of error of 5% was used to calculate the sample size. The inclusion criteria were local university undergraduate degree students, and the exclusion criteria were certificate, diploma and postgraduate students. The online questionnaire was sent out to 150 students from science disciplines and 150 students from non-science disciplines in the same public university.

Statistical Package for Social Sciences (SPSS) software version 23.0 (SPSS Inc. Chicago, IL, USA) was used for data entry and analysis. Significance levels were set at p-value <0.05. The 5-point Likert scale was selected to assess learning preference, challenges in university life, and motivation. The dichotomous approach was picked to investigate the coping styles. Mann Whitney U test was used to analyse the categorical data (ordinal) between two independent groups of science and non-science.

RESULTS

By the end of the survey period, data had been collected from 109 individuals, 59 of whom were science students (54.13%) and 50 non-science students (45.87%). The response rate was approximately 36.33%. Approximately 59.63% (65) were female, and 40.37% (44) were male. About 72.88% (43) were female, and 27.12% (16) were male in science, while the non-science students consisted of 44% (22) female and 56% (28) male.

In the learning preference investigation, respondents were asked to rate three pre-determined learning preferences: lecturer-centred learning, collaborative learning with peers, independent learning using technology. Five answer options were provided: never; only in a desperate situation; neutral feeling; one of the common choices; always my first choice. Collaborative learning with peers was consistently rated higher than more dispersed distribution in independent learning with technology. The lecturer who teaches the subject, best friends from the same university, classmates that are close or best in that subject were the common or first choice. The most surprising aspect of the data was in information searching preference. Platforms such as professional websites were preferred than formal legit channels within the university and social media such as Facebook, Instagram, Twitter etc. The comparison results of the Mann Whitney U Test analysis are shown in Table 2. No significant difference was found between the two groups in lecturer-centred learning, and no significant difference between the two groups was evident in collaborative learning with peers. In terms of independent learning with technology, only social media platform is substantially different.

Table 2: The Comparison of Learning Preferences between Science and Non-Science Students

Personnel that learner will approach for academic or learning problem	Mann Whitney U Test	*p*-value
Lecturer-centred learning		
The lecturer who teaches the subject	1317	0.32
The lecturer that you are most close with	1282	0.23
Collaborative learning with peers		
Best friends at university	1243	0.13
Classmates that you are close to	1408	0.66
Classmates who are the best in that particular subject	1386	0.56
Independent learning with technology		
Search for a solution myself using formal legit channel	1415	0.71
Search for a solution myself through the internet or professional website	1325	0.34
Search for a solution from social media such as Facebook, Instagram, Twitter etc	1111	0.02**

** Significance level at $p<0.05$

Both internal and external factors that affect the learning journey and university life were examined in this study. The internal factors covered the lack of interest in the course, time constraint, poor self-discipline, personal health issue, stress, and emotional turmoil. The external factors on relationship included lack of family support, unsupportive lecturer, peer rivalry, negative gossiping, dealing with difficult people, and housemate conflicts. The external factors on infrastructure comprised of financial problems, lack of facility, poor access to literature/reference/reading materials, poor quality of teaching environment, and learning overload. Five main challenges seem to affect university learning: lack of interest, time constraints, stress, poor quality of learning environment, and learning overload. It is apparent from Table 3 that three internal factors (time constraint, poor self-discipline, stress), one external relationship factor (dealing with difficult people), and four external infrastructure factors (lack of facility, poor access to literature/reference/ reading materials, poor quality of teaching environment, learning overload) are significantly different between science and non-science students ($p<0.05$).

Table 3: The Comparison of Contributing Factors that Affect the University Learning Journey between Science and Non-Science Students

Factors	Mann Whitney U Test	*p*-value
Internal:		
Lack of interest in the course	1474	0.99
Time constraint	1163	0.04**
Poor self-discipline	938	<0.01*
Personal health issue	1326	0.35
Emotional turmoil	1190	0.07
Stress	1155	0.04**
External (relationship):		
Lack of family support	1427	0.77
Unsupportive lecturer	1402	0.64
Peer rivalry	1367	0.50
Negative Gossiping	1417	0.72
Dealing with difficult people	1092	0.02**
Housemate conflicts	1337	0.38
External (infrastructure):		
Financial problem	1427	0.77
Lack of facility	917	<0.01*
Poor access to literature/reference/ reading materials	1074	0.03**
Poor quality of teaching environment	1076	0.01**
Learning overload	1009	<0.01*

* Significance level at $p<0.01$
** Significance level at $p<0.05$

To understand the role of the alternative supporting system available for learners in dealing with academic or learning problems, respondents were asked to rate the pre-determined eight potential personnel that they might approach. The five answer options were provided: never; only in a desperate situation; neutral feeling; one of the common choices; always my first choice. The single most striking observation from the data is that authoritative figures like the dean, head of the program, and year coordinator were hardly the first choice. The academic advisor has quite a balanced distribution of the five answer options. Best friends not from university, housemates, parents and siblings were more on neutral ground. The significant difference between the two groups was only found in the category of housemates (Table 4).

Table 4: The Comparison of the Choice of Personnel to Discuss Academic or Learning Problems between Science and Non-Science Students

Personnel that learner will approach for academic or learning problem	**Mann Whitney U Test**	***p*-value**
Internal:		
Dean	1395	0.57
Head of the programme	1256	0.15
Year coordinator	1211	0.92
Academic advisor	1383	0.57
External:		
Best friends not from university	1379	0.55
Housemates	878	<0.01*
Parents	1402	0.64
Siblings	1272	0.19

* Significance level at $p<0.01$

All motivation factors are rated as above the midpoint Likert scale. The most interesting aspect of these findings is that science and non-science students rated ‘not to disappoint family’ as the most important factor. As Table 5 shows, there is no significant difference between science and non-science except for knowledge quest ($p< 0.05$).

Table 5: The Comparison of Intrinsic and Extrinsic Motivation between Science and Non-Science Students

Motivation	Mann Whitney U Test	*p*-value
Intrinsic		
Knowledge quest	1105	0.02**
Self-satisfaction	1186	0.064
Self-actualization	1471	0.98
Sense of responsibility	1424	0.74
Extrinsic:		
Peer recognition	1389	0.59
Peer pressure	1444	0.85
Job Security	1204	0.08
Not to disappoint family	1409	0.66

** Significance level at $p<0.05$

Interestingly, more than 50% of the students picked 'yes' as answers for each category of the mature coping types. The results for neurotic coping styles were mixed. Only pseudo-altruism and undoing categories of neurotic coping styles received more than 50% of 'yes'. However, positive responses for both idealization and reaction formation were not far below 50%. Less than 50% of the students opted for the immature coping styles in each cluster except for rationalisation. Only eight coping styles were significantly different between science and non-science students (Table 6). Two from mature coping styles: anticipation and suppression, and two from neurotic ones: idealisation and undoing. Four from immature coping techniques: passive aggression, isolation, splitting and somatization. Further analysis revealed that there was a significant difference in preference percentages between science and non-science students in mature coping style (Mann Whitney U Test = 1139, $p<0.05$) and neurotic coping style (Mann Whitney U Test = 894, $p<0.01$), but not in immature coping style (Mann Whitney U Test = 1164, $p=0.058$).

Table 6: The Comparison of Coping Styles between Science and Non-Science Students

Coping Styles	Mann Whitney U Test	*p*-value
Immature		
Projection	1247	0.140
Passive-aggressive	1092	0.012**
Acting out	1254	0.138
Isolation	1146	0.032**
Devaluation	1387	0.551
Autistic fantasy	1427	0.753
Denial/Negation	1335	0.337
Displacement	1342	0.358
Dissociation	1422	0.706
Splitting	1115	0.013**
Somatization	1175	0.048**
Rationalization	1441	0.809
Neurotic		
Pseudo-altruism	1250	0.133
Idealization	1126	0.022**
Reaction formation	1396	0.601
Undoing	809	<0.01*
Mature		
Suppression	1167	0.040**
Sublimation	1467	0.958
Humour	1376	0.521
Anticipation	1121	0.018**

* Significance level at $p<0.01$
** Significance level at $p<0.05$

DISCUSSION

Very little was found in the literature on the question of learning preferences. Generally, the lecturer was regarded as the first teacher, peers as the second teacher and the internet as the third teacher in the learning ecosystem. Lecturer-centred learning was the traditional approach where the lecturer's function was merely presenting information to the students who are expected to receive the knowledge being presented passively. Collaborative learning refers to various educational approaches involving a joint intellectual effort by students (Han, Kim, Rhee, & Cho, 2021; Michael Nussbaum, 2008; Noroozi, Weinberger, Biemans, Mulder, & Chizari, 2012). Collaborative learning activities can be very diverse but mostly pinned on students' exploration or application of the course material and not just the lecture notes. Although collaborative learning plays a vital role in gaining knowledge and enhancing competencies, students may face difficulties participating in a group discussion. Students may find it difficult to view a problem from others' perspectives, support their opinions with evidence or make counterarguments. There were many ways in which technology can support greater independent learning for learners (Kovalyova & Loksha, 2020; Naveed, Alam, & Tairan, 2020; Sykes, Postma, Uys, Brandt, & Crafford, 2020; Torres-Díaz, Duart, Gómez-Alvarado, Marín-Gutiérrez, & Segarra-Faggioni, 2016). Internet usage is increasing rapidly, especially for three-tier learning from primary to secondary and tertiary education. Our findings revealed that both lecturer-centred learning and collaborative learning with peers are relatively rated higher. More dispersed distribution was found in independent learning with technology. There is a lot of potentials to tap into the information available on the internet. The internet can be valuable for students to foster self-learning, widen the scope of reading and learning, perform information search ahead of scheduled lecture slot, explore additional information to complete multiple assignments, and encourage peer learning.

Stress is increasingly recognised as a severe concern in students' academic life (AlAteeq *et al.*, 2020; Ang & Huan, 2006; Behere *et al.*, 2011; Lazarevic & Bentz, 2021; Reddy *et al.*, 2018). Various internal and external factors can trigger feelings of stress. The present study consistently rated five main challenges (learning overload, time constraints, stress, lack of interest, poor quality of learning environment) to affect university learning. Experiencing difficulty managing the academic workload at university was not uncommon (Bitzer & Bruin, 2004). Learning overload was negatively related to adjustment to university life. Learning overload and time constraints reflect the students' mindsets of being overwhelmed by the academic requirements while pursuing a degree at university (Kamel, 2018). Students' perceptions of their ability to cope with academic requests can affect their interest and effort (Petersen, Louw, & Dumont, 2009). Low interest and effort were linked to academic performance and adjustment to university life (Chambel & Curral, 2005). Overloading students causes academic stress and affects mental and physical health that can hinder learning. Science and non-science students in the present study exhibited variation from many aspects of challenges in university life. Science students encountered more infrastructure challenges such as lack of facility, poor access to information, poor quality of teaching environment, and learning overload. Science students also reported more stress, time constraint, poor self-discipline, and dealing with difficult people.

Several studies have documented that social support was related to and predictive of adjustment to university life (Friedlander *et al*., 2007; Hertel, 2002; Hinderlie & Kenny, 2002; Lidy & Kahn, 2006). Social support can come from multiple sources such as parents, lecturers, friends, coursemates, and university to improve students' adjustment to university life and to cope with academic stress (Demaray, Malecki, Davidson, Hodgson, & Rebus, 2005; Elias, Noordin, & Hj Mahyuddin, 2010). Most students in our study seemed to shun away obtaining help from authoritative internal figures and preferred to seek for external support system instead. This is something that educators need to work on to improve communication, and further research to understand the gaps of communication is thus required.

Academic performance and adjustment to university have been linked to psychosocial variables such as motivation and help-seeking (Petersen *et al*., 2009). There are extrinsic and intrinsic forms of motivation (Deci *et al*., 1991). Intrinsic motivation is the act of doing an activity purely for the joy of doing it that can foster solid and flexible critical thinking skills (Ryan & Deci, 2000b, 2000a; Vansteenkiste, Lens, & Deci, 2006). Extrinsic motivation employs external rewards or punishments to encourage work completion to maintain academic persistence but low interest (Ryan & Deci, 2000b, 2000a; Vansteenkiste *et al*., 2006). Motivation fosters creativity and critical thinking as well as cultivating resilience and self-assurance. A lack of intrinsic and extrinsic motivation can be an obstacle to learning (Ryan & Deci, 2000b, 2000a; Vansteenkiste *et al.*, 2006). Therefore, motivation impacts how likely a student would either give up or move forward. Our subjects seem to have both forms of motivation to navigate their studies. What proved to be stressful was the expectations from parents (Reddy *et* *al.*, 2018). Science and non-science students rated 'not to disappoint family' as the most important driving factor to study. Other factors were rated as lesser roles but were still important. Our findings suggested that university students were relatively resilient and would not easily give up when facing challenges in their studies.

Coping styles have been associated with the general well-being and quality of university life (Hyphantis *et al.*, 2013; Miranda & Louzã, 2015; Salimynezhad, Poor, & Nasiri, 2015). Students use different coping mechanisms to overcome their stress (Walburg & Chiaramello, 2015). The 40 items used in the coping style investigation were modified from the Defence Style Questionnaire (DSQ-40) with minor language and cultural adjustments to fit into the local culture (Andrews, Pollock, & Stewart, 1989; La Cour, 2002). The mature coping style encompassed anticipation, humour, sublimation, and suppression. The neurotic copy style contained idealisation, pseudo-altruism, reaction formation, and undoing. The immature coping style included acting out, autistic fantasy, devaluation, displacement, dissociation, isolation, denial/negation, passive aggression, projection, somatization, rationalisation and splitting. Stress is unavoidable in university students' life (Ganesan *et al.*, 2018). Coping styles have a substantial impact on psychological distress (Ciocca *et al.*, 2020). Coping styles can predict psychological complications (Nezhad, Khodapanahi, Yekta, Mahmoodikahriz, & Ostadghafour, 2011). Immature defence mechanism has been linked to behavioural and personality problems (Carvalho *et al.*, 2013; Carvalho *et al.*, 2019; Ciocca *et al.*, 2020; Pour *et al.*, 2011). In the present study, the coping styles used are significantly different between science and non-science students in mature and neurotic coping techniques, but not in immature coping styles. Only eight coping styles were found to be quite different between science and non-science students: anticipation and suppression (mature); idealisation and undoing (neurotic); passive aggression, isolation, splitting and somatisation (immature). Anticipation is about realistic planning for future discomfort (Walburg & Chiaramello, 2015). The anticipation of a potentially stressful event is one way a person may mentally prepare for it. Suppression is the conscious decision to delay paying attention to anxiety-provoking thoughts, memories, emotions to cope with the present reality, making it possible to access uncomfortable or distressing feelings later whilst accepting them (Walburg & Chiaramello, 2015). Idealisation is a psychological or mental process of attributing overly optimistic qualities to another person or thing (Walburg & Chiaramello, 2015). It is a way of coping with anxiety in which an object or person of ambivalence is viewed as perfect or as having exaggerated positive qualities. Undoing is a defence mechanism in which a person tries to cancel out or remove an unhealthy, destructive or otherwise threatening thought or action by engaging in contrary behaviours (Walburg & Chiaramello, 2015). Passive aggression is a coping mechanism used when people are afraid of displaying anger or feel powerless (Walburg & Chiaramello, 2015). Passive-aggressive behaviour can manifest as resentment and opposition to the demands of others; procrastination and intentional mistakes in response to others' requests; cynical, sullen or hostile attitude; frequent complaints about feeling underappreciated or cheated. Even though peer and lecturer-student relationships are necessary for students' well-being, they can trigger negative feelings and thoughts. A student may feel emotionally isolated despite having an extensive social network. Emotional isolation can act as a defence mechanism to protect a person from distress (Walburg & Chiaramello, 2015). Splitting is a psychological mechanism to tolerate difficult and overwhelming emotions by seeing someone as either good or bad, idealised or devalued (Walburg & Chiaramello, 2015). This makes it easier to manage the emotions that they are feeling. Somatisation involved unconscious rechannelling of repressed emotions into somatic symptoms to transforming uncomfortable feelings towards others into uncomfortable feelings toward oneself: pain, illness, and anxiety (Walburg & Chiaramello, 2015). Nevertheless, a more comprehensive quantitative analysis of the coping styles is required in future research.

The learning preferences and learning challenges can be closely linked in the learning environment of a tertiary education institute. Those prefer lecturer-centred learning adopt dependent learning mode. Proactive learners usually prefer to learn collaboratively with peers; or independently using technology. Proactive learners may encounter less internal challenges, more intrinsic motivational factors and more mature coping styles. The availability of support system is crucial in helping learners to face challenges. Taken together, these results provide insights into the learners and the learning environment. This basic information can move a step forward in developing a more conducive learning environment for a better strategic plan in shaping the future direction of education.

CONCLUSION

The learning environment plays an essential role in learning. This study compared the learning preferences and learning challenges between science and non-science university students. Both science and non-science students seem to have a balanced distribution of the three learning preferences in dealing with academic challenges: lecturer-centred learning, collaborative learning with peers, independent learning using technology. Science and non-science students in the present study exhibited more variation in university life challenges. Both groups reported analogous support systems, and both intrinsic and extrinsic motivations were highly rated. The coping styles differ significantly between science and non-science students in mature and neurotic collections, but not in the immature set.

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The Influences of Dealer-Buyer Relationship Quality, Subjective Norm, and Perceived Value on the Repurchase Intention of Fertilizer among Opish Farmers

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ABSTRACT

Businesses must build a solid relationship with the customers to ensure continuous support for companies to succeed. However, for an agricultural commodity such as fertilizer, knowledge of factors that affect the repurchase of fertilizers by Malaysian oil palm farmers is limited in the existing literature. This study aims to understand the determinants of Oil Palm Independent Smallholder (OPISH) farmers' intention to repurchase the same brand of fertilizers. It emphasizes the role of dealer-farmer relationship quality, the perceived value of Technology Advisory and Transfer Services (TUNAS) officers, and the subjective norm on repurchase intention. The distribution of 1200 questionnaires to OPISH farmers in Peninsula Malaysia, Sabah, and Sarawak led to the applicable return rate of 85.1% (943) completed responses. The multiple regression analysis demonstrated significant positive relationships between TUNAS officers' perceived value, dealer-farmer relationship quality, and OPISH farmers' repurchase intention. However, subjective norm had no significant relationship with OPISH farmers' repurchase intention. The results suggested that selling *farming products such as fertilizer requires a strong correlation between the sellers and farmers and the technical advisory personnel. Effective communication between sellers and farmers, continual follow-up programs, and technical advice are essential in developing a continuous relationship. The study's expressed contribution towards employing the dealer-farmer relationship and perceived TUNAS officers' value, which received little mentioning in the existing literature.*

Keywords: *fertilizer, Malaysia, OPISH farmers, Repurchase intention*

INTRODUCTION

Agriculture is one of the main economic sectors of Malaysia. It contributes to the economic growth and helps to increase people's per capita income. In Malaysia, agriculture projects is designed in a way that is structurally in the 'form of smallholdings owned by families and households in rural areas' (Shafai & Moi, 2015). These smallholder farmers received subsidies and significant aids from the Malaysian government through the Department of Agriculture and various farmer's associations. Shafai and Moi (2015) explains that the subsidy incentive encompasses acquiring chemical fertilizer, pesticides, and seeds. The purchase of farm machinery, irrigation systems, structural systems for land, and land clearing are made through aid (Shafai & Moi, 2015). The Department of Agriculture only extended the grants to the farmers during their agricultural projects' start-up phase. No financial (i.e., cash) incentive is available in the subsidized program (Shafai & Moi, 2015). The use of agrochemicals for fertilizers, particularly for commercial consumption in the country, is significant due to the modern practices in the fields (Mordor Intelligence, 2018). The number of distributors and retailers in the fertilizer industry is huge in Malaysia. As a resulst, farmers countrywide are allowed to have easy access to fertilizers at competitive prices.

In Malaysia, the fertilizer consumption per unit of arable land in 2016 was 1,723.4 kilograms per hectare (Indexmundi, 2019). Malaysia produced around 2.8 million metric tons of fertilizer in 2017 (Statista, 2018). Naturally, oil palm is one of the major agricultural sectors in Malaysia. However, a literature review disclosed that knowledge of factors that affect the repurchase of fertilizers by Malaysian oil palm farmers is limited in the existing literature. According to Nordin *et al.* (2014), the information found in previous works on fertilizer usage primarily focused on the aspects of marketing, agro-climatic conditions, or utility maximisation. Consumer decision-making processes are relatively complex to understand and analyse. Companies that consistently fulfill the market needs would gain competitive advantages (Widana *et al.*, 2015). To be competitive, companies should understand how consumers make their purchase decisions and the factors involved in the process. Satisfied consumers may become permanent buyers for the firm's product's brand. In addition, several relevant authorities in the Malaysian Agriculture Industry commented that the nation's fertilizer industry is efficient and intensely competitive. Therefore, it is essential to understand how farmers made their fertilizers buying decisions, precisely their repurchase intention. The study aims to examine the determinants of oil palm independent smallholder (OPISH) farmers' intention to purchase the same fertilizer brand again.

LITERATURE REVIEW

Repurchase Intention

Repeat buying behavior is referred to the willingness to purchase the same products after people have experienced them (Khuong & Hong, 2016) and, commonly are from the same businesses. Suhaily and Soelasih (2017) proposed that repurchase intention manifests consumers' positive attitudes toward the products (or brands) and retailers. The sense of fulfillment or satisfaction that consumers have about products (or brands) is the one reason that led them to repurchase those items. In addition, Lien *et al.* (2011) believed that behavioral intention shared similarities to one's actual behaviour and held analytical (or diagnostic) value. Furtheremore, Wu *et al.* (2014) posit that consumers' perception of value is most likely; the critical aspect in their intention to repeat purchase.

Dealer-Farmer Relationship Quality

The most common way to purchase Agrochemical products (like fertilizers and pesticides) is by acquiring them through local agricultural supply dealers (Young, 1972). These companies also disseminate information about the products and usage since it helps farmers increase their crop yields (Young, 1972). An efficient communication channel between dealers and farmers is crucial to guarantee that only eligible consumers receive subsidised fertilizers (Redza *et al.*, 2014). More importantly, enough evidence in the literature suggests that communication is vital to strengthening the consumer-supplier relationship (Redza *et al.*, 2014). Therefore, the following hypothesis is formulated:

H1: Dealer-farmer relationship quality significantly influences OPISH farmers' intention to repurchase the same fertilizer brands.

Subjective Norm

Subjective norm can function as the beliefs representing one's thoughts about in-group members' acceptance of a specific behaviour (Mukhtar & Butt, 2012). In this context, subjective norm is the perception of society's pressure on individuals whether to perform or not to perform a particular action. These social influencers may be family members, friends, peers, teachers, politicians, celebrities, or essential people. Besides that, farming neighbors (Young, 1972), families, friends, and agricultural organisations (Hall & Rhoades, 2010) are the social influencers of farmers' buying decisions toward Agrochemical products and the adoption of organic farming. Empirically, it has been used to predict the intention to use pesticides among vegetable farmers (Bond *et al.*, 2009). Thus, the following hypothesis is formulated:

H2: Subjective norm significantly influences OPISH farmers' intention to repurchase the same fertilizer brands.

Perceived Value

Hoe *et al.* (2018) described customer perceived value as the consumer's general evaluation of the value of a product or service compared to its benefits and worth. On the other hand, Zeithaml (1988) sees perceived value as the 'consumer's overall assessment of the utility of a product (or service) based on perceptions of what is received and what is given' (p.14). From both Hoe *et al.* (2018) and Zeithaml's (1988) descriptions, the study defines customers' (i.e., OPISH farmers) perceived value as the overall assessment trade-off of the salient benefits and given components with the TUNAS officer's services. Perceived value is the key motivator of individuals' intention to repurchase products or services (Fang *et al.*, 2016). Hence, the following hypothesis is formulated:

H3: Perceived value of TUNAS officers' services significantly influences OPISH farmers' intention to repurchase the same fertilizer brands.

METHODOLOGY

The research design involves a survey using a structured questionnaire adopted and adapted from previous studies. Trained enumerators distributed and explained the structured questionnaires to targeted samples. The research population comprises almost one (1) million independent smallholder farmers in Malaysia either in Peninsular Malaysia, Sabah, and Sarawak in all agricultural sectors such as rubber, palm oil, and pineapples. However, the study's sampling frame is that individuals dealing with oil palm, specifically the independent smallholder farmers, comprise about 250,000 farmers. Therefore, based on the sampling frame, the total number of questionnaires distributed is 1200. Data was then collected using the quota sampling method to determine an adequate representation of all groups. The period of the data collection was from the second week of January 2019 until the fourth week of February 2019. Overall, it took seven weeks to complete the data collection nationwide.

RESULTS AND DISCUSSION

Demographic Profiles

The distribution of 1200 questionnaires to the OPISH farmers in Peninsula Malaysia, Sabah, and Sarawak led to the applicable return rate of 85.1% (943) complete responses. Most of the farmers were male (78.5%), 46 to 50 years old. Most of them (63.2%) studied until secondary school, and only 11% had tertiary education. 72.1% of the total 943 farmers surveyed relied solely on being farmers. There were 263 farmers (27.9%) who stated that they have permanent jobs. For this group of farmers, 52.5% work in the government sector, and 47.1% work in the private sector. The farms' size ranged from 0.1 hectares to 80 hectares, with a mean size of 4.65 hectares. 44.9% have farms between 1 to 3 hectares, whereas 33.9% have a farm size between 3 to 6 hectares. 36.8% of the farmers yielded between RM1001 and RM2000, and 26.5% yielded between RM501 and RM1000. 62.8% of the farmers managed their farms/plantations themselves, and the remaining 35.1% hired outsiders to manage the farms/plantation for them. Only 54.1% of the farmers surveyed had attended the Malaysian Palm Oil Board (MPOB) program. MPOB F1 is the most preferred fertilizer (38.7%) followed by MPOB F4 (27.6%) and MPOB F5 (25.3%). 68.3% of the farmers have had the experience of obtaining services from the MPOB's TUNAS officer.

Factor Analysis

The result for the independent variables' K.M.O. was 0.959. Based on Kaiser's (1974) range of values, the K.M.O. for the independent variables was 'marvelous' (in the span of 0.90 to 1.00). Thus, it indicates that the sample was adequate and may proceed further for factor analysis. Bartlett's Test of Sphericity for the independent variables showed a significant value (Approx. Chi-Square = 29853.116, $p < 0.001$). It indicates the significance of the correlation matrix and appropriateness for factor analysis. Hair *et al.* (2010) stressed that if Bartlett's test value is highly significant ($p<0.001$); therefore, the factor analysis is applicable. The K.M.O result for the dependent variable was 0.826, which is in the 'meritorious' range (in the span of 0.80 to 0.89). Hence, this indicates that the sample was adequate and may proceed further for factor analysis. The dependent variable's Bartlett's Test of Sphericity showed a significant value (Approx. Chi-Square = 1976.172, $p < 0.001$), which specified the significance of the correlation matrix and appropriateness for factor analysis. Overall, the result is consistent with Hair *et al.*'s (2010) recommendation.

Multiple Regression Analysis

Based on the result in Table 1, this study's variance (r-squared) was 58.4%, which specified that all factors used, explained 58.4% of the OPISH farmers' repurchase intention. Only two variables have significant relationships with the dependent variable from the three variables. The perceived value ($\beta = 0.105$; $p <0.01$) and Farmer–dealer relationship ($\beta = 0.074$; $p < 0.05$) significantly influenced repurchase intention. Whereas subjective norm ($\beta = 0.008$; $p > 0.05$) is not a predictor of repurchase intention. The results showed that the two hypotheses (i.e., H1 and H3) are supported, whereas one (i.e., H2) is not supported.

Table 1: Multiple Regression Analysis

Regression Analysis Variables		Standardised Beta Coefficients	*p*-value
Perceived Value		0.105**	0.000
Farmer-Dealer Relationship		0.074*	0.032
Subjective Norm		0.008	0.068
R	0.764		
R2	0.584		
Adjusted R2	0.579		
F value	127.316		
Sig. F value	0.000		
Durbin Watson	1.852		

This study presented an investigation on the predictors of OPISH farmer repurchase intention. Multiple regression analysis revealed the existence of significant relationships between the dealer–farmer and the TUNAS officers' perceived value with OPISH farmers' repurchase intention. In contrast, subjective norm showed a non-significant association with OPISH farmers' repurchase intention. Selling farming products such as fertilizer required someone who knows and understands the nature of such product, the soil conditions, and farming/agricultural best practices.

These attributes are essential to ensure that farmers would benefit from further improving their farms' performance. Therefore, the representatives, agents, suppliers, or traders of the fertilizers must know the technical and scientific aspects of the products they recommend or sell to the farmers. In addition, the TUNAS officers' perceived value is a significant factor in influencing the farmers' decision to continue purchasing the same fertilizer brand of fertilizer again. Thus, it would be an opportunity for the trader/dealer/supplier of fertilizers to strategise with the TUNAS officers to create sessions/programs with the farmers. This upfront and direct approach allow the farmers to have a better sense of confidence and trust towards fertilizers. The farmers' confidence and trust emanate from the fact that both the TUNAS officers and trader/dealer/supplier of fertilizers comprehensively support them.

CONCLUSION

The study's expressed contribution is to employ the dealer-farmer relationship and perceived TUNAS officers' value, which received little mentioning in the existing literature. Besides adding to the current knowledge to the literature of repurchase intention, the study's findings would beneficially aid the government agencies, traders, and retailers, in dealing with repurchase intention among OPISH farmers more prudently and systematically. The promotional effort in the fertilizer business should extend beyond mere commercial advertising (as advertising was not a determinant of repurchase intention). Instead, it should involve education campaigns for farmers on modern farming techniques, fertilizer usage, and farm management. It could also include trade shows or exhibitions during certain agricultural events such as MAHA, *Hari Peladang*, Smart Farming Expo, and Malaysia Palm Oil Expo. Such activities allow farmers to interact with those with the experience, knowledge, and skills related to oil palm farming and business.

However, this research is limited to a cross-sectional study that evaluates the direct relationship between the predictors and the criterion. In this study, individual farmers indicate the type of fertilizers they purchased or repurchased without examining their understanding and awareness of product knowledge. Also, there was no prior investigation about the purchasing mechanism, including the decision-maker on fertilizers buying. This study was based only on the perception of individual OPISH farmers. Other fertilizer users, conceptualised as the dependent oil palm farmers, like those registered under FELDA and FELCRA, were not part of the research. Hence, future studies may want to consider the perception of dependent oil palm farmers, such as those enrolled under FELDA and FELCRA, and gauge their challenges in influencing their repurchase intentions. The use of fertilizer is also seen to be appropriate for other types of crops. Therefore, it seems logical to investigate different agricultural industries (like cocoa, rice, vegetables, flowers) and agricultural input industries (like seeds, pesticides, equipment) to generalise this study's findings.

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Perception of Food Delivery Rider During Movement Control Order (MCO): A Case Study in Wangsa Maju Kuala Lumpur

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ABSTRACT

Food delivery service in Malaysia is an emerging trend in urban settings prior to 2020 or the COVID-19 pandemic. During the implementation of Movement Control Order (MCO) by the Malaysia government to control the spread of COVID-19 virus, food delivery service was listed as an essential service that was allowed to operate while dine-in at food outlets were prohibited. This study aims to investigate the needs of food delivery services in an urban planning to facilitate during and after COVID-19 pandemic. Wangsa Maju Kuala Lumpur was selected as the case study. This study was conducted on 100 food delivery staffs from Grab Food and Food Panda delivery platform through purposive sampling. Data were collected by questionnaire survey and were analyzed by SPSS software. The findings demonstrated that there were three themes of challenges which are (i) no waiting and resting area, (ii) inadequate and unavailability of parking spaces, and (iii) delivery location issue. The findings served as a platform for future study as well as the development of policy and guidelines together with collaboration planning to improve urban management.

Keywords: *food, food delivery services, Movement Control Order, COVID-19, Kuala Lumpur*

INTRODUCTION

Food delivery service is not new sector in market today, but their reach is expanding to the use of digital applications and smartphones. During the COVID-19 pandemic in Malaysia, food delivery services growth increased significantly due to Movement Control Order (MCO) ordered by the government to control the spread of COVID-19 virus. Following the adoption of MCO, the government has declared food delivery services to be part of the essential services. The Prevention and Control of Infectious Diseases (Measures within Infected Local Areas) (No.2) Regulations 2020 also listed food delivery service in the Federal Gazette on March 31, 2020. Businesses and stores that were judged non-essential had to be shut down during the Movement Control Order (MCO). To preserve social distance between tables, Malaysian restaurants had to restrict their seating capacity. Furthermore, as a result of the economic slump, some people who have lost their jobs, turned to meal delivery as their new source of income. With social distancing that has been ordered by the government, people highly demanded to have takeout food delivered, since it can prevent the people from the infection of the virus. As a result, restaurants and eateries immediately partnered with at least one food delivering platform to prevent their business from shutting down. According to the World Health Organization (WHO), this new situation is called the 'New Normal' pertaining to the changes in human behaviour in terms of the way to live, work, and play. Furthermore, the manner viewing the city also changed substantially, where in this context, focused on the food delivery service. The influence of this service is highly welcomed in the context of urban planning (Acikgoz & Gunay, 2020). To date, the accommodation for the needs of the food delivery service in urban planning in Malaysia is still inadequate since food delivery service is still a new developed concept in Malaysia. This study aims to investigate the perception of food delivery rider on the services and facilities during MCO period particularly in Wangsa Maju, Kuala Lumpur.

LITERATURE REVIEW

History of Food Delivery Service

According to Knodel (2019), the concept of food delivery can be traced all the way back to ancient Rome (753 B.C. – 476 A.D.). Due to the lack of a kitchen in their homes, the poor were left with no alternative for hot meals, which is where the street kitchens came into play which is known as Thermopolium (Knodel, 2019). On the other hand, Gamilla (2021) stated that food delivery started in 1889, when King Humberto and Queen Margherita, the king and queen of Italy, asked chef Raffaele Esposito to have pizza brought to them at their palace. Thus, pizza delivery began. Next, while under British rule during 1890, Thomke and Sinha (2013) reported that the dabbawala meal delivery system is created in Mumbai, India, in which the dabbawalas delivered meals directly to people's workplace using the rail and bicycle (Thomke & Sinha, 2013). Another view from Gamilla (2021), due to the most popular invention of the 1950s that was the television, more families preferred to watch television while enjoying their meals, specifically middle-class American, resulted in many fast-food restaurants introduced takeaway and delivery options (Gamilla, 2021).

The 'New Norm'

The government developed a Standard Operating Procedure (SOP) in the movement of persons to control the spread of COVID-19 cases, which was the biggest contributing element to the 'New Norm' situation. The federal government restricts people's ability to enter or leave a specific area to curb the spread of the COVID-19 pandemic in Malaysia. There are four types of movement control order in Malaysia, which are:

1. Movement Control Order (MCO). MCO is the restriction movement of people to enter or to leave specified area by the federal government for the reasons of controlling the spread of COVID-19 pandemic in Malaysia. Table 1 shows the Standard Operating Procedure (SOP) for MCO.

Table 1: Standard Operating Procedure for Movement Control Order

	Prohibited
1.	Cross-county or state; except emergency, health, employment, economics, vaccinations, and long-distance couples
2.	All forms of ceremonies or social gatherings
3.	Sports or recreational activities
4.	Operation of educational institutions
5.	Dine-in at restaurants and eateries
	Allowed
1.	Akad nikah with determined number of attendance & SOP
2.	Individual sports or recreation in the open area
3.	Students sit for international examinations
4.	Childcare centres, kindergartens, & nurseries operate in accordance with sops.
5.	Only three people in private vehicle, taxi & e-hailing including driver
6.	The number of people in the vehicle carrying the goods depends on the amount allowed in the commercial vehicle registration license
7.	The number of people in public transport must comply with physical distancing & sops are determined
8.	Delivery, drive-thru & take-away meal sales
9.	All sectors of the economy can operate

Source: Ministry of Health Malaysia (2021)

2. Enhanced Movement Control Order (EMCO). EMCO is a stricter order implemented on the condition of a large cluster which was discovered in an area for 14 days. The regulations comprise:
   a. Door-to-door tracing for COVID-19.
   b. All exit and entry points are closed.
   c. Police, Armed Forces and RELA personnel present.
   d. All businesses are shut down.
   e. A medical base will be established within the area.
   f. Adequate food supplies will be given by Social Welfare Department.
   g. Food deliveries until lobby or designated areas.

3. Conditional Movement Control Order (CMCO) refers to the loosening of the MCO regulations, with the main purpose that is to resume the national economy in a controlled approach.

4. Recovery Movement Control Order (RMCO).

Food Delivery Service during COVID-19 Environment in Malaysia

Table 2 below shows the key events on COVID-19 in 2020 and the government imposition on food and beverage industries which become the catalyst in the behaviour change in society to shift to food delivery service.

Table 2: Timeline of Key Events of Covid-19 in Malaysia in 2020

Quarter	Date	Events
Q1 2020	18th March	• From March 18th to March 31st, Prime Minister Tan Sri Muhyiddin Yassin issued a 14-day Movement Control Order (BERNAMA, 2020).
	19th March	• DBKL announced 24-hour eateries will only be open from 6 a.m. to 10 p.m. during the Movement Control Order (MCO) period (New Straits Times, 2020).
	25th March	• MCO extended to April 14th (Anis M. N, 2020).
Q2 2020	2nd April	• The Federal Gazette - Prevention and Control of Infectious Diseases (Measures within Infected Local Areas) (No.2) Regulations 2020 classifies food delivery as an essential service (Arumugam, 2020).
	10th April	• MCO extended further to April 29th (Muhammad, 2020).
	17th April	• COVID-19 screening is required for all food delivery riders, according to Datuk Seri Mohd Ismail Sabri Yaakob (Povera, 2020). • Small businesses and individuals in towns are also permitted to conduct food delivery services as long as they register with their respective municipal authorities (Azil, 2020).
	3rd May	• Starting on Monday, May 4, 2020, food outlets, stalls, and business premises in Selangor will be allowed to operate from 7 a.m. to 10 p.m., but only for takeaways and deliveries (Annuar, 2020) .

	7th June	• The existing Conditional Movement Control Order (CMCO) will be phased out on June 9 and replaced by the Recovery Movement Control Order (RMCO), according to Prime Minister Tan Sri Muhyiddin Yassin. In June, the RMCO eased restrictions on economic and social activity in Malaysia, which businesses allowed to operate throughout the RMCO (Povera & Chan, 2020).
Q3 2020	September	• The third wave of COVID-19 infections has been triggered by the Sabah election. The number of COVID-19 cases is skyrocketing (Bedi, 2020)
Q4 2020	12th October	• From October 14 to October 27, Selangor, Kuala Lumpur, and Putrajaya will be under the control of the CMCO (Yunus & Chan, 2020).
	26th October	• The CMCO is extended until November 9, 2020 in Kuala Lumpur, Selangor, and Putrajaya (Zainul E, 2020)
	7th November	• From November 9 to December 6, CMCO was applied in Peninsular Malaysia, with the exception of Kelantan, Pahang, and Perlis. The current conditional MCO in Selangor, Kuala Lumpur, Putrajaya, and Sabah, which was set to expire on November 9, has been extended till December 6th (Zainul E., 2020).
	5th December	• Except for Sabah, Kuala Lumpur, most of Selangor, and sections of Johor, Negeri Sembilan, Kelantan, and Perak, the Conditional Movement Control Order (CMCO) would be extended until December 20 (Channel News Asia, 2020).
	7th December	• In places under CMCO, including Kuala Lumpur, the National Security Council (MKN) lifted the limit on the number of diners allowed to share tables at eateries (Anis M. N., 2020).
	18th December	• CMCO in Kuala Lumpur and Selangor is extended to 31st December 2020 (Kaos , 2020).
	28th December	• CMCO is further extended to 14th January due to increase of cases (Chan, 2020).

Due to the Movement Control Order (MCO) imposed by the government, consumers have changed their behaviour significantly. According to Angele (2020), food delivery industry has been heavily affected due to the constraints imposed on restaurants, as well as on riders in terms of the delivery procedure. In addition, food delivery service is a solution of a contactless communication which is being enforced by the government to avoid the risk of COVID-19 infection. Due to that, many restaurants globally chose to associate with a third-party delivery service as a form of culture (Cheng, 2016; Syakir Amir *et al.*, 2017b).

Food delivery rider is classified as gig workers, which is an online platform worker (Vallas & Schor, 2020), that plays a part in a formal agreement with the platform companies in providing service for their consumers (Donovan & Lutz, 2016). Majority of the platform worker have to provide their own 'capital equipment' for their work (Stewart & Stanford, 2017). Besides that, majority of the gig workers are not working full-time, and in relation to that, Stewart and Stanford (2017) claimed that gig work acts generally as a complementary for other main job. Payment for gig workers is based on the tasks instead of per unit of time worked.

The rise of food delivery services, specifically food delivery people, has increased employment prospects (Li *et al*., 2020). The workforce in gig economy has a very low commitment since the riders work according to their leisure time. However, according to Tyas *et al.* (2019), food delivery rider are subjected to a poor working condition, considering the high volume of work and the danger in the delivering process.

As mentioned by Shi (2003), urban planning is concerned with creating a more suitable, healthy, effective, and desirable environment for the welfare of the population. Proper living conditions must be supplied through the city, in both its physical and philosophical elements, in which as a result, urban planning must use all of its abilities to suit the demands of the population (Varesi & Mahmoudzade, 2016).

Varesi and Mahmoudzade (2016), Syakir Amir *et al.* (2017a, 2017c) also highlighted the need of an inextricable aspect of human nature, although some of these needs are non-material but nevertheless required for growth and well-being. In order to meet all components of an urban society in an appropriate manner, physical urban planning must progress in line with socio-economic planning.

Food Delivery Service in City Logistics

Last-mile delivery concerns the final stage of the freight transport system from the last distribution centre to the recipient's designated destination address (Lim *et al.*, 2018; Gevaers *et al.*, 2014, and Harrington *et al.*, 2016). According to Allen *et al.* (2018), food delivery service is one of the sub-branches in last-mile delivery, in which, it can be seen that it operates under a high time pressure as 'it must overcome to meet the 'need-it-now' consumer mindset' (Shaikh, 2020).

The growth of food delivery service to some extent contributed to the city logistics system. Morganti *et al*. (2014) as cited in Fancello *et al.* (2017), developed the terms 'food mile' which can be defined as 'the physical distribution of food occurring in the last part of the food supply chain'. Based on Morganti and Gonzalez-Feliu (2015) as cited in Fancello *et al* (2017), food delivery service involved a high frequency of a small delivery size item, which the numerous receivers strewn across the city. In addition, the logistical activities carried out by restaurants, food deliverers, and food delivery platforms are quite complex, on top of, the urban environment's complexity is characterised by stakeholders with varying demands and specifications.

In the food delivery service concept, there are two operations which are restaurant-to-consumer and platform-to-consumer operations (Boyer & Hult, 2005; Li *et al.*, 2020). Platform-to-consumer delivery concept emphasized on providing the customers with prepared-meals or groceries from partners that do not necessarily have to offer delivery process themselves. In this case, the platform, such as Grab Food and Food Panda, controls the delivery process.

On the other hand, restaurant-to-consumer delivery concept is where the restaurant or grocery store itself handles the preparation of the meals or groceries, as well as the delivery of food. The order is made through a restaurant website or a phone call, such as Pizza Hut.

Facilities for Food Delivery Service

Parking Space

Parking regulations and enforcement, as well as safety concerns, have emerged as important issues. A study by Brown *et al.* (2020) found that motor cars frequently hinder other travelers' access when dropping off or picking up food by double parking, parking in 'No Parking' areas, or blocking driveways, which is a problem for delivery drivers, according to the study. The study also found that double parking is often a problem when people drop off or pick up food. Chongqing municipality has devised a new method for offering parking places for last-mile delivery trucks. Food delivery trucks will be given parking spots in areas where parking is in high demand, such as business districts, hospitals, residential neighborhoods, and office buildings. For service provider vehicles, they will be provided with an authorized sticker. Food deliverers will also be provided parking places in high-demand areas. (Xinhua, 2019).

Waiting Area

Currently, there is no study conducted on waiting area for food delivery staff, however during the COVID-19 outbreak, the Ipoh City Council (MBI) took the initiative to construct rest and relaxation (R&R) stops for food delivery riders' temporary relief, with the support of the State Government of Perak (Ipoh City Council, 2021). This is based on the observation of food deliverer welfare as one of the frontliners during the COVID-19 outbreak.

Road Safety

Reported by MIROS, during peak hours, 70% of food delivery staff took risks such as stopping in yellow boxes, jumping red lights, and riding while using their smartphones since the riders are under time pressure to deliver the food on time (Selangor Journal, 2021). According to Selangor Journal (2021), the government and food delivery service companies collaborated on a road safety campaign called 'Ride Carefully, Safe Delivery' to raise road user awareness and lower accident rates.

METHODOLOGY

The research employed online questionnaire survey in order to investigate the needs of food delivery service riders. A total of 100 online questionnaire survey is distributed through purposive sampling which targeting on the food riders specifically Food Panda and Grab Food riders. The selection of the respondents was conducted within Wangsa Maju as the area is a people-concentrated area with huge malls, restaurants, houses and offices.

The respondents were approached by the numerators and were asked to fill up the online survey by considering the physical distancing procedure. The survey incorporates (i) food rider socio-demographic profiles, (ii) food delivery services activities, (iii) challenges of food delivery service during MCO and (iv) delivery route.

RESULTS AND DISCUSSION

Table 3 below illustrated the length of involvement and food rider status. It illustrates that the statement by Umar *et al.* (2020) that COVID-19 had a favorable impact on the Gig economy with many people commenced to work in the industry as well as the high number of customers since MCO started implement in the country by the government. This is also echoed in the study which found that 48% of the respondents commenced to work as food deliverer for the two significant food delivery platform in Malaysia, Grab Food and Food Panda, during the MCO period.

Table 3: Cross-Tabulation of Length of Involvement and Food Rider Status

Length of Involvement	Part-time Rider	Full-time Rider	Total Food Rider	Percentage of Total Food Rider (%)
< 1 year	40	8	48	48
1-2 years	28	9	37	37
2-3 years	7	3	10	10
> 3 years	2	3	5	5
	77	23	100	100

n=100

Source: Primary Survey, 2021

Due to this new trend, it can be discovered from the analysis that the needs of the society, particularly food deliverer, for a proper working condition, the facilities for food delivery framework have not yet planned and provided in Wangsa Maju since it is an emerging trend in urban management. From the thematic analysis, there are three themes of challenges which are (i) no waiting and resting area, (ii) inadequate and unavailability of parking spaces, and (iii) delivery location issue. These challenges should be taken seriously as they are significant in enhancing urban management.

Relating to the SOP during MCO period, food deliverers also do not have place to pray since all religious facilities need to be closed down, alongside with the place to eat and rest since all dine-in areas are prohibited. Consequently, causing the food deliverer to impede other road users in the commercial area and high-rise building, which will lead to traffic jammed and the rise of illegal parking in commercial areas. This supports the statement of Suryanarayanan (2018), in which it is referring to the infrastructure for delivery motorbikes is not yet in place, the entire part of pedestrian walkway and stretches of road, are dominated by them.

Other than that, it can be found that large proportion of the food deliverers have experienced difficulties in locating the consumer's delivery point, which can be perceived that most of the food deliverers took five to ten minutes to locate a single delivery point. Furthermore, technical errors in the food delivery platform apps is the main factor that contribute to the difficulties in locating consumer's delivery point after security and residential layout. 98% of the food delivery staff used digital maps or navigation apps to assist them in locating the consumer's delivery point. However useful it is, it still remains effective as according to one of the respondents, there are some cases the apps are not updated to the current geographical location of the area. Apart from that, Food Panda and Grab Food have provided SOP whenever any technical issue regarding the food platform app and navigation app arises. Some of the SOPs are:

i. SOP when the customer could not be contacted.
ii. SOP pertaining to delivery platform apps and navigation apps.
iii. SOP when restaurants and customers pinned wrong location on the digital map.

Table 4: Relative Important Index of Factors that Contribute to the Delay in Deliveries

Factors that Contribute to the Delay in Deliveries	Frequency of Respondent				Relative Importance Index (RII)	Rank
	1	2	3	4		
Restaurant	0	3	21	76	0.9325	1
Weather	3	17	47	33	0.775	2
Traffic	13	25	37	25	0.685	3

n=100

Source: Primary Survey, 2021

From Table 4, it shows that restaurant factor is the strongest factor in contributing to the delay in deliveries, after weather and traffic aspect respectively. Restaurant is one of the nodes in the distribution structure of food delivery service, since they are involved in the food preparing and packaging. Accordingly, restaurants play a vital role in the frameworks of food delivery service. Based on the survey, the average duration that restaurant took for food preparation is within 11 to 30 minutes, which most of the food deliverer criticized on the unproductive management process. This demonstrates the necessity of collaboration planning in ensuring the delivery service's quality is met. According to Fancello *et al* (2017), the logistic activities of food delivery service are complex and involved many stakeholders. Last-mile delivery, particularly food delivery, puts a focus on management with the goal of increasing efficiency (Olsson, Hellstrom, & Palsson, 2019).

Furthermore, in logistics context, service area for food delivery in Wangsa Maju comprises the whole area which benefitted towards the population of the area during the MCO period. To bring more restaurants and businesses closer to its consumers, Grab Food's delivery service radius starts at 10 kilometers from the food outlet location as seen in Figure 1. While for Food Panda, they recently launched extra mile delivery, which widens the delivery radius from three to eight kilometers from the delivery address as per Figure 2. From the delivery radius analysis, it can be seen that the restaurants in Wangsa Maju (based on Respondents' Restaurant Point) that have partnered with Grab Food and Food Panda, can reach all the customer segments in Wangsa Maju.

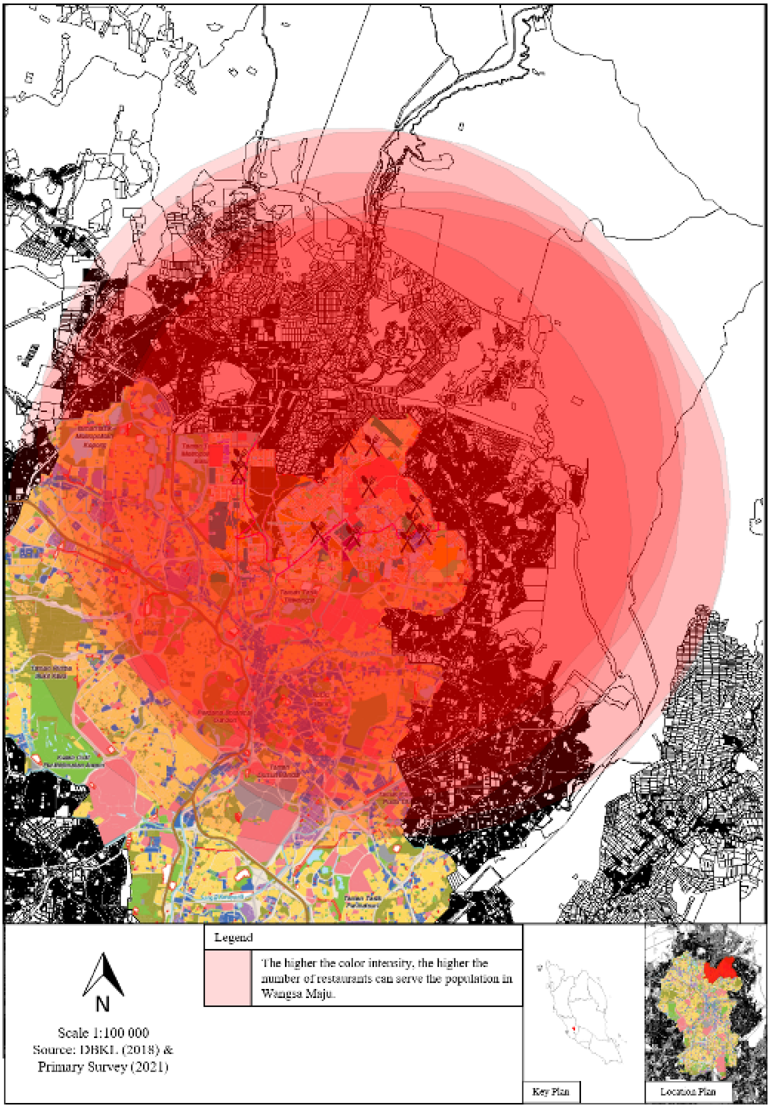

Figure 1: 10 km Delivery Radius
Source: Dewan Bandaraya Kuala Lumpur (2018)

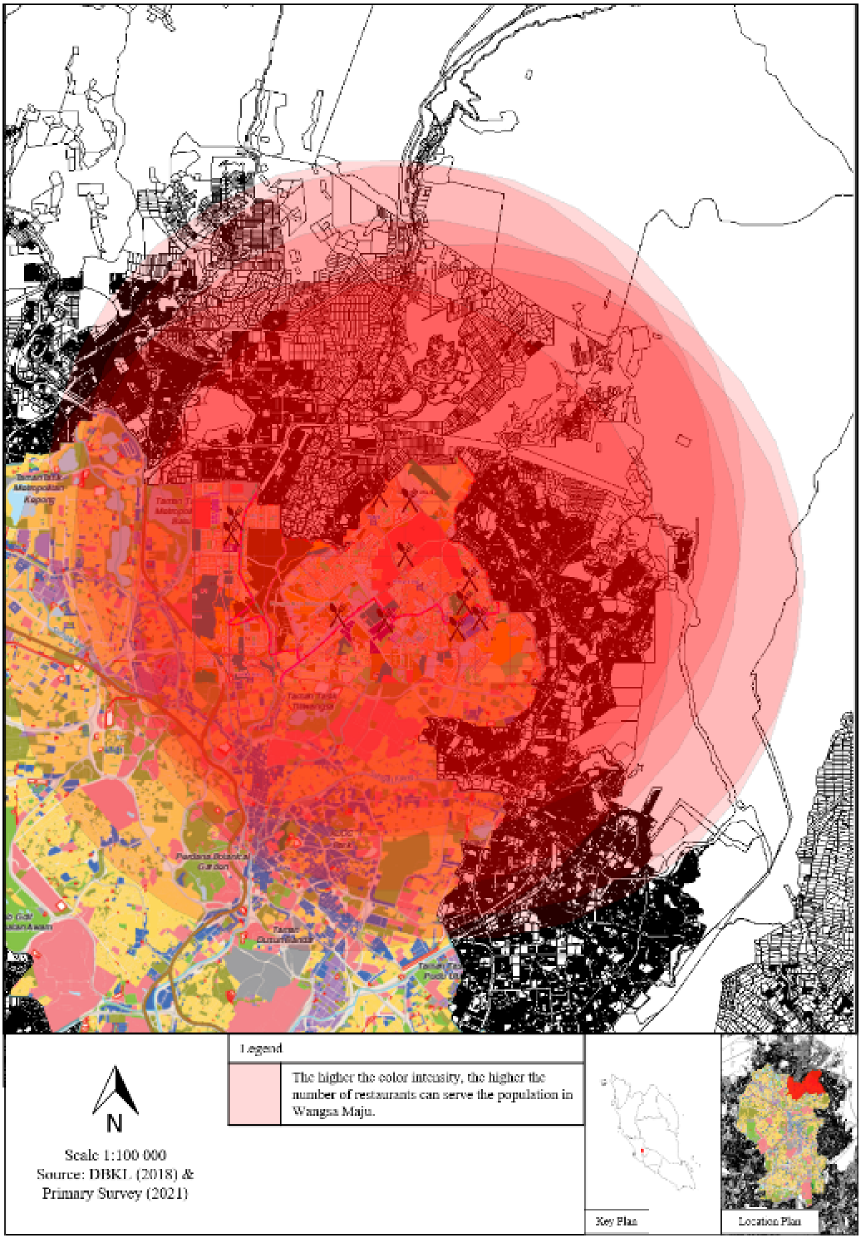

Figure 2: 8 km Delivery Radius
Source: Dewan Bandaraya Kuala Lumpur (2018)

CONCLUSION

Food delivery service is closely related to the urban planning since the frameworks utilise the infrastructures and facilities served by the cities. With a few limitations that need to be considered, a number of possible future studies using the same experimental set up are apparent. This study is carried out in the span of eight months' time. The output and recommendation can be improved through an extended timeframe of the study. The study is also conducted during the COVID-19 outbreak which to some extent may affect the output of the findings and analysis. Therefore, in continuation of further research, it is suggested that research shall be done to plan for the delivery route, as the research finds that the delivery route planning is essential to meet the consumer demand, which is to achieve short order response time. It is also suggested to investigate the needs and levels of expectation of each stakeholder involved in the food delivery service framework. For the managerial position and decision makers, as food delivery services entail numerous logistical operations, each of which is performed by a separate organisation, is advised that each entity work together to maintain the efficiency of food delivery service. Other than that, it is suggested for urban planner to establish a comprehensive planning guideline to cater the needs of food delivery service to be published which includes providing for food deliverer's temporary aid in hotspot area, enhancing the parking facilities for food deliverers, and last but not least maintaining proper infrastructure, such as road and pedestrian walkway. This study proves that human interaction and communication are important to determine the quality delivery services. If the facilities and logistics are planned from the outset by relevant authorities and the delivery staff are well-treated, it will ease the quality of delivery service and ensuring the safety within the COVID-19 pandemic period and MCO.

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Success Determinants of Open Innovation Partnerships between Car Manufacturers and Start-Ups in Germany

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ABSTRACT

In a context of saturated markets, increasing price pressure, growing competition, changing preferences and consumption patterns, the automotive industry is evolving into a diversified mobility industry. This disruptive transformation challenges German car manufacturers to reinvent themselves and innovate in diverse directions. Since loose open-innovation (OI) partnerships with start-ups offer manufacturers not only flexibility but, more importantly, cutting-edge expertise from outside the traditional industry, they have become the partner of choice since 2010. Although incumbent-start-up partnerships are on the rise, the current literature scarcely addresses the challenges that arise from innovation cooperation with such disparate partners. Therefore, this study attempts to identify the success determinants to provide practitioners with guidance and contribute to close current gaps in literature. Based on a qualitative research design, in form of semi-structured expert interviews, key barriers and drivers concerning leadership, work methods, culture and intellectual property were identified. Considering the start-up´s, the incumbent´s and the interface´s perspectives, the paper provides a conceptual framework that illustrates the interrelations and challenges in open innovation partnerships. The start-up´s group expertise and maturity turned out to be a major driver for *initiating collaboration. The key collaborative success drivers are agile work methods, the group´s internal cultural transformation, the interface´s autonomy, and a solid level of trust and openness between the involved parties. Besides practical recommendations, derived by the identified success factors, the paper constitutes a theoretical basis for further research.*

Keywords: *open innovation, start-up partnerships, automotive industry, innovation management*

INTRODUCTION

Today, the automotive industry is undergoing an unprecedented transformation. As the change of mobility is progressing faster than ever - driven especially by digitisation (VDA, 2019), Original Equipment Manufacturers (OEMs) are forced to reinvent themselves in ever shorter periods of time. Due to growing customer demands for eco-friendly driving systems, sophisticated entertainment, driving assistance and mobility services, car manufacturers find themselves in a race for innovation. Moreover, as connectivity and autonomous driving are predicted to play an important role in future mobility, the industry faces a shift in value pools dominated by growing significance of electronics, IT and software (McKinsey&Company, 2019). Since competencies that so far have been less important became success drivers, OEMs are also put under pressure by the lack of specialised personnel (Homfeldt, Rese, Brenner, Baler, & Schäfer, 2017). In consequence, carmakers are increasingly opening corporate borders to react to the market´s dynamic and increase their innovativeness by integrating external expertise (Wilhelm & Dolfsma, 2019). Since the blurring of product and service as well as online and analogue, industry boundaries are dissolving. The combination of strong internal R&D capabilities and integration of external expertise allows companies to react to these challenges for various reasons: It facilitates large corporations to connect to their customers. Further, it enables the access to state-of-the-art technologies as well as specialist knowledge. Moreover, OI allows groups to innovate in diverse directions since it reduces cost and time resources for development. Thus, companies can develop a competitive advantage as OI reduces the time to market. Further, scientific research has empirically confirmed that collaborative innovations are more likely to have technical significance and commercial success (Borges & Kaminski, 2019). Due to this, OI is increasingly perceived as a fundamental component of a contemporary, futureproof innovation management across industries (McKinsey&Company, 2019).

However, only since 2010 German OEMs have become more involved in OI in order to address the immense innovation pressure resulting from the industry´s shift towards a diversified mobility sector (McKinsey&Company, 2019). As a result, automakers engage in more dynamic collaborations with smaller companies and entrepreneurs. Start-up collaborations in particular are perceived in playing a vital role in the manufacturer´s defence of their market leading positions. Today, they have become desirable innovation partners to OEMs as they are a major source of radical innovations (Spender, 2017; Gimenez-Fernandez & Beukel, 2017; Hogenhuis, van den Hende, & Hultnik, 2016). Daimler, Volkswagen and BMW thus established corporate accelerators, incubators and innovation platforms to simplify the interaction with start-ups (Neumann, 2019). However, they struggle to exploit the potential (Wilhelm & Dolfsma, 2019). The failure rate of incumbent-start-up partnerships is relatively high as 'in too many cases, open innovation between large firms and start-ups is ending up nowhere' (Usman & Vanhaverbeke, 2017, p. 172). In case of German automakers, this weakness reinforces the 'closely integrated and in-house driven approach to vehicle development, enabled by close, two-interaction with suppliers over a long cycle' (Hertenstein & Williamson, 2018, p. 46). The rise in innovator platforms initiated by German OEMs represent the increase in importance recognised in the group. Surprisingly, this development is not mirrored by current literature. The automotive industry is neglected in OI research and also asymmetric partnerships are currently rarely found. Although singular studies emphasize the challenges of dissimilar partnerships, they fail to identify success determinants. By drawing on the limited evidence available and the collection of primary data through interviews, the paper offers a multi-faceted view of the challenges of asymmetric OI partnerships. The paper contributes to both, academia and practice by providing a conceptual framework that presents the main success determinants.

Literature Review

Open Innovation

The literature review traces the development of traditional innovation management to OI while highlighting the benefits and drawbacks of each of them. The theoretical foundation is presented, providing an overview of the current state of research. Although OI was only introduced by Henry Chesbrough in 2003, it has already become a new paradigm in business practice and increasingly attracts the attention of executives (Brunswicker & Chesbrough, 2018; Chesbrough, 2003). Today, 80 percent of larger companies in the US, Canada and Europe practice OI (Brunswicker & Chesbrough, 2018). Nevertheless, since OI is relatively young, the literature review revealed several research gaps. Asymmetric partnerships are still under researched (Brunswicker & Chesbrough, 2018). This is especially surprising since more than 50 percent of the surveyed larger firms are unsatisfied with the outcome of start-up partnerships as they 'under-delivering on their promise' (Accenture, 2015a, p. 2). Contemporary research observe that start-up-incumbent collaborations struggle to master a partnership as 'in too many cases, open innovation between large firms and start-ups is ending up nowhere' (Usman & Vanhaverbeke, 2017, p. 172). Nevertheless, current research neither reflects this challenge (de Groote & Backmann, 2018; Islam, Buxmann, & Ding, 2017; Hogenhuis, van den Hende, & Hultnik, 2016). Despite the high failure rate, the interest in identifying success drivers is surprisingly low. Throughout OI literature, the search for success determinants is rare. This is caused by the focus on the questions 'why to cooperate?' and 'with whom?' rather than the 'how?' (Agostini & Caviggioli, 2015). As a result, numerous researchers identified potential advantages, drawbacks, antecedents and outcomes but neglected conditions and complexities of transforming potential benefits into actual success (Bormann *et al.*, 2018). However, a few findings offered valuable points of references for subsequent data collection.

Points of Reference

On the one hand, within the few findings on asymmetric partnerships, leadership competence emerged as a key determinant (Hogenhuis, van den

Hende, & Hultnik, 2016; Islam, Buxmann, & Ding, 2017). Since a power imbalance might promote an imbalance in leadership responsibility, the innovation process is endangered by incumbents that govern the innovation process in the desired direction (Islam, Buxmann, & Ding, 2017, p. 1037) or hamper innovativeness through restricted problem solving skills and creativity (Hogenhuis, van den Hende, & Hultnik, 2016). Moreover, work methods were identified to a major hindrance in incumbent-start-up partnerships. In line with the resource-based view, 'complementary resources and knowledge are vital when selecting a partner' (de Groote & Backmann, 2018, p. 2). Therefore, asymmetric partnerships are recognised as a win-win situation since each side has what the other one lacks (Islam, Buxmann, & Ding, 2017; Hogenhuis, van den Hende, & Hultnik, 2016; Wikhamn, 2020). Nevertheless, discrepancies between a start-ups´ agile and entrepreneurial way of working and a groups bureaucratic, strategy-driven, working life which is determined by rigid routines and hierarchies, are observed to be a major hindrance (Gimenez-Fernandez & Beukel, 2017): 'The combination of entrepreneurial activity with corporate ability seems like a perfect match, but elusive to achieve' (Weiblen & Chesbrough, 2015, p. 66). Besides leadership and work methods, culture and its interrelation to organisation is frequently observed as a key success obstacle in asymmetric partnerships, suggesting transferability to the automotive industry (Islam, Buxmann, & Ding, 2017; Hogenhuis, van den Hende, & Hultnik, 2016; Weiblen & Chesbrough, 2015). As car manufacturers increasingly co-creating innovations with start-ups outside the traditional industry, bridging cultural distances is assumed to be even more challenging. After reviewing the current state of the literature, intellectual property (IP) management is also seen as a major obstacle (Wikhamn, 2020). Since traditional industries, like the automotive sector, has long been focusing on strong internal R&D, highest level of confidentiality and patent applications, the fear of losing success-critical IP hampers an effective exchange of knowledge between innovation partners. Coupled with the power imbalance and the mutual dependency, complex challenges arise that impair successful innovation cooperation, according to the few studies conducted to date (Lauritzen & Karafyllia, 2019; Islam, Buxmann, & Ding, 2017).

RESEARCH APPROACH, METHODOLOGY AND DESIGN

Due to the scarcity of current literature, the need to collect primary data arose. Based on the small number of empirical research, an inductive approach is observed as the most appropriate methodology. As qualitative research supports the study´s explorative character, interviews were conducted. The semi-structured character is defined by a guideline that allows respondents to set their own priorities, while still maintaining a certain degree of comparability. Since the majority of OI literature concentrates solely on the incumbents (Gimenez-Fernandez & Beukel, 2017), the study enriches contemporary findings by including start-up employees. In respect to the research purpose and limitations of time and feasibility, the study concentrates on a purposive sampling, implying that interview partners are selected based on their experience and expertise within the specific field of business (Bryman & Bell, 2011). As the data collection requires the involvement of staff at management level, the number of participants is limited according to the restricted access, time and resource constraints. Due to the COVID-19 pandemic, access has become increasingly difficult. Therefore, the sample consists of four experts, three on start-up (S1, S2, S3) and one on manufacturer side (M1). The relatively small sample is critically reflected in terms of transferability and generalisability. To further enhance the finding´s quality, interviews were considered as a social interaction. Due to that, collected data is critically reflected, considering expectations, differences in age, gender or status (Edelbroek, Peters, & Blomme, 2019). The data is collected and explored without a predetermined theoretical or descriptive framework (Saunders, Lewis, & Thorhill, 2016). The thematic analysis is applied to identify common patterns (Bryman & Bell, 2011). As a result, theory emerges from data collection, analysis and interpretation, grounded in the research participants' social reality.

RESEARCH FINDINGS

Figure 1 illustrates the most influential success drivers for asymmetric OI partnerships that emerged from data analysis. In contrary to previous findings, the paper differentiates between the OEM and its interface. The identified success determinants are briefly presented below.

Leadership

Current findings assume that larger companies struggle in transferring policy- or directional power to start-ups which is confirmed by collected data (Islam, Buxmann, & Ding, 2017; Hogenhuis, van den Hende, & Hultnik, 2016). The asymmetry of size is therefore transmitted to an imbalance in power. Both studies that examined the effect of leadership on incumbent-start-up cooperation in greater detail indicate a negative effect by the incumbent´s superiority in managerial power. This assumption, however, builds on different foundations: Whereas Hogenhuis and colleagues (2011) observe the superiority negatively affecting the elaboration and conceptualisation of ideas caused by a shortage in skills, Islam and colleagues (2017) observe fair negotiations to be at risk. In contrast to these findings, none of the participants observed the leadership dominance as a key barrier to cooperation (Hogenhuis, van den Hende, & Hultnik, 2016; Islam, Buxmann, & Ding, 2017). Instead, openness appeared to be the main driving force to support idea elaboration and problem-solving. Derived by the experience of various group collaborations, it turned out to be, above all, as fundamental for successful cooperation, as the entrepreneur states.

‘By openness I mean, if you presenting a company to the outside world, you are always trying to say that you are good, right? Even when there is something bad, you gonna say: We are good, there is no problem, no, it´s good. So, that means, in the end, the start-up does not really know what´s their problem. So, you are asking them: You want an innovation project, for what? They must share honestly: That are the problems we experience, these are the problems that we have. And then, we can find a solution for the problem and solve the problem’ (S3)

This is also evident in the responses of other participants as they primarily reflect the lack in transparency of the group as one of the greatest shortcomings in asymmetric partnerships. In order to contribute to a qualitative, innovative solution, the innovation partners must be enabled to develop a mutual understanding of the manufacturer´s problem, weaknesses, and respective needs.

Work Methods

Hogenhuis' assumption that OEM dominance would hinder effective collaboration due to skills shortages has also been proven wrong for the German automotive sector. Today, the interfaces have already developed into centers of excellence, driven by the employee diversity and a focus to agile and creative work methods that match the start-ups way of thinking and creating innovations.

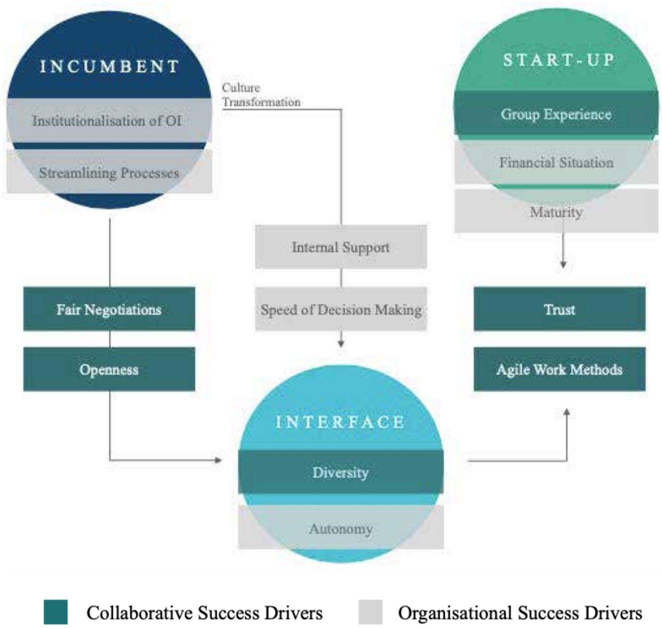

Figure 1: Success Drivers in Innovation Partnerships between Start-ups and German Car Manufacturers (Source by Author)

All respondents highlighted the advantages of agile work methods on which the parties agreed on, right from the beginning of the collaboration. They were consistently recognised for creating an effective and fruitful basement for cooperation as they are 'very goal-oriented, very collaborative, but also very structured' (S1). Their strength was also observed as supporting progress and keeping on track during the time-consuming early stages of cooperation. 'So, from the point of view of working methods, it actually fit together very well. The start-ups are all pretty good in agile decisions anyway, and that fit together very well with the incumbent team' (S1).

Instead of being challenged by adapting to the way the start-up works, the innovation team member emphasized that agile working methods are already established (M1). Potential differences in work methods become invisible and did not determine the process. Thus, the car manufacturer´s innovation teams are already easy to work with from a start-up perspective. Previous research findings of Hogenhuis and colleagues (2016), Weiblen and Chesbrough (2015) and De Groote and Backmann (2020) were not evident in asymmetric partnerships in the German automotive sector. In contrast to Hogenhuis (2016), a successful idea elaboration and innovation conception is not primarily affected by an imbalance in power, but the agreement on agile work methods and the degree of openness towards the cooperation partner which is defined by the incumbent, its attitude to OI and the contractual framework. As Islam and colleagues (2017) stated, an effective cooperation is hampered by unfair negotiations to the detriment of start-ups. The incumbent must be aware of creating a cooperation atmosphere and contractual framework that allow both parties, the interface and the start-up, to share all relevant information. This requires precise rules on IP handling. The participants reflected IP protection as an influential determinant of a cooperation´s success and confirms findings by Usman and Vanhaverbeke (2017):

"This (IP) was indeed one of the main conflicts and also one of the greatest points of discussion on how to settle the whole thing. There were a lot of discussions that were not very productive, and, in the end, we came to the conclusion that, well, nothing has been developed yet, maybe we just leave it at very simple regulations" (S1).

Only Weiblen and Chesbrough (2015) yet provide recommendation on how to deal with that issue: They recommend the incumbent to address the start-ups´ concerns about losing IP with simple regulations, as confirmed in the statement above. Reducing complexity at a very early stage proved to be one of the best ways to limit the negative impact of the trade-off. 'Very simple regulations' result in regulations such as 'whoever brings in something, get the rights to it, and joint developments are then available for the whole cooperation' (S3) as well as 'what we work out for the customer in return for money, belongs to them' (S3). The easiest way to reduce complexity seems to be a conventionally set up, described by the incumbent as 'traditional customer-supplier relationship' (M1). Since IP is the start-up´s main asset (Weiblen & Chesbrough, 2015), fair negotiations are essential to establish a trust-worthy work atmosphere. Trust emerged as one of the most influential success drivers for asymmetric partnerships as it supports the exchange of knowledge and benefits cooperation by bridging organisational distances.

Organisation

Although 'large companies have long sought ways to become more entrepreneurial' (Weiblen & Chesbrough, 2015, p. 68), they are characterised by bureaucratic, strategy-driven, rigid routines and hierarchies that hamper innovativeness since they 'restricts firms from making adjustments changing the way they do things' (Gimenez-Fernandez & Beukel, 2017, p. 22). As OEMs increasingly collaborate with start-ups outside the traditional supply chain, the distance between the parties' working practices is expected to be even more difficult to bridge.

In contrast to previous research, differences in work methods did not emerge as key obstacle since both parties agreed on the application of agile methods. However, there are huge differences between the incumbent and it's interface when it comes to agility and decision-making processes. This is why, Figure 1 differentiates between the OEM and its innovation centre. The slowness of the OEMs decision making processes clearly emerged as a major hindrance to successful asymmetric partnership. Pace was consistently named by every participant, including the innovation department member, as a key barrier for the process, confirming the findings of several studies conducted in the context of asymmetric partnerships (Islam, Buxmann, & Ding, 2017; Usman & Vanhaverbeke, 2017). However, the slowness is caused by cultural and organisational issues rather than a mismatch of working methods. Therefore, the mediating interface still have a long way to go in driving the group´s internal transformation to improve their collaboration capabilities.

'From a start-up point of view, everything takes a long time, it is more likely to take years, many years rather than months, and also independent of how motivated the individual participants from the respective department are. The specific incumbent's team was very interested and pushed the project quite hard, but to implement the whole thing internally, (…) it's a completely different challenge.' (S3)

This statement again highlights the necessity to differentiate between the incumbents and its interface. Although start-ups are aware that ‘working with a group can be difficult, above all, it can be long. That is, I believe, no secret’ (S3), the slowness of decision-making processes, might endanger an entrepreneur’s financial liability due to a start-ups financial restraints. Since the start-up participants repeatedly emphasized challenges caused by slowness, it might be one of the main reasons contributing to the start-ups growing dissatisfaction with incumbent collaborations, accessed by Usman and Vanhaverbeke (2017) and Accenture (2015). Therefore, not only to prove the technological fit and marketability of the start-ups’ asset, it’s maturity should be preventively accessed through scanning and selection mechanisms. Since the maturity as well as financial liability emerged to be key driver in asymmetric partnerships, they are captured in Figure 1. In addition to the financial issues that are caused rigid processes, another success-critical factor is influenced: trust. Since Edelbroek and colleagues (2019) observe a significant and direct interrelation between the perceived quality of the open innovation processes and the participant´s commitment and work efforts, the incumbent should continuously look for ways to simplify and accelerate processes. The corporate environment is detected by Wilhelm and Dolfsma (2019) as not necessarily hinder OI with partners from within the traditional supply chain as these are often conceptualised as buyer-supplier partnerships. In contrast, the incumbent’s organisational and cultural setting cause significant challenges when partnering with companies from outside the conservative network. Since the integration of off-industry expertise will determine the manufacturer´s competitiveness and innovativeness, OEMs must urgently drive forward their cultural transformation and organisational renewal. The necessary cultural transformation is already addressed by the interviewed interface. It sees itself as a company-internal promoter of integrating innovation-friendly structures and work procedures to streamline processes and become more agile in decision-making. In both roles of the interface, the mediating role in the collaboration with the start-up and the internal role as a driver of organisational change, success depends on internal support. The importance attached to OI within the company is therefore directly related to the potential success of OI collaborations. In addition to organisational differences, current literature identifies cultural distances encountered in such partnerships as one of the major obstacles.

Culture

That culture is hampering the co-creation process, especially in asymmetric partnerships, has been assumed in several studies (Islam, Buxmann, & Ding, 2017; Hogenhuis, van den Hende, & Hultnik, 2016; Weiblen & Chesbrough, 2015), suggesting transferability to the automotive industry. Since car manufacturers increasingly co-creating innovations with start-ups outside the traditional industry, bridging cultural distances is assumed to be even more challenging. In line with recent research findings, culture is observed as a hindrance by all start-up participants (Islam, Buxmann, & Ding, 2017). Nevertheless, it is a barrier that can be significantly reduced by experience of working in or with a group and loses considerable importance under these conditions:

'So, in our company we have many years of experience working within a group, and are, therefore, familiar with (…) the structures, with the thinking, with the peculiarities (…) we are not the 20-year-old start-up founders who (…) are then culturally completely shocked and disoriented here, but we understand how the groups function. That has certainly made it easier' (S2).

Knowing the unwritten rules can significantly increase the success of OI cooperation, especially on start-up side:

'In such a group there are certain procedures, if I hold a meeting in a larger group, then there is a certain choreography, a certain generally, valid structuring and organisation of a topic down to individual contributions. (…) There are of course all cultural conditions or cultural attributes that definitely exist in the group and I believe that if you have internalised them and deal with them sensitively, you will be able to get through them more easily than if you are putting your foot in it' (S2).

Although, the statements verify culture to be a main hindrance, participants highlighted those cultural differences were 'not a determining factor for the cooperation' (S1) for start-ups who are experienced in collaborating with groups or familiar to group typical structures. Thereby, findings of Usman and Vanhaverbeke (2017) who detected group experience as a key driver in asymmetric partnerships are confirmed. The incumbent's team member considers the department's diversity as key element in developing a mutual understanding: 'We have a diverse team, and this is also the most important thing in building bridges so that we can cover and absorb different perspectives' (M1). The great expertise is recognised by start-ups as contributing to the team's 'above-average qualification' (S1) and 'professionalism' (S2). These findings confirm the study of Bogers and colleagues that so far received little recognition in the academic debate (Bogers, Foss, & Lyngesie, 2018). Thus, instead of a cultural gap emerging during cooperation, the OEM´s understanding, attitude and aptitude towards digital innovations turned out to be more influential, as the quote illustrates:

'The fact that the structures of the automotive industry (…) are very cumbersome and hostile to innovation in some areas. (…) These are things like: A new technology infrastructure is to be used - it's hard to explain that to the management board of an automotive group. Then there is always the question: Why don't we have all the rights? That is our project. (S3)

That the incumbent´s decision-maker and key stakeholders partly showed a lack in understanding of the digital innovation´s nature and feature, is observed by two of three start-ups. This illustrates once again that OEMs must work above all internally to become more innovation friendly. Consequently, structures must be changed, decision-making processes have to be shortened and new organisational and working cultures have to be lived. The institutionalisation of OI, the streamlining of processes enabled by a cultural transformation are thus illustrated as key success drivers in Figure 1. As the entrepreneur states, OEMs partly lack in an understanding of technologies or innovations. Due to that and the slowness of decision-making processes, the interface´s degree of autonomy is success-determining. As illustrated previously, the financial liability, trust and commitment of the start-up can be endangered in case of a long standstill. Since OEMs must become partners easy to work with, they need to rethink either interface autonomy or the involvement of relevant decision-makers.

CONCLUSION AND RECOMMENDATIONS

In light of the automotive industry´s transformation, OI, especially partnerships with start-ups from outside the traditional industry, became an integral part of a future proof innovation management. Although German OEMs increasingly invest in start-up incubators, platforms and networks, they struggle to exploit the benefits of innovation partnerships (Wilhelm & Dolfsma, 2019). Since literature does not offer sufficient information to explain the high failure rates, the research aimed to investigate key success drivers and barriers, determining an asymmetric partnership's success within the German car manufacturing industry. Based on expert interviews, the paper reveals fair negotiations, trust and openness as key drivers rather than a balance of leadership responsibility. Agile work methods turned out to be a key success driver. Moreover, the corporate interface's diversity was emphasized as supporting innovation conception. In contrast to recent research, a cultural gap emerged as less success critical since it can be effectively reduced by the start-up's group experience, confirming Usman and Vanhaverbeke (2017). Further, the cultural alignment is estimated to result from the interface´s relatively young age as a business department and their openness towards external partners. In contrast to the less determining inter-company effect of culture, the intra-company effect turned out to be the major hindrance to asymmetric partnerships. This paper therefore distinguishes between the incumbent and its interface. Closely linked to the slowness of processes, resulting from a cultural transformation lagging behind and the limited autonomy of the interfaces which constitute another hindrance, financial restraints arose to be a major barrier. IP protection is another key determinant to success. The simplification of IP handing emerges to be a main driver to asymmetric partnerships during the early stages of collaboration, allowing the standardisation of cooperation conditions. With increasing depth of cooperation, however, flexibility was emphasized by all participants to be a fundamental necessity. Based on these findings, implications for both, business practice and further research are derived.

Besides the thematical enhancement the thesis contributes to, it addresses methodological gaps existing in current literature. Since current empirical research is primarily based on case studies, the thesis adds personal insights of practitioners by the qualitative, interview-based research design (Usman & Vanhaverbeke, 2017; Blankesteijn, de Jong, & Bossink, 2019). Rich data contributes to the micro-foundation, since 'insight into employees' perceptions within the open innovation is still lacking' (Edelbroek, Peters, & Blomme, 2019, p. 6). Since research about asymmetric partnerships is usually conducted from the incumbent´s perspective, limitations of previous studies are conquered (Usman & Vanhaverbeke, 2017; de Groote & Backmann, 2018). Due to the practical relevance of the topic, a list of recommendations for practitioners and policy makers is provided. Another drawback of current literature is thereby addressed.

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Financial Behaviour among the Malay Community during COVID-19's Movement Control Order (MCO)

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ABSTRACT

Malaysia is no exception when it comes to the COVID-19's global pandemic. Due to COVID-19's rising active and death cases, the Government imposed the movement control order (MCO) as a preventive measure. As a result, most Malaysians were suffering from financial constraints such as income loss and deficit in cash flow, even though the Government proposed several financial aids and initiatives. This study examined the possible factors that influence financial behaviour among the Malay community during MCO, which underpinned under the theory of planned behaviour (TPB). The data collection method employed in this study was a convenience sampling technique collected from 384 Malay respondents through an online survey. Those data were analysed using structural equation modelling- partial least square (SEM-PLS) with 5000 Bootstrapped samples. Based on a two-tailed test at 0.01 significance level, the findings indicated that perceived behavioural control and financial knowledge were significantly influenced financial behaviour among the Malay community during MCO. However, financial attitude and subjective norm were resulted not significantly influencing financial behaviour. This study embedded significant contribution in two aspects (1) to supports the underpinning theory of planned behaviour (TPB) with the involvement of financial knowledge as a new construct in *influencing the financial behaviour (2) to provide the recent research based on the latest phenomenon, which is the COVID-19 pandemic.*

Keywords: *financial behaviour, financial knowledge, Theory of Planned Behaviour, COVID-19*

INTRODUCTION

An unidentified virus, dubbed as the Novel Coronavirus (COVID-19), emerged from Wuhan, China, in late December 2019. It culminated in a spectacular outbreak and has spread in many cities in China, and later on globally (Wu *et al.*, 2020). As of 30th November 2020, global statistics show 65 million active cases and around 1.5 million death cases. On 30th January 2020, the World Health Organisation (WHO) declared a public health emergency of international concern (PHEIC). Most countries took WHO's advice to implement a lockdown as a precautionary measure and to prevent the virus from spreading even aggressively.

Malaysia is no exception, with the first COVID-19 active case was on 25th January 2020. On 13th March 2020, with the approval of the Malaysia Ruler, Malaysia's Prime Minister announced that the movement control order (MCO) through a national live telecast. The MCO phase started on 18th March 2020, and it continued and changed its phases using COVID-19 daily active cases as its indicators. If the daily cases increase mildly, the phase will vary from MCO to conditional movement control order (CMCO). However, if the cases rise drastically in a particular area, the government will impose an emergency movement control order (EMCO) (Shah *et al.*, 2020).

As a result of the pandemic and MCO implementation, the Malaysian economy is going into a depression. Gross domestic product (GDP) is declining from 0.7% in January 2020 to minus 17.1% in July 2020, and the unemployment rate has risen from 3.3% to 4.6% from March 2020 to August 2020. Hence, financial stimulus package aids initiated by Malaysia's Economic Action Council to ease Malaysians financial burden after getting unemployed or loss of income. One of them is the PRIHATIN package, which offers different pay-out amounts, different categories, and six months' bank moratorium (Shah *et al.*, 2020). Even though PRIHATIN and bank moratorium aided Malaysians, it is still insufficient to reduce the financial burden, especially for individuals with large dependents. Therefore, this incidence made Malaysian forced to change financial behaviour due to restricted or limited income. In addition, it affects those who lost their jobs. In short, this incidence also would raise questions related to Malaysians' financial behaviours, which refer to the distinguish of behaviours before and during the pandemic.

In supporting the government's effort to address the problems of the Malaysian income that would be affected by inflation, the main critical issue to be highlighted is financial behaviour. There are three key points highlighted by Ringgit Plus Malaysian Financial Literacy Survey 2020[1]. First, Malaysian's personal finance habits have not changed significantly since 2019, whereby 53% of respondents cannot survive more than three months with their savings. Second, COVID-19 has influenced new norm in financial behaviour such as increased contactless payments, introduction of e-wallet, and online transactions shows shift acceleration. Third, the introduction of loan moratorium that reduced the burden of the impacted group. As far as race is concern, there are ethnic differences in financial vulnerability, with Malay race are being more vulnerable than Indians and Chinese (Abdullah Yusof, 2019). Hence, this will attract the interest for the researchers to conduct the study with Malay is chosen as sample of this study.

The purpose of this paper is to examine the possible factors that influence financial behaviour among Malays, which represents the majority racial population in Malaysia during MCO. The behavioural aspects are taken as consideration of this matter. Several theories associate with behaviour, such as the theory of planned behaviour (TPB) (Ajzen, 1991), the theory of reasoned action (TRA) (Hale *et al.*, 2002), diffusions of innovations (DOI) (Rogers, 2010), etc. Many of the previous studies were applying TPB as a basis for behavioural ethos (Afshar Jalili & Ghaleh, 2020; Balushi *et al.*, 2018; Ganesan *et al.*, 2020; Lajuni *et al.*, 2020; Raut, 2020; Sivaramakrishnan *et al.*, 2017; Sun *et al.*, 2014; Thomas & Subhashree, 2020; Wahab *et al.*, 2016; Widyastuti *et al.*, 2019; Yong *et al.*, 2018). In addition, the previous researchers in their studies also suggested financial knowledge as an additional variable in influencing financial behaviour (Arifin, 2017; Chauhan & Indapurkar, 2020; Deenanath *et al.*, 2019; Grable *et al.*, 2020; Susan & Djajadikerta, 2017). At the time of writing, there are only three recent studies identified related to financial behaviour and COVID-19 from Canhoto (2020), Talwar *et al.* (2020) and Yuesti *et al.* (2020). To nurture this research, therefore, there are three motivations in this study. First, this would become the motivation for the researchers to extend the study using TPB as a theoretical basis. Second, this paper is an extensive study via intervention, whereby the inclusion of financial knowledge would support the existing TPB theory. Third, this paper is focusing on financial behaviour during the COVID-19 pandemic.

Lastly, this paper contributes to the literature in two important ways. First, this paper is to relate the TPB theory with financial knowledge as a new construct. Initially, TPB has derived three main constructs: attitude, subjective norm, and perceived behavioural control (Ajzen, 1991), with the inclusion of financial knowledge adopted from TPB in the future. Second, this paper based on the latest phenomenon, which is the COVID-19 pandemic. This pandemic is categorised under health risk, which influences people's financial behaviour (Grable *et al.*, 2020). Henceforth, these issues have brought the opportunity to make a connection between health and finance.

The rest of the paper is as follows: Section 2 explores literature and explains the construct variables. Section 3 provides details on the methodology. Section 4 presents the results and explains the supported hypothesis. Lastly, the final section concludes the study.

LITERATURE REVIEW

This study focuses on the financial behaviour context, which refers to human behaviours related to money management (Xiao *et al.*, 2011). Widely known financial behaviours include earnings, spending, investing, savings, and protection. Desirable financial behaviour can improve consumer economic well-being, whereas unwanted financial behaviour damages economic well-being. Several studies conducted were related to financial behaviour, e.g. Chauhan and Indapurkar (2020); Raut (2020); Saurabh and Nandan (2018); Serido *et al.* (2020); Sun *et al.* (2014); and Zainul Arifin (2018). Some of the financial behaviour studies are general. Besides, the context of financial behaviour is going depth into specific financial instruments such as the stock market (Sivaramakrishnan *et al.*, 2017), Islamic banking products (Ganesan *et al.*, 2020; Lajuni *et al.*, 2020; Widyastuti *et al.*, 2019; Zinser, 2019), gold investment (Wahab *et al.*, 2016), cash waqf product (Zabri & Mohammed, 2018), etc.

Theory of Planned Behaviour (TPB) by Ajzen (1991) is used as a theoretical basis for this study. This theory purpose is to predict and understand human behaviour. The behaviour determined by intention, and the intention was influenced by three main constructs, which is attitude, subjective norm, and perceived behavioural control. This study includes the additional variable known as financial knowledge, as an extensive study by Arifin (2017); Chauhan and Indapurkar (2020); Deenanath *et al.* (2019); Grable *et al.* (2020); and Susan and Djajadikerta (2017).

Financial Attitude

Black swan events, such as the COVID-19 pandemic, have triggered widespread confusion and fear worldwide (Talwar *et al.*, 2020). This understanding of the financial attitude is even more significant in this study. Financial attitude can be characterised as a psychological tendency when people assess well-established financial management activities with varying acceptability or disapproval (Shim *et al.*, 2009). It can also be categorised as an opinion, a state of mind or a judgement about finance (Zainul Arifin, 2018). Besides, financial attitudes express the person's underlying financial awareness and ability to manage financial transaction decisions.

There are a few possibilities that financial attitude influencing financial behaviour. The better the attitude, the better the behavioural will be (Serido *et al.*, 2020). The inner self develops a financial attitude with a positive belief, mindset, and character regarding money management (Sawitri, 2018; Zhu, 2019). Financial attitude can influence financial behaviour if individuals passionate about finance carry out certain financial activities (Faique *et al.*, 2017). On the other hand, financial attitude can develop and influence financial behaviour through the awareness and injection of cultural value (Kim & Torquati, 2019; Weisfeld-Spolter *et al.*, 2018).

Hence, based on the literature presented, the first hypothesis proposed as follows:

H_1 = Financial attitude is significantly influencing financial behaviour among the Malay community during COVID-19's MCO

Subjective Norm

Subjective norm refers to the perceived social pressure for conducting or not conducting the behaviour (Ajzen, 1991). The social pressure comes from family and peers. Previous studies show subjective norms are influencing financial behaviour (Balushi *et al*., 2018; Raut, 2020; Thomas & Subhashree, 2020; Zabri & Mohammed, 2018). One of the factors is family and friends play an important role in encouraging an individual to perform financial well-being (Thomas & Subhashree, 2020; Zabri & Mohammed, 2018). Besides, an individual will seek opinions related to finance from family, friends, and social media (Balushi *et al*., 2018; Ganesan *et al*., 2020). Hence, the views and feedbacks will encourage positive financial behaviour and good response (Widjaja *et al*., 2020).

Hence, this leads to the following hypothesis statement:

H_2 = Subjective norm is significantly influencing financial behaviour among the Malay community during COVID-19's MCO

Financial Perceived Behavioural Control

Perceived behavioural control is vital as a measurement of behaviour. To some degree, the resources and opportunities available to an individual must determine the probability of behavioural success (Ajzen, 1991). Besides, perceived behavioural control could be looking into another angle, which refers to people's assumption that the behaviour of interest is simple or difficult to execute (Ajzen, 1991). In this study, the resources are money, and the opportunities refer to the ability to make money.

Previous studies show that financial perceived behavioural control significantly influencing financial behaviour (Ganesan *et al*., 2020; Lajuni *et al*., 2020; Sirsch *et al*., 2020; Wahab *et al*., 2016; Zhu, 2019). The more resources and opportunities they possess, the more the ability will increase, leading to the easiness of performing the behaviour (Sivaramakrishnan *et al.*, 2017; Zhu, 2018). Also, the easiness perceptions (Ganesan *et al.*, 2020) and able to make an easy decision (Lajuni *et al.*, 2020) on financial matters by individuals make their ability to control the behaviour become better. Hence, it will increase perceived financial behavioural control and influence good financial behaviour. However, higher perceived behavioural control may discourage impulse financial decisions, facilitate resistance to the desire for immediate gratification, reduce the probability of participation in risky behaviour, and increase an individual's financial behaviour (Sirsch *et al.*, 2020).

Hence, the third hypothesis is postulated as follows:

H_3 = Financial perceived behavioural control is significantly influencing financial behaviour among the Malay community during COVID-19's MCO

Financial Knowledge

The need for financial knowledge is highly regarded as an important variable in influencing financial behaviour (Afshar Jalili & Ghaleh, 2020). Financial knowledge refers to the possession of information and intelligence related to money management matters (Deenanath *et al.,* 2019). Individuals will perform better in financial behaviour because they possess knowledge. They can speak and understand financial terms and financial skills (Grable *et al.*, 2020). To enhance knowledge, individuals need to read financial news and learn from others (Yong *et al.*, 2018).

Previous research found out that financial knowledge is significantly influencing financial behaviour, e.g. Arifin (2017); Grable *et al.* (2020); and Saurabh and Nandan (2018). People can gain financial knowledge through educations and gaining information. They can read some financial books or watching tv shows or videos related to money matters (Mahdzan *et al.*, 2019). Also, financial knowledge will slowly gain from job and life experiences (Deenanath *et al.*, 2019). They can ask educators, financial advisors, and financial institution officers to know more about financial terms and financial products (Tang & Baker, 2016). Hence, the greater the knowledge possessed by an individual, the better financial behaviour.

The following hypothesis propositions are put forward:

H4 = Financial knowledge is significantly influencing financial behaviour among the Malay community during COVID-19's MCO

The proposed conceptual framework developed for this study is based on TPB, as presented in Figure 1.

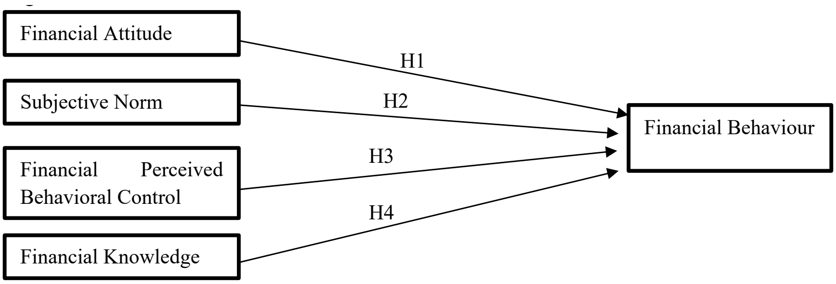

Figure 1: Conceptual Framework

METHODOLOGY

The structural equation modelling- partial least square (SEM-PLS) model evaluates two stages: the first stage is assessing a measurement model, and the second stage is the assessment of the structural model.

Measurement Model Assessment

In the measurement model assessment, the evaluation of reliability and validity is needed for the reflective construct, whereas the formative construct was only required to test validity (Henseler *et al.*, 2009). In this study, the constructs were reflectively measured as the assessments' flow shown in Figure 2, which mean that the latent constructs are measured using several items or indicators.

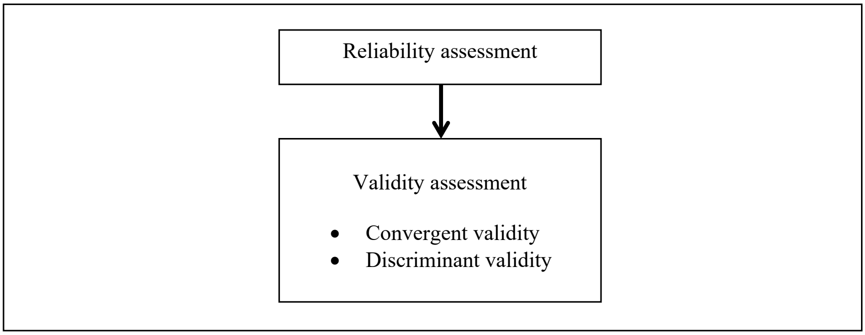

Figure 2: Assessment for Reflective Construct

Structural Model Assessment

In the next step, after analysing the measurement model, the bootstrapping procedure was applied to test the effects and the statistical significance of the parameters in the structural model. Using Smart PLS 3.0 software, the bootstrapping procedure can generate *t*-statistics for significant testing of the hypotheses developed. In this study, 5000 bootstrapped samples adopted as suggested by Hair *et al*. (2019a).

FINDINGS

Respondent's Demographic Profiles

A quantitative strategy is followed here using a descriptive research study approach. Moreover, in this study survey design is used to collect primary data and the sampling method applied was convenience sampling techniques which were taken from indefinite population size to constitute the sample. The pre-testing and pilot study of ten selected respondents within the target population was decided to collect as referring to the suggestion by Cooper *et al*. (2006), in order to assess the reliability and validity of the instrument. Finally, 384 Malay respondents were collected from the questionnaire through an online form and distributed via Bandar Saujana Putra (BSP)'s an official Facebook page. The determination of sample size was based on Krejcie and Morgan (1970) as the maximum sample size to be analysed for the overall population. The highest age categories of the respondent were between 36 to 45 years old. Male represented 54.9% of the sample, while females represented 45.1% of the sample. Respondents with the following Bandar Saujana Putra residence area: SP 1/2/3 15.6%, SP 4/5 30.5%, SP 6/7/8 31.8%, SP 9/10 12.5% and SP 21/ Skypark 9.6%. The general demographic information of the respondents is listed in Table 1.

Table 1: Demographics of the Respondents

Demographic	Information	Frequencies	Percentages (%)
Gender	Male	211	54.9
	Female	173	45.1
Age	16 – 25 years	59	15.4
	26 – 35 years	98	25.5
	36 – 45 years	141	36.7
	46 – 55 years	47	12.2
	56 – 65 years	39	10.2
Education background	SPM	114	29.7
	Diploma	196	25.0
	Degree	143	37.2
	Master/PhD	31	8.1
Marital Status	Single	84	21.9
	Married	295	76.8
	Divorced	5	1.3
Working Status	Self-working	44	11.5
	Public sector	67	17.4
	Private sector	232	60.4
	Not working	32	8.3
	Others	9	2.3
Residence Area (Bandar Saujana Putra)	SP 1/2/3	60	15.6
	SP 4/5	117	30.5
	SP 6/7/8	122	31.8
	SP 9/10	48	12.5
	SP 21/Skypark	37	9.6

Assessment for Measurement Model

First Stage: Reliability Analysis

Cronbach's alpha was traditionally used in assessing the reliability, but Hair *et al.* (2012) suggested using composite reliability (CR) as an alternative for Cronbach's alpha. The previous literature, from Hair *et al.* (2011) and Hair et al. (2010) suggested the threshold value for CR and individual item loadings to be greater than 0.70. It also indicates that the reliability of each item is adequate and gives a consolidation to the latent construct (Ismail *et al*., 2011). From Table 2, all CR values in the range of 0.701 to 0.840. Whereas the items that had factor loadings were in the range of 0.491 to 0.890. The items loading indicates that the value lower than 0.70 (ATB2, FinBehav2, FinBehav3, PBC1, PBC3, SN2, SN3) would be considered for removal. However, the decision for items removal is only allowed if it contributes to the increase in CR value, as Henseler *et al.* (2009) stated. In this situation, all the values of CR well predicted to the reliability adequacy. As a result, it was decided that these items to be kept in the model.

Table 2: Measurement Model

Constructs	Items	Loadings	AVE	CR
Financial Attitude	ATB1	0.799	0.562	0.840
	ATB2	0.433		
	ATB3	0.741		
Subjective Norm	SN1	0.715	0.598	0.702
	SN2	0.588		
	SN3	0.191		
Financial Perceived Behavioural Control	PBC1	0.516	0.508	0.702
	PBC2	0.890		
	PBC3	0.683		
Financial Knowledge	FinKnow1	0.843	0.653	0.792
	FinKnow2	0.867		
	FinKnow3	0.705		
Financial Behaviour	FinBehav1	0.924	0.517	0.701
	FinBehav2	0.454		
	FinBehav3	0.439		

Note:
Average variance extracted (AVE) = (summation of the square of the factor loadings)/ {(summation of the square of factor loadings) + (summation of the error variances)}.
Composite reliability (CR) = (square of the summation of the factor loadings)/ {(square of the summation of the factor loadings) + (square of the summation of the error variances)}.

Second Stage: Validity Analysis

Convergent Validity

Convergent validity is assessing the degree to which multiple items that measure the same concept are in agreement. Factor loadings, CR and AVE, can be used to measure the degree of convergent validity (Hair *et al.*, 2019a) as in Table 1. The additional measurement to be examined is the AVE that reflects the complete amount of variance in the observed variable accounted by the latent variable relative to measurement error (Ramayah *et al.*, 2013). In addition, to measure the AVE need to square the loading of each indicator on a construct then followed by calculate the mean value average (Hair *et al.*, 2019b). Again, from Table 1, the AVE range lies between 0.508 until 0.653 for all constructs, which is higher than the minimum recommended value of 0.50 (Barclay *et al.*, 1995).

Discriminant Validity

In this study, the discriminant validity was determined by using the Heterotrait-Monotrait ratio (HTMT) criterion as Henseler et al. (2015) introduced. The threshold values for HTMT0.90 that have been suggested by Gold *et al.* (2001) and Teo *et al.* (2008) is less than 0.90. However, if Value 1 contains the confidence interval of 0.90, it shows a lack of discriminant validity (Gold *et al.*, 2001). Therefore, Table 3 shown there was no discriminant validity problem existed since all the values were less than 0.90. This result indicated that the construct validity is acceptable, which indicated that the latent construct is truly discriminant to each other.

Table 3: Heterotrait-Monotrait Ratio (HTMT) Test

Constructs	Financial Behaviour	Financial Attitude	Subjective Norm	Financial Perceived Behavioural Control	Financial Knowledge
Financial Behaviour	-				
Financial Attitude	0.802 CI 0.9 [0.736, 0.837]	-			
Subjective Norm	0.860 CI 0.9 [0.819, 0.898]	0.793 CI 0.9 [0.730, 0.847]	-		
Financial Perceived Behavioural Control	0.855 CI 0.9 [0.826, 0.883]	0.786 CI 0.9 [0.737, 0.831]	0.769 CI 0.9 [0.723, 0.812]	-	
Financial Knowledge	0.710 CI 0.9 [0.641, 0.771]	0.889 CI 0.9 [0.858, 0.917]	0.717 CI 0.9 [0.684, 0.778]	0.665 CI 0.9 [0.605, 0.723]	-

Note: Confidence interval used at 90% bootstrap of HTMTinference.

Overall, the assessment for measurement model showed this model is verified to have adequate construct reliability, convergent validity, and discriminant validity. Therefore, Figure 3 illustrates the graphical representation of the measurement model after the PLS algorithm procedure. The results indicate that all the four constructs of financial attitude, subjective norm, financial knowledge and financial perceived behavioural control are all valid measures of their respective constructs.

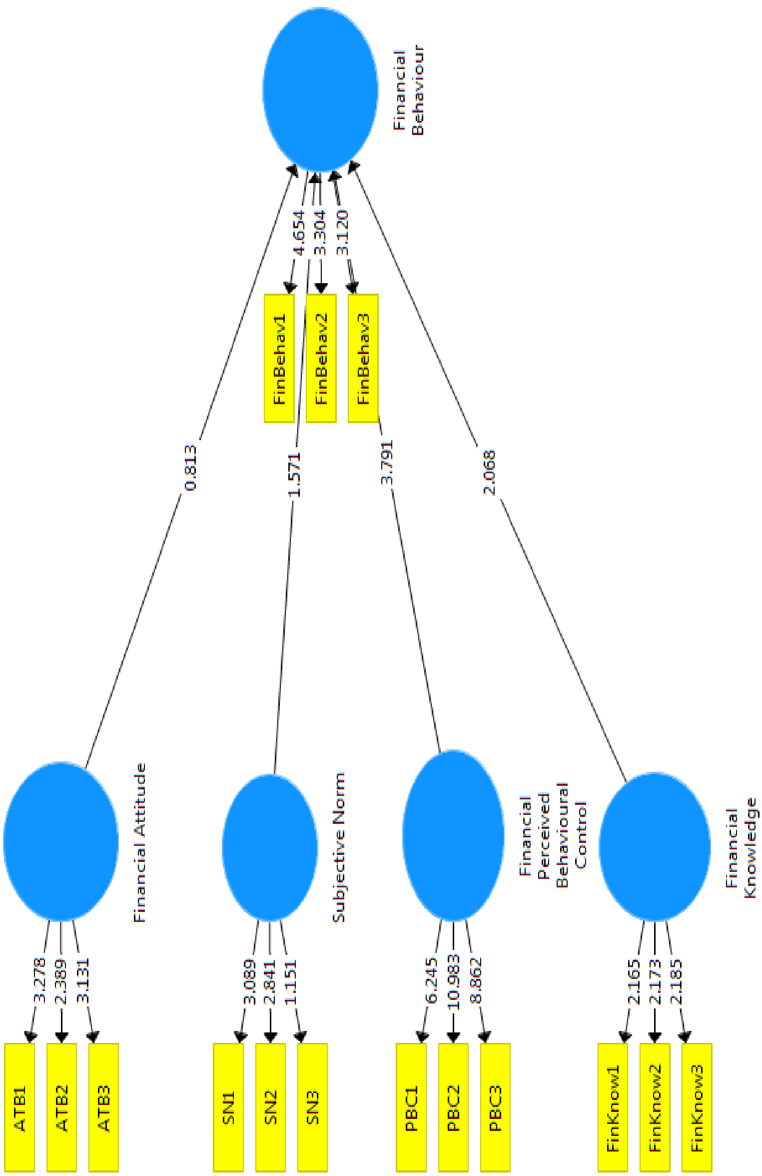

Figure 3: PLS Algorithm Output for Measurement Model Assessment

Assessment for Structural Model

Table 4 presents the path coefficients (β) and their significance values. All the relationships (path coefficients) were significant at *t*-value > 2.58, two-tailed test except for financial attitude towards financial behaviour and subjective norm towards financial attitude.

Table 4: Hypothesis Testing

Hypothesis	Relationship	Sd.Beta	SE	*t*-value	Decision
H_1	Financial Attitude > Financial Behaviour	0.040	0.053	0.761	Not supported
H_2	Subjective Norm > Financial Behaviour	0.080	0.005	1.460	Not supported
H_3	Financial Perceived Behavioural Control > Financial Behaviour	0.371	0.108	3.441	Supported
H_4	Financial Knowledge > Financial Behaviour	0.383	0.167	2.585	Supported

Note: p<0.01 at two tailed test/ t-value>2.58 is considered significant

Hypothesis 1 stated that financial attitude is significantly influencing financial behaviour. This hypothesis is rejected with the *t*-value of 0.761, which is less than 2.58 ($H_1 = 0.761 < 2.58$). Hence, financial attitude does not significantly influence financial behaviour.

Hypothesis 2 stated that subjective norm is significantly influencing financial behaviour. This hypothesis rejected with the *t*-value of 1.460, which is less than 2.58 ($H_2 = 1.460 < 2.58$). Therefore, the subjective norm does not significantly influence financial behaviour.

Hypothesis 3 stated that financial perceived behaviour is significantly influencing financial behaviour. The hypothesis accepted with the *t*-value of 3.441, which is more than 2.58 ($H_3 = 3.441 > 2.58$). Thus, financial perceived behavioural control does significantly influence financial behaviour.

Hypothesis 4 suggested that financial knowledge is significantly influencing financial behaviour. The hypothesis accepted with the *t*-value of

2.585, which is more than 2.58 ($H_4 = 2.585 > 2.85$). Consequently, financial knowledge does significantly influence financial behaviour.

DISCUSSIONS AND CONCLUSION

COVID-19 leaves a significant impact on people, especially in terms of financial well-being and forced them to change their financial behaviour. Hence, the main objective of this paper is to examine the possible factors that influence financial behaviour among the Malay community during MCO. This study uses TPB as the theoretical basis by involving financial knowledge as an additional variable to support the model. PLS-SEM analysis was applied to generate the results and elaborate the findings to meet the study's objectives.

Hypothesis 1, H_1 (financial attitude is significantly influencing financial behaviour) and Hypothesis 2, H_2 (subjective norm is significantly influencing financial behaviour) among the Malay community during MCO shows both hypotheses rejected. In both cases, the Malay community might be concerning or realising to having either a positive or negative attitude as long as they can financially behave in the way they desired. This situation illustrated that the Malay's financial attitude was still under control without affecting their financial behaviour. Regardless of either positive or negative attitudes, they still need to continue their financial obligations, such as paying with credit cards, paying loans, etc. Also, most Malay communities do not believe that the influence of family and peers plays a vital role in practising the desired financial behaviour. Even though past studies suggested that subjective norm is important, but most of the Malay community are independent when it comes to money management. They have certain beliefs that they will be able to survive financially by themselves. Hence, financial attitude and subjective norms are not significant factors influencing the Malay community's financial behaviour during MCO.

Hypothesis 3, H_3 (financial perceived behavioural control is significantly influencing financial behaviour), and Hypothesis 4, H_4 (financial knowledge is significantly influencing financial behaviour) among the Malay community during MCO shows both hypotheses were accepted with a positive magnitude of β. In both cases, the majority of them might be able to control and allocate their spending limit. In this regard, they were might able to differentiate between needs and wants. They could also control their behaviour because of the awareness of the limited budget and spending, especially during MCO. The behaviour is slightly changing, whereby they have the checklist of priority spending. This finding is supported by Lajuni *et al.* (2020), who claimed that anyone who is resourceful, especially with a limited budget, can control their income and spending. This finding is also backed by Sirsch *et al.* (2020), emphasising that different people have their own financial risk, and lower risk has better control than the higher ones. Besides, the Malay community might gain financial knowledge from various sources, such as reading news, bulletins, books related to financial management. They were also referring to some knowledge from social media regarding controlling the credit through Credit Counselling and Management Agency (AKPK) websites or its Facebook page. When it comes to moratorium information, they gain knowledge from Central Bank of Malaysia websites and its Facebook page. This explanation supported by Tang and Baker (2016). Deenanath *et al.* (2019) and Mahdzan *et al.* (2019) supported and claimed that the more financial exposure and financial experience they have, they will gain more knowledge, influencing better financial behaviour. Therefore, the perceived financial behaviour and financial knowledge is a factor in influencing financial behaviour control among the Malay community during MCO.

In terms of managerial implications, the present study provides two suggestions. First, to make financial perceived behavioural control effective, AKPK can develop short advertisements via radio or television. The ad contains awareness and reduces financial anxiety message. The researcher reinforces the claim made by Grable *et al.* (2020) whereby, financial perceived behavioural control will become better if an individual injects some awareness and reduce their anxiety, especially when the pandemic is still ongoing. Besides, the research also suggests that the Ministry of Higher Learning (MOHE), in collaboration with the Central Bank of Malaysia and AKPK, proposes a new subject or new module, Basic Personal Financial Management. In the Malaysian education system, the module is at secondary school Form 3, in Life Skills (Elective). They should start the module earlier than that, perhaps either in Standard 6 or Form 1. Since the result indicated that financial attitude and subjective norm do not influence financial behaviour, it does not mean that the Malay community is not concern about that. Yet, to have better financial behaviour, Malays are encouraged to inject cultural value by looking at how countries behave financially well so that they will learn something about that. On the other hand, the financial behaviour of Malays has the potential to become effective if they seek valuable feedback from family, friends or read more comments and feedback from social media.

This paper provides a theoretical implication. This paper is applying TPB as the theoretical basis, with financial knowledge used as an additional construct. Based on the result, this paper would fill the gap with the significant contribution of financial knowledge guided by TPB theory as an additional construct in gauging the behaviour. Figure 4 presents the validated framework in this study.

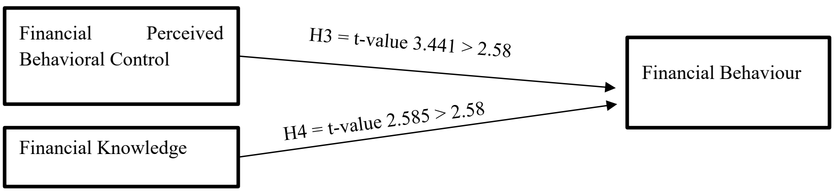

Figure 4: Validated Framework on Financial Behaviour

LIMITATIONS AND FUTURE RESEARCH

Discussions on the literature regarding financial behaviour from COVID-19's MCO are still limited and inadequate. It is due to COVID-19 is perceived as a health risk, and in this study, only financial perceived behavioural control and financial knowledge stimuli the financial behaviour among the Malay community during COVID-19's MCO. Further questions remain unanswered, i.e., how about in the context of the Chinese and Indian community's financial behaviour? To what extent the financial attitude and subjective norm will influence financial behaviour? Is there any test to measure financial knowledge level in influencing financial behaviour? The only more in-depth investigation could provide answers for such questions, which remains a task in the future.

Furthermore, future research suggested adopting different theories or different variables since this study only limits TPB theory. Several base theories are available, such as diffusion of innovation (DOI) and theory of reasoned action (TRA). This suggestion would determine the possibility of financial behaviour in a theory context.

This study is using Krejcie and Morgan (1970) approach in calculating the sample size. Hence, the future research suggested to use GPower analysis recommended by Hair *et al.* (2019a) to better measure the entire population, reduce constraint, improve accuracy and heuristics. Since this study measures HTMT to measure discriminant validity, hence the researcher suggested to use another criterion for further research.

Most of the studies related to financial behaviour are more on the quantitative approach. Hence, there is a need to study via qualitative research. These qualitative data will provide originality and requires in-depth analysis.

NOTES

[1]Full report can be accessed at https://www.fenetwork.my/wp-content/uploads/2020/11/RinggitPlus-Financial-Literacy-Survey-Full-Report.pdf

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An Overview of Efficiency and Profitability in Islamic Banking: A Comparative Study between Islamic Banking and Conventional Banking

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ABSTRACT

Islamic banks are similar to conventional banks, but differ in some practices, financial contracts, and transactions. The functions and transactions of Islamic Banking and Finance (IBF) are based on Sharia principles, which involve risk sharing. Therefore, there is a significant difference in the applications of lending and investment between Islamic and conventional banks. This review paper aims to map IBF- measurement that related to efficiency and profitability issues, by presenting briefly the nature of IBF, including the prohibition of interest and gambling, with the definition of IBF instruments. It reviews the most valuable existing empirical literature that investigated the efficiency and profitability of Islamic banking, which shows that the business model and techniques for measuring performance in Islamic banking does not differ significantly from that of conventional banking. This paper also discusses the critical terms in the financial methods that are used in IBF studies. It is found that the objectives of profit maximisation and cost minimisation are not vital for IBF and the performance of Islamic banks should be evaluated with indication of the level of promoting socio-economic development. Our finding concludes that, the social objectives of Islamic banks can be achieved after adapting new structures, not only for Islamic banks, but also for central banks, and *banking regulations.*

Keywords: *Islamic banking, Islamic finance, efficiency, profitability, financial ratios*

AN INTRODUCTION TO ISLAMIC BANKING AND FINANCE

IBF Development

The development of Islamic banking has established in the four decades. The first experience of Islamic banks was in Egypt in 1963 and 1971 with the establishment of Mith Gharm bank and Nasser Social bank, respectively, the aim of the latter was financing needy people and small businesses. This initial experience drew attentions of policy makers and capitalists, where culminated into launch of Islamic Development Banks (IDB) in 1975, which is the most substantial event in the development of Islamic banking. Since 1970s until 1990s several Islamic financial institutions were established in many Muslim countries. Also in 1990s, the International Monetary Fund (IMF) and the World Bank recognised IBF through publishing working papers according to their impact. In addition, three Muslim countries, Iran, Pakistan and Sudan, replaced gradually interest rates from their entire banking system with Islamic finance models and products (Iqbal & Molyneux, 2005). According to The Banker, since 2006 until 2020 Islamic finance industry has recorded more than 10% a compound annual growth rate worldwide, with $10bn assets in 47 financial institutions (The Banker, 2020).

The Framework of IBF

The fundamentals of Islamic financial transactions aim to evade Sharia-prohibited transactions involving *riba* (*usury*/ interest), *gharar* (the lack of certainty or control in a contract), *misyar* (games of chance) and *qimar* (gambling). Iqbal and Mirakhor (2007) state that the most significant issue in IBF is the prohibition of *riba*, followed by *gharar*, however the other elements have not been discussed as widely as these two. To clarify the definition of *riba*, as a verb, it means to get more than what is given or to be excess in a loan, which is paid back to a lender by a borrower. The fundamental reason for the prohibition of *riba* in Islam is that charging interest is considered to be unfair, enriching the rich (capital lenders) at the expense of the poor (borrowers). However, it should be noted that the meaning of *riba* is not confined to interest on moneylending, as it also applies to other forms of exchange of goods (Iqbal & Molyneux, 2005; Ayub, 2007; Iqbal & Mirakhor, 2007). Sharia clarifies two types of *riba*: *riba al-fadl* and *riba al-nasiah*. *Riba al-fadl* can be defined as dealing with barter exchange of commodities (not goods with money), and it was prohibited since exchanging commodities could incur iniquitous differences in mismatched quantity and quality. *Riba al-nasiah* is based on dealing with money to get more money by previous arrangement, depending on the time and type of interest, characterised today by financial operations in conventional banks (Iqbal & Mirakhor, 2007).

The second significant prohibited component in IBF contracts is *gharar*, which is defined as uncertainty about future possession of the good or service that is provided by one party of a contract, or some features of the subject in the contract are unidentified to the other party (Iqbal & Mirakhor, 2007). In IBF transactions, one of the most vital contractual conditions is risk sharing, which means each party to a contract (especially the financier) must be informed and aware about the level of risk and any possibility of uncertainties that the project or venture might be faced.

Products Offered by IBF

Islamic banks provide a variety of financial services and products, categorised into trade and investment, that constructed on equity participation, Profit-Loss Sharing (PLS) and risk sharing between banks and investor parties. In addition, IBF contracts can be divided into two groups: PLS modes, including *mudarabah* and *musharakah*; and Deferred Sale (DS) or fixed-income contracts, including *murabahah, salam, ijarah*, and *istisna* (Ayub, 2007). These contracts or modes are defined in context below.

Mudarabah (partnership and agreement on profit sharing) is partnership of capital and labour between two parties. The first party (*rab almal*/ financier) provides the funds, and the second party manages and invests the funds on the behalf of the first party, with two conditions: a specific time period and advanced agreement to share the profits according to specified portions at the end of that period. The second party (*mudarib*/ agent) has to have prerequisite competence to undertake the transaction (e.g., substantial experience in financial markets and project management) (Hussien, 2004; Iqbal & Mirakhor, 2007).

Musharakah (equity partnership) is a type of PLS contract which refers to participation between two parties who combine either their capital or labour, to share the profits and losses, with reciprocal rights and liabilities (Iqbal & Mirakhor, 2007). In terms of IBF, according to Hussien (2004) and Toutounchian (2011), *musharakah* can be defined as a contract between an Islamic bank and a profitable company; the bank facilitates working capital. Furthermore, there is an example, namely the application of diminishing *musharakah*, whereby a financer and client contribute either in joint ownership of property or equipment, or the financier's portion is further divided into a certain number of units, and it is agreed that the client will progressively purchase the units of the financer within an agreed period, which increases the client's owned share until all the units of the financer are acquired by the client, who thus becomes the sole owner of the property (Kettell, 2010).

Murabahah (cost-plus-sale contract) can be described as a contract between a financier who purchases goods, and a client who applies for the former to acquire such goods due to lacking the capital to do so; consequently, both of them agree on a profit margin plus the cost to be paid by the client, deferred for a particular period of time. According to the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI), *murabahah* is a pre-agreed profit contract indicating the sale of a product with mark-up on the cost of this product (Kettell, 2010). There are two types of *murabahah* sales: the first type is when a financial institution purchases the product and makes it available for sale to the client without any previous promise from the latter to purchase it. The second type is when the financial institution purchases the product required by the client from another party, to sell this product to the same client. Basically, this type is agreed with a promise that the client has to purchase the products from the financial institution. Along with the concept of *murabahah*, it is often utilised in IBF for mortgages and car purchasing.

Salam (sale with deferred delivery) is defined by Hussien (2004) and Toutounchian (2011) as an agreement with advanced payment on a specific product, between the Islamic bank who makes the agreed payment, and a client who receives the agreed payment and delivers the specified products to the bank at a particular future date.

Ijarah (leasing) is the utilising of *ijarah* contracts, categorised into two types. The first type is the most common contract that relays on usufructs, which means the right to enjoy the use of objects and properties for a certain period. The second type of *ijarah* contract intends to hire a person to perform specific services for an exact time of period with payment of a mutually agreed salary (Kettell, 2010).

Istisna (manufacturing) contract is an agreement between a client or buyer, who demands a project or equipment that requires be manufactured or constructed by a manufacturer, who is the second party of the agreement. Both parties have to agree on specified price and asset that intended to be manufactured (Iqbal & Mirakhor, 2007). In terms of IBF, in this type of contract the role of Islamic bank is that of an intermediary between a client who approaches the bank to finance a new project or building, and a manufacturer or a contractor who constructs the building. Therefore, the bank can earn profits from two parallel contracts: from the contractor making cash payments, and the client who makes deferred payments (Kettell, 2010). In addition, Hussien (2004) indicated that the practice of *istisna* contract is similar to the salam contract, as both of them are DS contracts.

Issue on IBF

It should be noted that the aggregated PLS contracts that are operated in Islamic banks are quite small comparing with fixed-income contracts, owing to their high risky nature of PLS contracts. Islamic banks prefer to operate through fixed-income instruments as a substitute to credit and debt in conventional banks (Ayub, 2007; Ahmed, 2011). Most Islamic banks heavily relied on fixed-income financing, particularly *murabahah* (Alandejani & Asutay, 2017).

Investigating performance in financial institutions have attracted the interest of researchers, bank management, and public policy for the last three decades. Shepherd (1979) described the efficiency as the maximum ratio between output and inputs. In addition, factors that determinant bank profitability are bank-level (internal) factors and macro-level (external) factors. Accounting ratios were the most commonly used index for evaluating bank efficiency and profitability. Since the mid-1990s, more sophisticated parametric and non-parametric methods and techniques have been implemented, as they have better assessment features (Coelli *et al.*, 2005).

The techniques for measuring Islamic banks performance are similar or almost the same to conventional banks. Therefore, this paper aims to map IBF- measurement that related to efficiency and profitability models, showing that the business model in Islamic banking does not differ significantly from that of conventional banking, indeed, the mainstream commercial banking industry is primarily geared toward profit maximisation. However, the objectives of profit maximisation and cost minimisation should not be crucial for Islamic banks, and the performance of Islamic banks should be assessed with indication of the level of promoting socio-economic development. Our finding suggesting that, to fulfil potential social aims, Islamic banks should adjust their structure, which applies not just to Islamic banks' responsibility, but also central banks, regulations, and political conditions; all these factors must be involved to obtain comprehensive measures of performance dimensions and to gauge the achievement of social objectives.

The remainder of this paper is organised as follows. Section 2 presents the literature that explored the performance, efficiency, and profitability. Section 3 provides empirical studies on efficiency and profitability of Islamic banking. Section 4 discusses the critical terms in the financial methods that are used in IBF studies, with shedding the light on Hasan's (2004) point of view. Finally, Section 5 concludes the paper.

Studying Performance, Efficiency, and Profitability

Several studies discussed the conceptual definitions of performance, efficiency, and profitability. Exploring performance in financial institutions is of obvious interest to researchers, bank management, and public policy. Devine *et al.* (1985) were among the first researchers to consider performance measurement of an individual firm and industry perspectives.

In addition, they divided performance measures into profit, productivity, and indirect measures related to market structure, pricing, and investment rules. Productivity measures can be categorised according to levels of sequential activity, affecting the national economy, an industry, a firm, a factory, or a particular production process. Harker and Zenios (2000) considered performance more broadly as a host of financial indicators. Shepherd (1979) defined the efficiency as the maximum possible ratio between output and input variables. Efficiency reflects the maximum output for a given input of resources (Silberston, 1983).

From economies of scale and scope perspectives, large banks are likely to be more efficient. Altunbas and Molyneux (1996) and Girardone *et al.* (2004) stated that large banks conduct more flexible strategies in production and input-output processes, which improve ability to diversity assets and reduce risks, manifesting better management and increase efficiency. Wezel (2010) pointed out that scale efficiency measures a component of technical efficiency related with a bank's ability to produce at its best possible firm size. Scale efficiency represents the situation when the firm produces a certain level of output with a few extra inputs by assuming a constant return to scale.

Berger and Humphrey (1997) investigated 130 studies that applied frontier efficiency to sum up efficiency methods, and located five different kinds of econometrics and statistical methods that were utilised to examine efficiency in financial sector, including data envelopment analysis (DEA), and stochastic frontier analysis (SFA). Also, they indicated that efficiency measurements are different in the distributional assumptions involved with random error and inefficiency (Berger & Humphrey, 1997).

Nonparametric approaches include DEA method, which assume that there are no random errors and that is considered a drawback (Berger & Humphrey, 1997). Delis and Papanikolaou (2009) analysed bank efficiency by utilising a semi-parametric method based on two stages: (1) measuring the input and output variables derived from non-parametric (DEA) approach; and (2) linking the results acquired from the former stage with a series of variables that determine bank efficiency by employing a double bootstrapping process.

The parametric approaches used in the literature includes SFA models. Berger and Mester (2000) indicated that SFA models basically conducted through cost and profit functions, where cost concept signifies to cost minimising, and profit concept signifies to profit maximising. In contrast, the nonparametric approaches do not take into account cost and profit efficiency concepts; they merely consider technical inefficiency by utilising several inputs or providing only a few outputs.

Measuring profitability models were driven form profit maximisation function, which is a method of performance measurements. Shepherd (1979) defined profitability as a natural level of prosperity of the economic firm which is usually associated with profit rate. However, Devine *et al.* (1985) pointed out that profit is an unclear performance indicator from the private and social standpoints. From the perspective of a private business, a high rate of profit is an indication of satisfactory performance, but in terms of the social standpoint, this high rate of profit might indicate unacceptable performance.

Banking literature that aimed to explore profitability utilised profitability ratios, such as Return On Assets (ROA), Return On Equity (ROE) and Net Interest Margin (NIM) (Izhar and Asutay, 2007; Srairi, 2009; Petria *et al.,* 2015; Azad *et al.*, 2019). Factors that determinant bank profitability are categorised into internal and external. Internal or bank-specific factors are associated to financial firm management decisions and policy maker purposes, such as level of liquidity, provisioning policy, and capital adequacy. These factors are usually described by accounting measures, such as capital, overhead, and liquidity ratios, most studies utilise bank size to investigate economies or diseconomies of scale (Athanasoglou *et al.*, 2006). In addition, capital-assets and liquid assets ratios are utilised to measure bank risk. For instance, a high capital-assets ratio implies that transactions are operated very carefully, and as a consequence a bank cannot make high profits because the implicitly conservative investment approach limits access to more opportunities (Goddard *et al.*, 2004). External factors are industry-level or industry-specific, such as concentration ratio, market share, and macroeconomic variables (e.g., inflation, and income per capita). Furthermore, in terms of industry-level variables that are related to industrial structure, literature on bank profitability has examined the persistence of the profit paradigm and structure-conduct-performance (SCP) hypothesis.

Persistence of profit is identified as the performance for members of an industry to perform frequently over or under a benchmark on a constant basic, which can be selected via a performance criterion among the group, or by utilising specific information out of the group (Berger *et al*., 2000). Secondly, the basic SCP paradigm affirms that market concentration, which is evaluated by concentration ratio, positively relates to performance that is identified by profits (Edwards *et al.,* 2006).

SURVEYING EMPIRICAL STUDIES ON EFFICIENCY AND PROFITABILITY IN IBF

Studies of efficiency and profitability are generally focused on the conventional banking system (pertaining to interest rates). Therefore, the methods for measuring Islamic banking performance are similar to conventional banks. Traditionally, accounting ratios were the most commonly used index for evaluating bank efficiency, but more sophisticated methods like DEA and SFA have been increasingly implemented, as they have better assessment features. IBF research has concentrated mostly on theoretical perspectives, with analyses of empirical applications mainly considering descriptive statistics rather than statistical examination (Mokhtar *et al.,* 2007). Performance studies of IBF began in the 2000s, due to the increased proliferation and importance of IBF institutions globally, particularly in the Middle East and Southeast Asia.

Studies on Efficiency

In terms of Malaysian IBF-related studies, Sufian (2006), Kamaruddin *et al.* (2008), and Hadi and Saad (2010) explored the efficiency of both full-fledged Islamic banks and Islamic windows in Malaysia by utilising DEA. Sufian (2006) indicated that data limitations may limit the precision and clarity of their explanation. Kamaruddin *et al.* (2008) covered a longer period (from 1998 to 2004), and concluded that Islamic banks have managed cost efficiency more than profit due to factors of management and economies of scale. Hadi and Saad's (2010) measurements of efficiency in Malaysian banks (applying DEA and the Malmquist Index (MI), found that the performance of domestic Islamic banks is outstandingly better than foreign banks; however, there is a greater number of foreign Islamic banks than their domestic counterparts. Finally, the study suggests that Islamic banks need to use more advanced technology and client services to compete with conventional banks.

In terms of comparative studies, Mokhtar *et al.* (2007) evaluated and compared the cost efficiency of Islamic banks (including Islamic windows) with conventional banks in Malaysia, by utilising DEA and employing several factors, such as variables related to banks' characteristics, to illustrate the determinants of efficiency. The results showed that full-fledged Islamic banks were more efficient than the Islamic windows of conventional banks. On the other hand, IBFs are less efficient than conventional banks, and the Islamic windows of the local banks were less efficient than the Islamic windows of foreign banks. The regression of efficiency determinants reflects that all kinds of efficiency are positively related to bank size, bank age, and capital strength.

Hassan and Hussein (2003) estimated Islamic banks' efficiency by applying SFA and DEA methods, including Malmquist Productivity growth. The results reflected that efficiency and productivity were impaired by decreased level of technology in the banking sector and the political environment. However, they noted the importance of internal organisational issues, stating that Islamic banks need more efficient management and practices.

Hussein (2004) explored the profit efficiency of Islamic vs. conventional banking sectors in Bahrain, utilising SFA with eight Islamic and eight conventional banks. Overall, the findings implied that although many Islamic banks are small and function as venture capital operations, the level of profit efficiency in such banks is similar to conventional investment banks. Another study on Bahrain by Hassan *et al.* (2004) investigated banks' efficiency from 1998 to 2000, from the perspectives of 'overall cost efficiency', 'technical', 'pure technical', 'allocative', and 'scale efficiency'. They also evaluated productivity, by applying DEA. They found that all banks' efficiency levels increased, with the most notable efficiency being achieved by the most cost-efficient bank, Bahrain Islamic Bank, and two foreign firms. They concluded that the main causes of inefficiency in Bahrain's banking sector were 'technical' and 'pure technical' inefficiencies.

Utilising the financial ratio perspective to measure efficiency, Saleh and Zeitun (2007) evaluated the performance of the two largest Islamic banks in Jordan by applying several indicators related to efficiency and profitability. They found that the performance for both banks increased, and both banks contributed in financing significant projects in the Jordanian market. The study indicated that most Islamic bank transactions seem to focus on short-term rather than long-term investments.

A study on two Islamic banks in Pakistan by Siddiqui (2008) aimed to describe the risk of the Islamic finance contract, and investigated the performance of these banks relative to traditional commercial banks, given that both now offer a range of financial services and products. However, the study only covered two years (2003-2004). It utilised standard financial ratios of earnings and profitability capital adequacy, liquidity, and asset composition. The results showed that the studied banks represented a healthy level of performance with respect to returns in assets and equity.

Bashir (2001) investigated the performance of Islamic banks and the relationship between banks' performance and efficiency indicators in 14 Islamic banks in eight Middle Eastern countries. Nonetheless, the study used only financial ratios, divided into internal and external variables to estimate efficiency and profitability. The findings implied that the profitability ratios of Islamic banks are positively related to capital and loan ratios, which determine banks' performance. The results also showed that short-term funding plays a vital role in advancing banks' profit.

Al-Jarrah (2002) examined the efficiency of 82 banks operating in Bahrain, Egypt, Jordan, and Saudi Arabia, by applying SFA to measure cost and profit efficiencies. The author also used DEA to certify the efficiency results acquired from the SFA techniques, including some control and environmental variables (such as bank type, and dummy variables for controlling bank according to country location). The results concluded that Islamic banks appear to be the most cost- and profit-efficient, indicating that the improvements of Islamic banking experiences are able to contribute in advancing the performance of banking systems in Arabian countries. However, Hassan (2006) employed SFA and DEA to investigate cost, profit, and X-efficiency among 43 Islamic banks in 21 countries during the period 1995-2001, and the results presented that Islamic banks are less efficient than counterpart conventional banks.

Viverita and Skully (2007) examined technical efficiency and productivity growth of 21 Islamic banks in 13 countries from the Middle East, North Africa, and Asia over the period 1998-2002 by applying DEA. They concluded that the best technical efficiency improvements occurred in Indonesia, UAE, and the Middle East as a region. Asia was the best-performing region.

Mostafa (2007a, 2007b) measured efficiency by utilising DEA only for the year 2005 in two studies. The first study benchmarked top Arab banks separately, finding that, surprisingly, just eight banks were as efficient as the benchmark in Bahrain, Egypt, Saudi Arabia, Syria, and UAE. The second study of the top 50 GCC banks suggested that the performance of GCC banks requires significant progress. However, these studies were limited to only one year. It would be better for future researchers to employ efficiency method over a longer time period, and other efficiency methods need to be investigated and compared, such as SFA. Al-Muharrami (2007), Johnes *et al.* (2009), and El Moussawi and Obied (2011) also investigated efficiency by applying DEA, using different samples, and consequently arriving at different results.

Al-Muharrami (2007) examined conventional and Islamic banks only in one frontier, for a statistical reason. The findings showed that there was a negative change in efficiency during the studied period, and as technical efficiency decreased, as did total assets, deposits, and loans. Such decreases might be due to provisional impacts during the studied sample period. In contrast, Johnes *et al.* (2009) provided a comparative analysis of efficiency between Islamic and conventional banks. They concluded that: the financial ratios of Islamic banks appear to be less efficient overall, but are more revenue- and profit-efficient than conventional banks; the average efficiency of conventional banks is notably higher than Islamic banks; and Islamic banks are efficient in producing the maximum outputs from orderly inputs, but they are not very efficient in minimising costs. This might be because cost minimisation is not considered a main aim in Islamic banks. El Moussawi and Obied (2011) investigated the technical, allocative, and cost efficiency of Islamic banks. The results indicated that as technical and allocative efficiency decreased, cost efficiency was affected negatively, affirming the earlier findings of Johnes *et al.* (2009). They suggested that future research should apply parametric techniques to improve the investigation of GCC banking performance.

A study on the GCC region by Srairi (2010) investigated cost and alternative profit efficiency of conventional and Islamic banks by utilising SFA. Furthermore, he compared between countries and types of banks, and determined the relation between profit efficiency and cost inefficiency scores. The results concluded that, from a geographical evaluation perspective, Oman had the most efficient banks, while Kuwaiti banks were the least efficient. In terms of bank type, Islamic banks were found to be less cost- and profit-efficient than conventional banks, which the author attributed to several possible reasons, including that the asset sizes of Islamic banks are smaller than those of conventional banks (therefore they lose the advantages of scale economies), and Islamic banks operate at a lower level of risk, which is tied to lower profit efficiency. Ibrahim and Rizvi (2017) noted that larger Islamic banks are more efficient than smaller ones after accomplishing a specific threshold size, which means that bank size plays a vital role in Islamic banks performance and stability, as with conventional banks. Table 1 summarises selected empirical studies on IBF efficiency.

Table 1: Summary of Selected Empirical Studies on Efficiency of IBF

Study	No. of banks	Analysis variables and methods		Country/ region
		Inputs	Outputs	
Hassan and Hussein (2003)	17	Deposits, fixed capital, labour	*Murabaha, mushrahah,* off-balance items	Sudan
Mokhtar *et al.* (2007)	42	Deposits (including saving and *mudarabah* investment deposits and deposits from other banks), labour, expenses	Total earning assets (consisting of loans, dealing securities, investment securities, placements with other banks)	Malaysia
Hassan (2006)	43	Customer and short-term funds, labour, fixed capital	Loans, other earning assets, off-balance sheet items	21 countries
Sufian (2006)	18	Deposits, labour, fixed assets	Loans, income	Malaysia

Mostafa (2007a, 2007b)	85	Assets, capital	Net profit, rate on assets (ROA), rate on equity (ROE)	Selected Arab countries
Bader *et al.* (2008)	80	Total funds, labour, fixed assets	Loans, other earning assets, off-balance sheet items	21 countries
Johnes *et al.* (2009)	69	Deposits and short-term funding, fixed assets, expenses, equity	Loans, other earning assets	GCC countries
Akhtar (2010)	9	Lowest levels of interest expenses	Net interest revenue	Saudi Arabia
Srairi (2010)	71	Physical capital, labour, funds	Loans, other earning assets	GCC countries
El Moussawi and Obied (2011)	23	Deposits, physical capital or fixed assets, labour	Total earning assets, net commissions indicative of off-balance sheet activity	GCC
Alandejani and Asutay (2015)	54	Deposits, short-term funding, equity, operating expenses	Loans, other earning assets	GCC

Studies on Profitability

This section describes the empirical studies exploring the profitability of Islamic banks, whether in a single country or a particular region. In terms of single country, Izhar and Asutay (2007) measured the profitability in *Bank Muamalat Indonesia* (BMI) over the period January 1996 - December 2001, applying bank characteristics and macroeconomic variables, including inflation. They found that financing practices have a significant impact on the profitability of BMI, and that short-term finance activities, such as *murabahah*, play an important role in Islamic banks. While Islamic banking operations can obtain a high level of revenue by *mudarabah*, that requires long-term investment.

Hassan and Bashir (2003) estimated the profitability of 43 Islamic banks from 21 countries, reflecting different levels of economic development and financial structure, over the period 1994-2001. They utilised several internal variables related to bank characteristics, and control for external factors. The results of this study concluded that capital adequacy and loan ratios have a significant affect in determining performance, and short-term funding increases the profits of Islamic banks.

In terms of a regional studies, Srairi (2009) explored internal and external variables that can determine conventional and Islamic banks' profitability in the GCC region from 1999 to 2006. The findings show that the profitability of Islamic banks is affected positively by financial risk (liabilities over total assets). Srairi (2009) suggested that the GCC banking sector should improve their practices and be a liberalising influence, to strengthen financial cooperation among GCC states. Future research should involve more variables that can determine banking profitability (such as business cycle). Furthermore, the short time period of the empirical study could distort the findings, especially in light of the financial crisis of 2008. Table 2 summarises selected empirical studies on IBF profitability.

Table 2: Summary of Selected Empirical Studies on Profitability of IBF

Study	No. of banks	Analysis variables and methods	Country/ region
		Utilised Variables	
Bashir (2003)	14 Islamic banks	• The dependent Variables: Ratios of profit before tax to total assets, net income total assets, and net income to total equity • The independent variables: Bank-level indicators, macro-level indicators, taxation indicators, and financial structure indicators	Eight countries from Middle East
Izhar and Asutay (2007)	Monthly data of *Bank Muamalat Indonesia*	ROA an indicator to profitability, capital ratios, liabilities, expenses, loan and liquidity ratios	Indonesia

Srairi (2009)	48 conventional and 18 Islamic banks	Return on average assets (ROAA) indicated profitability. Internal bank-selected variables: capital adequacy, liquidity, credit risk, financial risk, operational efficiency, and bank size	GCC
Beck *et al.* (2013)	510 including 88 Islamic banks	Financial Indicators: 1. Business orientation (loan-deposit and non-deposit funding ratios) 2. Bank efficiency (overhead cost and cost-income ratios) 3. Assets quality (loss reserves, loan loss provisions and non-performing loans)	22 countries
Trad *et al.* (2017)	78 Islamic banks	• ROA and ROE indicators to profitability, Z-score to measure bankruptcy, total equity to net loans and impaired loans to gross loans ratios to measure credit risk • Control variables: bank-level variables include bank size, capitalisation, liquidity and asset quality, macro-level variables include real gross domestic product, inflation and exchange rates	12 MENA countries
Azad *et al.* (2019)	1991 conventional banks and 608 Islamic banks	Focus on the relationship between loan to deposit ratio, fee and NIM as an indicator to profitability, with controlling the following variables: Lerner index, deposit to asset ratio, efficiency, operating cost, credit risk, risk aversion, log (total assets), non-interest income, opportunity cost, market volatility	20 countries

CRITICAL COMPARISON BETWEEN ISLAMIC BANKING AND CONVENTIONAL BANKING

From the previous part it can be observed that although Islamic banks theoretically differ from conventional banks, particularly in the sense of the PLS paradigm, in practice there is no substantial difference between the two systems. For example, in the assets side of the Islamic bank balance sheet, an insignificant percentage of financing is based on PLS contracts (Chong & Liu 2009). The poor application of PLS contracts in Islamic banks could be attributed to several causes. First, PLS financing requires additional monitoring, which adds more costs to the financial institution. Second, from the borrower or entrepreneur side, PLS contracts are more associated with the lack of management and control, which makes those contracts more vulnerable to risk, thus increasing the hazard rate (Chong & Liu 2009; Alandejani & Asutay 2017).

In relation to applied methods presented in the previous section, IBFs (as with conventional banks) use several methods to evaluate performance efficiency and profitability, including financial ratios, and parametric and nonparametric tests; the question is which of these methods is more appropriate to estimate and address IBF performance, given that IBFs are purportedly different from conventional financial institutions due to their fundamental social objectives. To clarify the answer of this question, Hasan (2004) described the techniques and methods utilised in several studies in evaluating and investigating the efficiency of Islamic banking, and analysed whether the selected methods were appropriate given the intentions Islamic banking is purported to espouse. He criticised applying financial ratios to measure efficiency of IBF literature, noting the limitations in utilising mere ratios to evaluate bank efficiency, which might be deceptive, and not conducive to reaching the right conclusions. He also said this approach could be not good enough to elucidate long-run dynamic variables related to business and market developments. Secondly, according to parametric and nonparametric approaches Hasan (2004) indicated that DEA and SFA methods are widely employed to obtain two findings: to approximate efficiency scores by utilising production units or (decision making units); and to explore the correlation between (in) efficiency approximation and other factors, such as size, investment and profits. SFA is usually used to estimate cost efficiency (cost minimisation), and the translog cost function is mostly specified to investigate banking sector efficiency. In addition, to estimate DMU cost efficiency, the maximisation likelihood approach is frequently utilised. Hasan (2004) analysed some econometric methods to evaluate efficiency by Majid *et al.* (2003), and Saaid *et al.* (2003).

Majid *et al.* (2003) investigated the cost efficiency of Malaysian Banking sector by applying translog cost function and exploiting panel data of 34 commercial banks in comparison of two Islamic banks over the period 1993-2000. The results reflected that there were no significant overall differences between the efficiency of Islamic and conventional banks. However, Hasan (2004) argued that the representation of only two Islamic banks in the study rendered the comparison with other selected and grouped banks problematic. He also criticised the use of the sum total cost of the Islamic banks' labour and capital expenses with income distributed to depositors, which is replaced with interest, without sufficient explanation of how labour and capital expenses are estimated individually. Besides, it seems the authors did not take into account Islamic window transactions in conventional commercial banks.

Saaid *et al.* (2003) examined the X-efficiency of Islamic banks in Sudan by applying SFA approach. Hasan (2004) argued that the study did not simplify the exact method utilised in estimating overall cost efficiency, therefore the results appear to be confused. On the other hand, Hasan clarified that the results presented by Saaid *et al.* (2003), with some suitable adjustments, could constructively contribute significantly to Islamic banking literature.

Overall, Hasan (2004) pointed out that the nature of inputs and outputs and the limitations of data caused these studies to suffer from a lack of information, and their salient conclusions remained indistinct. Furthermore, from a social accountabilities perspective, it is noted that the very significant structural issues, aptitude, and environment that Islamic banks purport to envision were rarely discussed in IBF literature (Hasan, 2004). To give more illustration, the objectives of profit maximisation and cost minimisation are not crucial for Islamic banks, and the performance of Islamic banks should be evaluated with indication of the level of promoting socio-economic (i.e., societal) development. However, the manner in which Islamic banks can be evaluated in terms of social impacts when the mainstream commercial banking industry is primarily geared toward profit maximisation remains elusive. In fact, to fulfil potential social aims, Islamic banks should adjust their structure, which applies not just to Islamic banks' responsibility, but also central banks, banking regulations, and political conditions; all these factors must be included to obtain comprehensive measures of performance dimensions and to gauge the achievement of social objectives.

CONCLUSION

The current study presents a concise discussion of the basis of IBF methods that were utilised to evaluate efficiency and profitability. The techniques and approaches for measuring Islamic banking performance are similar or almost the same to conventional banking. Therefore, this paper has intended to map Islamic banking measurement that related to efficiency and profitability models, showing that the business model in Islamic banking does not differ significantly from that of conventional banking; and although conventional banks are more efficient than Islamic banks, the latter have better assets quality and higher capitalisation (Beck *et al.*, 2013). The mainstream commercial banking industry is primarily geared toward profit maximisation. However, the objectives of profit maximisation and cost minimisation should not be crucial for Islamic banks, thus, the performance of Islamic banks should be assessed with indication of the level of promoting socio-economic development. The surveyed literature sections in this study have described in critical terms the financial methods conducted in IBF studies, concluding that the social objectives of Islamic banks can be obtained after adapting new structures not only for Islamic banks, but also for central banks, banking regulations, and other factors of Islamic nations which are related to macroeconomic level and policy makers. To achieve a better evaluation of measuring the efficiency and profitability of Islamic banks, future research should utilise some variables as indications to socio-economic development in more sophisticated empirical techniques, such as an output-input factor of efficiency models to be associated directly with production functions.

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Journal: Zhou, Z. H. (1998). Chinese accounting systems and practices, accounting, *Organisations and Society, 13*(2), 207-24 .

Manuscript submitted to the journal will be initially screened by the editor, to determine its appropriateness. Those considered inappropriate in totality, will be returned to the sender. Only those manuscripts considered appropriate will follow a double blind refereeing process. They will be passed to an editorial board member for appraisal of their value. Additionally, they will be reviewed by an expert in that discipline.