EXAMINING SUSTAINABLE BUSINESS PERFORMANCE DETERMINANTS IN MALAYSIA UPSTREAM PETROLEUM INDUSTRY

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SRIYANTA HADI

A thesis submitted in fulfilment of the
requirements for the award of the degree of
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DEDICATION

To my lovely parents, for endless love and prayers.

To my lovely wife, Renny Susianti, for her companion, love, and prayers.

To my lovely daughters, Anisa and Nadadhia, for their patience, love, and prayers.

This thesis is dedicated to them.

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Assalamu'alaikum warohmatullahi wabarokatuh,

In the Name of Allah—the Most Compassionate, Most Merciful. All praise is for Allah—Lord of all worlds, the Most Compassionate, Most Merciful, Master of the Day of Judgment. You ˹alone˺ we worship and You ˹alone˺ we ask for help. Guide us along the straight path, the path of those You have blessed—not those You are displeased with, or those who are astray.

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ABSTRACT

Sustainable business performance involving financial performance, social performance, and environmental performance has been a significant issue in the last decade. However, most studies in the past focused on financial performance instead of sustainable business performance at large. This is even more significant for the upstream petroleum industry whereby the industry is not only affected by financial performance due to oil price instability but has also been accused of being a major contributor to environmental issues. Nevertheless, the industry plays a very important role in Malaysia as well as worldwide. Hence, identifying determinants that support an effective change to understand sustainable business performance phenomenon is essential. Accordingly, the objectives of this research are: to identify the determinants associated with sustainable business performance, to examine the mediating effect of sustainable business practices and digital organizational culture, and to determine the moderating effect of oil market turbulence on sustainable business performance in the upstream petroleum industry. Guided by the positivist research paradigm, a quantitative research design was opted to examine the proposed research framework employing PLS-SEM statistical method and cross-sectional data. 220 samples are collected through a snowball sampling strategy involving 21 companies in Malaysia upstream petroleum industry. The empirical findings indicate that organizational learning culture positively and significantly influences sustainable business performance both directly and indirectly. Concurrently, indirect positive and significant influence by digital organization culture is channeled through the mediation effect of sustainable business practices. Sustainable business practices effectively mediate the influence of organizational learning culture and digital organizational culture on sustainable business performance. However, the moderation effect of oil market turbulence on the relationship between sustainable business practices and sustainable business performance is not significant. Deploying the Theory of Performance as underpinning theory, this research explains organization learning culture roles in achieving sustainable business performance beside enrichment in the literature on sustainable business performance and also strengthens understanding of organizational learning culture, digital organizational culture, sustainable business practices, and oil market turbulence in a less explored oil and gas research context. This research provides insights to managers and policymakers in their future decision-making endeavors. The research also has highlighted limitations and suggestions for future research.

ABSTRAK

Prestasi perniagaan yang mampan yang melibatkan prestasi kewangan, prestasi sosial, dan prestasi persekitaran telah menjadi isu besar sejak dekad yang lalu. Walau bagaimanapun, kebanyakan kajian pada masa lalu menumpukan pada prestasi kewangan dan bukannya prestasi perniagaan yang mampan pada umumnya. Isu ini lebih ketara lagi bagi industri petroleum di mana industri ini bukan hanya dipengaruhi oleh prestasi kewangan disebabkan ketidakstabilan harga minyak tetapi juga dituduh sebagai penyumbang utama kepada masalah alam sekitar. Walau bagaimanapunn, industri ini memainkan peranan yang sangat penting di Malaysia dan juga di seluruh dunia, maka mengenal pasti penentu yang menyokong perubahan yang berkesan untuk memahami fenomena prestasi perniagaan yang mampan adalah penting. Oleh itu, objektif penyelidikan ini adalah untuk mengenalpasti penentu yang berkaitan dengan prestasi perniagaan yang mampan, menentukan kesan perantaraan amalan perniagaan yang mampan dan budaya organisasi digital terhadap prestasi perniagaan yang mampan dan menentukan kesan penyederhanaan pergolakan pasaran minyak terhadap prestasi perniagaan yang mampan dalam industri petroleum huluan. Berasaskan paradigma penyelidikan positivis, reka bentuk penyelidikan kuantitatif dipilih untuk menguji kerangka penyelidikan yang dibentuk dengan menggunakan kaedah statistik PLS-SEM dan data keratan rentas. 220 sampel dikumpul melalui strategi persampelan bola salji yang membabitkan 21 syarikat di industri petroleum huluan di Malaysia. Dapatan empirikal menunjukkan bahawa budaya pembelajaran organisasi secara positif dan signifikan menentukan prestasi perniagaan yang mampan secara langsung dan tidak langsung. Selain itu, pengaruh positif secara tidak langsung dan signifikan oleh budaya organisasi digital juga didapati mempunyai kesan pengantaraan terhadap amalan perniagaan yang mampan. Perantaraan amalan perniagaan yang mampan atas pengaruh budaya pembelajaran organisasi dan budaya organisasi digital kepada prestasi perniagaan yang mampan juga dikesan. Namun, kesan penyederhanaan pergolakan pasaran minyak terhadap hubungan antara amalan perniagaan mampan dan prestasi perniagaan mampan adalah tidak signifikan. Berasakan Teori Prestasi, penyelidikan ini menerangkan peranan budaya pembelajaran organisasi terhadap prestasi perniagaan yang mampan, selain itu juga memperkaya literatur prestasi perniagaan yang mampan dan juga memperkuat pemahaman tentang budaya pembelajaran organisasi, budaya organisasi digital, amalan perniagaan yang mampan, dan pergolakan pasaran minyak dalam konteks penyelidikan di industri minyak dan gas yang kurang diterokai. Penyelidikan ini memberikan pandangan kepada pengurus dan pembuat polisi dalam usaha membuat keputusan masa depan mereka. Penyelidikan ini juga menunjukkan batasan dan cadangan untuk penyelidikan masa depan.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

AVE	-	Average Variance Extracted
BMI	-	Broad Market Index
BTU	-	British Thermal Unit
CA	-	Cronbach Alpha
CMB	-	Common Method Bias
Capex	-	Capital Expenditure
CB-SEM	-	Component Based-Structural Equation Modeling
CEO	-	Chief Executive Officer
CFA	-	Confirmatory Factor Analysis
CGAP	-	Consultative Group to Assist the Poor
CI	-	Confidence Interval
CIEL	-	Center for International Environmental Law
CMB	-	Common Method Bias
CMV	-	Common Method Variance
CoP	-	Community of Practice
CPA	-	Certified Public Accountant
CR	-	Composite Reliability
CSR	-	Corporate Social Responsibility
DCV	-	Dynamic Capability View
DOC	-	Digital Organizational Culture
DV	-	Dependent Variable
ECI	-	Environmental Condition Indicator
EconPf	-	Economic Performance
EFA	-	Exploratory Factor Analysis
EIA	-	Energy Information Administration
E&P	-	Exploration & Production
EnvPf	-	Environmental Performance
EOR	-	Enhanced Oil Recovery
EPI	-	Environmental Performance Indicator
ERBV	-	Extended Resource-Based View

ERM	-	Enterprise Risk Management
ESIA	-	Environmental and Social Assessment
EU	-	European Union
EUR	-	Euro
EY	-	Ernst & Young
GHG	-	Greenhouse Gas
GMM	-	General Method of Moment
G&G	-	Geology & Geophysics
GTL	-	Gas to Liquid
HR	-	Human Resources
HSE	-	Health, Safety, and Environment
HTMT	-	Heterotrait-Monotrait
IC	-	Intellectual Capital
ICT	-	Information and Communication Technology
IOC	-	International Oil Company
IOR	-	Improved Oil Recovery
IPTC	-	International Petroleum Technology Conference
ISO	-	International Standardization Organization
IT	-	Information Technology
IV	-	Independent Variable
KBD	-	Kilo Barrel per Day
KPA	-	Key Performance Area
KPI	-	Key Performance Indicator
KPMG	-	Klynveld Peat Marwick Goerdeler
KPOC	-	Kebabangan Petroleum Operating Company
LL	-	Lower Level
LM	-	Linear Regression Model
LNG	-	Liquefied Natural Gas
LPG	-	Liquefied Petroleum Gas
LOPC	-	Loss of Primary Containment
MAE	-	Mean Absolute Error
MFI	-	Micro Finance Institution
MPI	-	Management Performance Indicator

MPM	-	Malaysia Petroleoum Management
MPRC	-	Malaysia Petroleum Resources Corporation
NG	-	Natural Gas
NOC	-	National Oil Company
OLC	-	Organizational Learning Culture
OMT	-	Oil Market Turbulence
OPEC	-	Organization of Petroleum Exporting Company
Opex	-	Operating Expenditure
OECD	-	Organization for Economic Co-operation and Development
OGSE	-	Oil and Gas Service Equipment
OPEC	-	Organization of Petroleum Exporting Countries
OPI	-	Operational Performance Indicator
PAC	-	Petroleum Arrangement Contract
PCE	-	Process Cycle Efficiency
PDCA	-	Plan Do Check Act
Ph.D	-	Philosophy Doctor
PIR	-	Profit Investment Ratio
PLC	-	Public Listed Company
PLS	-	Partial Least Square
PTTEP	-	PTT Exploration and Production
PWC	-	Price Waterhouse Cooper
RBV	-	Resources-based View
RDT	-	Resources Dependent Theory
RMK	-	*Rancangan Malaysia Kesebelas*
RMSE	-	Root Mean Square Error
R&D	-	Research & Development
ROI	-	Return on Investment
SBPf	-	Sustainable Business Performance
SBPr	-	Sustainable Business Practices
SE	-	Standard Error
SD	-	Standard Deviation
SEM	-	Structural Equation Modeling
SME	-	Small and Medium Enterprises

SMME	-	Small and Medium-sized Manufacturing Enterprise
S&P	-	Standard & Poor
SPE	-	Society of Petroleum Engineers
SPSS	-	Statistical Package for the Social Science
SocPf	-	Social Performance
TCE	-	Transaction Cost Economic
TQM	-	Total Quality Management
UAE	-	United Arab Emirates
UK	-	United Kingdom
UL	-	Upper Level
USD	-	US Dollar
UTM	-	*Universiti Teknologi Malaysia*
VAF	-	Value Accounted For
VIF	-	Variance Inflated Factor
VIR	-	Value Investment Ratio

LIST OF SYMBOLS

α	-	Cronbach Alpha
β	-	Beta, the coefficient path
c	-	Average of inter-intern covariance
δ	-	Standard Deviation (SD)
Δ	-	difference
N or n	-	Number of data set
ν	-	Average of variance
Σ	-	Sigma (summation)

LIST OF APPENDICES

CHAPTER 1

INTRODUCTION

1.1 Background of the Research

The significance of the upstream petroleum industry or oil and gas industry to the national economy cannot be underestimated. The oil and gas reserves are a valuable asset to generate revenue streams for the nation (Deloitte, 2015; PWC, 2016). Despite its lucrative contribution to economic development (Abdul Jalil, Mat Ghani, & Duasa, 2009; Deloitte, 2015; Mohd Zulkifli, 2010; Shaari, Pei, & Abdul Rahim, 2013; Yin, Eam, & Golam Hassan, 2009), this industry has been a victim of internal and external factors in ensuring the attainment of its performance.

Hence, the issue of sustainable business performance has been a persistent debate in the literature for the past few decades (Banker, Potter, & Srinivasan, 2000; Ghosh & Wu, 2012; Ittner & Larcker, 1998; Lambert, Cooper, & Pagh, 1998; Salameh Salameh, Awwad Alzyadat, & Ahmad Alnsour, 2011). It has evolved from financial performance to non-financial performance (Filios, 1984; Ghosh & Wu, 2012; Kreps, 1962; Spicer, 1978; Sturdivant & Ginter, 1977; Ullmann, 1985). The development of the performance included three dimensions, economic, environmental, and social that were mentioned as the triple bottom line (Elkington, 1994). Recent literature has provided sufficient evidence for the much greater advancement of performance indicators in outlining what it is meant to have achieved a sustainable business performance (Morioka & Carvalho, 2016). While the issue has been gaining momentum among scholars and practitioners (Chiappetta Jabbour et al., 2020; Dhanesh, 2020; Geissdoerfer, Vladimirova, & Evans, 2018; Kantabutra & Ketprapakorn, 2020; Latan et al., 2018; Mojarad, Atashbari, & Tantau, 2018; Raucci & Tarquinio, 2020; Theodoulidis, Diaz, Crotto, & Rancati, 2017), the oil and gas industry has been facing immense criticisms for not being able to uphold its sustainable performance in the recent past (Grasso, 2020). While the nature of oil and gas industry

characteristics are very different from many other heavy industries (George, Siti-Nabiha, Jalaludin, & Abdalla, 2016), its sustainable business performance cannot be seen in the same way as other industries (Cadez & Czerny, 2016; Mojarad et al., 2018). In other industries, the greenhouse gas (GHG) emissions are normally generated due to fuel combustion, but in the upstream petroleum industry, the production process itself contributes to GHG emissions because of the product.

The oil and gas industry value chain includes such exploration and field development (Desai, Pandian, & Vij, 2021; Guo et al., 2019) with massive investment in terms of technology and human capital (Abdulrahman, Masa, & Teng, 2021; F. Bento, Garotti, & Mercado, 2021; Crivellari, Tugnoli, Cozzani, & Macini, 2018; Guo, Zou, Zhang, Bo, & Li, 2020; Mu, Chen, Xu, & Wang, 2020). Nevertheless, the business performance of an oil and gas industry is mainly determined by its ability to manage operations (Bento, 2021). The operational aspects of the oil and gas industry comprise oil well drilling, production, transportation, and storage (F. Bento et al., 2021). Given the nature of the oil and gas business, its performance does not stop solely at financial measurements but extends to non-financial measurements as well (Abreu, Webb, Araújo, & Cavalcante, 2021; World Economic Forum & Accenture, 2017). The recent past literature has indicated that uncontrollable environmental factors have challenged the financial performance and position of players within the oil and gas industry (Hopkins, 2016; Mitchell, Marcel, & Mitchell, 2015) and it has been more influential to upstream petroleum industry (Grasso, 2019; Stoddart, McCurdy, Slawinski, & Collins, 2020).

While sustaining financial position has been a great challenge to the players within the oil and gas industry (Mitchell et al., 2015), strengthening regulations demanding disclosure of non-financial performance comprising environmental and social compliances has created another stream of challenges to the oil and gas industry (Klevnäs, Stern, & Frejova, 2015; Nasiritousi & Bäckstrand, 2019). It posited that sustaining financial performance has already become a great challenge and the addition of non-financial performance measurements has worsened the situation. External factors have given a big pressure on oil and gas industry players to sustain their annual performance (Abreu, Freitas, & Reboucas, 2017; Abreu et al., 2021). The

quest has become an even bigger challenge when the oil and gas industry has to safeguard sustainable business performance to ensure long-term sustainability and also to pay back to the shareholders (Abreu et al., 2021). Although the oil and gas industry has been heavily invested with performance enablers, the challenge of managing and sustaining the performance is continuing (Mitchell et al., 2015) indicating there are unaddressed missing links that needed attention to fix the issue (Grasso, 2019).

With the background described here, hence research on sustainable business performance is essential. Malaysia's upstream petroleum industry context is chosen with some consideration mainly on its uniqueness and importance to the national economy.

1.2 Problem Statement

Sustainable business performance is not merely on economic performance but includes three dimensions, economic or financial performance, social performance, and environmental performance that are known as the triple bottom line (Elkington, 1994; Kantabutra & Ketprapakorn, 2020) The simple division for the three dimensions would recognize as financial performance and non-financial performance. Financial performance is well known from a business perspective but the non-financial performance that was introduced around the 1960s continues to be an interesting discussion topic as well as a research area (Geissdoerfer et al., 2018; Morioka & Carvalho, 2016).

The upstream petroleum industry involves oil and gas exploration and production with many stakeholders. The upstream petroleum industry is a heavy investment industry that operated in harsh areas. According to the Center for International Environmental Law, CIEL (2019), about twenty-five of the world's big oil companies are responsible for nearly 50% of oil and gas production until 2050 resulting from the new expansion of their activities in the next five years that involve about USD 1.4 trillion budget (CIEL, 2019).

Despite the sustainable performance issue, the oil and gas industry is expected to be continuing as a major energy supply until 2050 (EIA, 2020). The financial performance of the industry has been suffering in the last few years (2016-2020) due to the low oil price calamity (Mitchell et al., 2015). Unpredictable oil price fluctuation is a big challenge for the oil and gas industry. This low oil price situation has tremendously changed the way the industry manages the business, especially in managing efficiency (Hadi & Baskaran, 2021).

On top of the financial issue, the oil and gas industry has been stressed by environmental issues such as climate change issue. Oil and gas companies have been accused to contribute carbon emissions that worsen the environment (Grasso, 2019). This situation leads to establishing the upstream petroleum industry's moral responsibility for improving sustainable business performance mainly on environmental performance (Grasso, 2020). The sustainable business performance of oil and gas firms is very much subjected to management practices. The upstream petroleum industry encounters many uncertainties and challenges in both technical and commercial aspects. The oil and gas industry needs to build resilience (F. Bento et al., 2021) and be able to adapt, adopt and utilize the available most robust enabler: digital technology (Martínez-Caro, Cegarra-Navarro, & Alfonso-Ruiz, 2020). Hence, the next quest is how to make the adaption, adoption, and utilization process is effective.

Many research quantitatively investigates the sustainability of business performance determinants. The research used various industry contexts including the oil and gas industry. One research finds a cognitive barrier in integrating sustainability in a performance management system and suggests applying a performance management system to improve sustainability performance (George et al., 2016). An empirical examination reveals that sustainable business performance is very much related to the stakeholders and environmental risk pressure (Abreu et al., 2017, 2021). From an operational perspective, the key performance indicators for sustainable production in the oil and gas sector are suggested (Elhuni & Ahmad, 2017). Supply chain, regulatory, environmental management, and organization factor are determinants for sustainable supply chain management in the oil and gas sector (Gardas, Raut, & Narkhede, 2019). Standalone sustainability reporting, auditor type,

and firm age are the main factors in disseminating sustainability information in the oil and gas industry in the Russian context (Orazalin & Mahmood, 2018). The type of oil company refers to an international or local company that drives the management style that affects the financial and operational efficiencies in the oil and gas industry (Al-Mana, Nawaz, Kamal, & Koç, 2020). A scoping review of resilience in the oil and gas industry context suggests the resilience concept tends to be researched in terms of system capabilities rather than process (F. Bento et al., 2021).

A literature review has been conducted to find any research gap in the subject of sustainable business performance determinants. With regards to the relationship between organizational culture, sustainability, and digitalization, a framework that connects the level of sustainability, organizational culture, and the level of digitalization are suggested (Isensee, Teuteberg, Griese, & Topi, 2020). Organizational learning culture affects organizational performance (Hung, Yang, Lien, McLean, & Kuo, 2010). With the development of digitalization, Martinez-Caro (2020 reveals that digital organization culture supports organizational performance through business digitalization and digital technologies values development. Organizational learning culture mediates the way the empowering leadership affects inbound and outbound open innovation where absorptive capacity takes a role as moderator (Naqshbandi & Tabche, 2018). The influence of big data analytics capability, organization culture, and internal analytics knowledge on firm performance is also examined (Upadhyay & Kumar, 2020). Organizational culture is a mediator between management practice and sustainability awareness (Oriade, Osinaike, Aduhene, & Wang, 2021).

In summary, most studies still focus on firm performance instead of sustainable business performance. The upstream petroleum industry deals very much with huge data, decision making, optimization, various solutions related to digitalization. Different from the common manufacturing business sector, the oil firms are unique where their dependency on the new technology and oil price is very high. Hence, this research quantitatively investigates how organizational learning culture and digital organizational culture support sustainable business performance in the context of Malaysia's upstream petroleum industry.

The upstream petroleum industry is very important to Malaysia (Badeeb, Lean, & Smyth, 2016; Deloitte, 2015) since it has been taking roles in economic development and growth (Zakaria & Shamsuddin, 2017). The roles have been continuing since the early 1970s. Malaysia recognized its contribution and clearly stated in the Rancangan Malaysia Kesebelas, RMK (Government of Malaysia, 2015). The upstream petroleum industry in Malaysia with a total workforce number of 17,350 created more than RM 103.6 Billion in 2014 with annual growth of 5.4% (Department of Statistics Malaysia, 2016). The oil and exploration and production are managed through a production sharing contract (PSC) system (Kamil, Irham, Sunny, & Ristawati, 2019; Kraal, 2019; Rozaini, Mohd Zaki, Sarip, & Abu Hussain, 2016) where oil companies are operators and Malaysia country as the resource owner. Current production 600-700 KBD (US Energy Information Administration, 2021). According to Malaysia Petroleum Management, MPM, about 32 oil companies currently invest in Malaysia. Relevant to the context of this research, those companies are accused to be damaging the environment through GHG emissions.

Within the upstream petroleum industry, the community of practice is applied very well. The community of practice approach for knowledge management systems is the global competition (Venkatraman & Venkatraman, 2018). Positively, the community of practices provides influence for improvement among the organizations within the community of practices society. Working group among the oil firms is expected to provide a conducive environment that is expected to be positive for sustainable business performance improvement. A negative situation may happen when the avenue becomes promoting any difficulties and the hardness of putting the efforts and blowing up the contra-productive. This can be considered as a theoretical gap relevant to the community of practice concept. The worst-case may happen such as agreement among themselves not to do instead of choosing to do. This situation can happen in the context of sustainable business performance. When people focus on financial performance, attention on sustainability can be put aside and left behind, moreover, it requires a big investment. The high cost of putting sustainability efforts will be another factor that may restrict sustainable business performance.

This research finds some practical gaps in the context of the upstream petroleum industry with the observation of the Malaysia upstream petroleum industry. Three practical gaps are described in the following ways.

Firstly, in theory, sustainable business performance comprises economic performance, environmental performance, and social performance (Kantabutra & Ketprapakorn, 2020). In practice, due to several reasons including economic reasons, compliance of sustainable business performance is not achieved. The oil and gas industry faces new challenges that include new technology adoption while struggling with the harsh physical environment (Abreu et al., 2021; Beltrami & Hansen, 2016; Mojarad et al., 2018). On the environmental performance, the upstream petroleum industry has been accused of its contribution to gas emission (Davis, Ahiduzzaman, & Kumar, 2018; D. Wang & Li, 2018; Zang, Zhang, & Wang, 2020).

Secondly, in theory, organizational learning culture influences inbound and outbound innovation (Naqshbandi et al., 2016), therefore efforts for cultivating the organizational learning culture are put in place to boost innovation that supports sustainable business performance. Integration of sustainability into performance management system has been addressed as part of the solution for sustainability issues in the upstream petroleum industry, however, certain cognitive barriers are still present (George et al., 2016). The cognitive barriers include lack of innovation culture for sustainability, top management mindset, and people capability gaps (George et al., 2016). Therefore, organizational learning culture should be emphasized to resolve the issues. Governance or institutional pressure may be relevant to this area (Orazalin & Mahmood, 2018).

Thirdly, in theory, digital organizational culture supports business performance (Martínez-Caro et al., 2020). In practice, the organizational culture takes a major influence on the success of digital transformation (Soule, 2019). Digitalization needs the support of organizational culture (Duerr, Holotiuk, Wagner, Beimborn, & Weitzel, 2018; Hartl & Hess, 2017; Nadkarni & Prügl, 2020). Digital transformation in the upstream petroleum industry is very much relevant to the energy transition that is also related to global environmental issues (Daneeva, Glebova, Daneev, & Zvonova,

2020; Dmitriveskiy, Eremin, & Stolyarov, 2019; Shinkevich, Baygildin, & Vodolazhskaya, 2020; Wirtschaft & Alexander, 2019). Each organization may take a different pathway and partnership for the digitalization journey (Daneeva et al., 2020). In many cases, failure of technology implementation is due to the cultural problem instead of technology (Hoffman & Klepper, 2000). The role of organizational culture is not straightforward, but it is more on the influence on people's mindset change. Hence, the concept of organizational culture indirectly influences the new technology acceptance can be applied. Therefore, the practice of digital organizational culture will be significant when an organization takes the digital transformation journey.

1.3 Research Questions

This research is focusing on sustainable business performance in the context of the upstream petroleum industry with an observation of Malaysia's upstream petroleum industry. The issues of sustainable business performance of the upstream petroleum industry have been strong reasons to conduct this research. There are three focus areas include the determinants of sustainable business performance, the mediating effect between the determinants and sustainable business performance, and the moderation effect. Therefore, the research questions were raised for answering the three areas.

RQ1: What are the determinants of sustainable business performance in the upstream petroleum industry?

RQ2. What mediating effects do sustainable business practices and digital organizational culture have upon sustainable business performance?

RQ3. What moderating effect does oil market turbulence have upon sustainable business performance?

1.4 Research Objectives

Since this research is focusing on sustainable business performance in the context of the upstream petroleum industry with an observation of Malaysia's upstream petroleum industry, the objectives will be relating to the three areas include the determinants of sustainable business performance, the mediating effect between the determinants and sustainable business performance, and the moderation effect. Therefore the research objectives will be confirming the three areas.

RO1. To determine the determinants associated with the sustainable business performance being met in the upstream petroleum industry.

RO2. To determine the mediating effect of sustainable business practices and digital organizational culture on the sustainable business performance in the upstream petroleum industry.

RO3. To determine the moderating effect of oil market turbulence on the sustainable business performance in the upstream petroleum industry.

1.5 Significant of the Research

This research provides theoretical contributions in the field of sustainable production performance, organizational cultures, business practices, and the impact of different environments. This research also provides practical contributions mainly for the oil and gas industry in managing sustainable business performance that includes non-financial performance on top of financial performance.

1.5.1 Significance to Theory

This research contributes to sustainable business performance literature and organizational culture perception in the following ways.

Firstly, this research enriches the current theories on sustainable business performance determinants. This research empirically examines the influence of organizational cultures that include organizational learning culture, and digital organizational culture. This research answers a critical question: do organizational cultures directly or indirectly influence sustainable business performance? This is important because the influence of organizational cultures on business performance is still in debate (Hung et al., 2010; Martínez-Caro et al., 2020; Upadhyay & Kumar, 2020) and measuring organizational cultures and their impact on organization performance is complex (Alfonso, 2018). Specifically, the findings show that organizational culture has direct effects on sustainable performance.

Secondly, the significance of the mediating effect of sustainable business practices is tested also in this research. Sustainable business practices are the center where efforts and innovations are put in place and blended to make improvements. The improvement includes non-financial aspects for delivering sustainable business performance (Abreu et al., 2017, 2021). There is debate on this management practice (Abreu et al., 2021; Chiappetta Jabbour et al., 2020).

Thirdly, we speculate that moderating effects such as oil market turbulence could occur. There is a lot of research on oil price (Espinasa et al., 2017; Prest, 2018) and oil price behavior (Yanagisawa, 2017) but they do not touch on oil market turbulence relevance to sustainable business performance. This research has proved that the oil market turbulence does not give a moderation effect on the relationship between sustainable business practices and sustainable business performance. This is an important finding in the context of the upstream petroleum business in Malaysia. Although some studies have explored the relationship between management practice and firm performance (Schilke, 2014; Wilden, Gudergan, Nielsen, & Lings, 2013), few studies explore the mechanism through which management practice influences performance such as identifying such business practices under different market turbulence (Karna, Richter, & Riesenkampff, 2016).

Finally, this research was undertaken in Malaysia's upstream petroleum industry, therefore permitting generalization of theory for other contexts. The

measures were as vigorous as in previous studies and these research findings could be explained using existing theories. The examination of organizational cultures in the upstream petroleum industry is interesting since this industry has a uniquely dynamic environment due to evolving high technology, heavy investment, sustainability performance pressure, and unpredictable market dynamics. All these factors require strong organizational learning culture and digital organizational culture for maintaining its competitiveness. Additionally, the study of the upstream petroleum industry is important as previous research on organizational learning culture and digital organizational culture mainly focused on other industries, such as manufacturing, IT, and SME (Hung et al., 2010; Isensee et al., 2020; Martínez-Caro et al., 2020; Naqshbandi & Tabche, 2018; Upadhyay & Kumar, 2020).

1.5.2 Significance to Practice

Within the practical areas, the research contributes to policy development, particularly on the part of the governance, through the findings that related to sustainable business performance determinants including the mediation effect of sustainable business practices.

The government agencies to take control since sustainable business practices in each oil company is different. A previous study suggests that strategy, firm size, and industry type act as moderating roles (Latan et al., 2018). Policy and regulation may play in this area (Caldecott, Elizabeth, Cojoianu, Kok, & Pfeiffer, 2016; Eccles, Ioannou, & Serafeim, 2014).

As the community of practices in developing competitive advantage (Dei & van der Walt, 2020), this research provides fundamentals that can be brought into the upstream petroleum community of practice as part of knowledge management (Venkatraman & Venkatraman, 2018). Sooner or later the digital era brings the industry to the use of digital technology as part of business solutions, the important findings with regards to digital organizational culture are interesting topics to be understood by society. This research has been motivated to investigate the practice and

relationship of digital organizational culture and sustainable management practices. Digital technology helps in data acquisition, analysis, and enablers for accuracy and speed that are very relevant to efficiency improvement. Digital organizational culture is necessarily required for the successful adoption and adaption of digital technology. In practice, the level of digital organization culture and efforts to develop it from one company to another is different (Isensee et al., 2020), even there is a possibility that the band of people believe is wide. Measuring the connectivity between digital organizational culture and sustainable business performance will close one of the practice gaps.

Besides digital organization culture, organizational learning culture is absolutely important (Hung et al., 2010; Hussein, Omar, Noordin, Amir, & Ishak, 2016; Škerlavaj et al., 2011; Škerlavaj, Song, & Lee, 2010; Skerlavaj, Stemberger, Skrinjar, & Dimovski, 2007). The importance of organizational learning culture leads to research on its relationship with innovation (Hussein et al., 2016; Naqshbandi & Tabche, 2018). The examination of the connectivity between organizational learning culture with sustainable business performance strengthens the understanding among the industry practitioners for implementing continuous improvement of sustainable business practices including adapting and adopting new technology, methodology, and challenges. Successful sustainable business practices require capable human resources that will be effectively fulfilled when organizational learning culture is in place (Naqshbandi & Jasimuddin, 2018).

Local and multinational oil and gas companies in the context of Malaysia's upstream petroleum industry possibly have a different culture. Community of practices is expected to be the avenue for sharing best practices about corporate strategy relevant to cultural matters. Community of practices may share best practices in performance metrics and the support of organization culture (Aluc, 2017). The forum may also be used to institutionalize organizational culture journeys such as transformation from a compliance culture to a learning culture (Winkler & Fyffe, 2016).

1.6 Scope of the Research

Applying the theory of performance as the underpinning, this research proposed and examined sustainable business performance determinants from the angle of organizational culture in the particular of the digital era. From the literature review, two variables, organizational learning culture, and digital organizational culture were brought into the framework with sustainable business practices variable as a mediator. Considering the moderation theory, oil market turbulence was identified as a moderator variable for the relationship between sustainable business practices and sustainable business performance. The oil price fluctuation was recognized to be relevant to the oil market turbulence. The oil price has been an important factor for the life of the upstream petroleum industry.

The companies in the upstream petroleum industry have been facing sustainability challenges. Solutions toward achieving sustainable business performance include the implementation of digital technology requires many efforts and possibly organizational changes. As the culture has been reported as the constraint in such digitalization journey, this brings the focus of organizational culture taken into this research. This research focus is based on the practical or managerial perspective that addresses sustainable business practices, organizational learning culture, and digital organizational culture within the companies in achieving sustainable business performance. This research was conducted in Malaysia's upstream petroleum industry and data were collected from the practitioners in oil companies and technology providers for oil & gas in Malaysia. This research collected data from December 2020 to February 2021. A quantitative analysis was conducted to test the hypotheses using structural equation modeling (SEM) techniques.

As mentioned previously, the study focused on organizational culture that includes organizational learning culture and digital organizational culture with the mediation of sustainable business practices. The organizational culture dealt with the people within the organization or the industry, therefore the data that gathered were individual respondents, therefore the unit of analysis of this research was the individual respondent or the individual practitioner in Malaysia's upstream petroleum industry.

1.7 Definition of Terms

Table 1.1 Theoretical and operational definition of terms

Construct	**Theoretical Definition**	**Operational Definition**
Sustainable business performance	Triple bottom line outputs [financial performance, environmental performance, and social performance]. (Kantabutra & Ketprakakorn, 2020).	Attain and uphold economic, environmental, and social performance in any circumstance.
Sustainable business practices	Economic, environmental, and social practices (Chen et al., 2019).	Strategic and systematic practices within the organization and possible external collaboration to attain and uphold economic, environmental, and social performance.
Digital organizational culture	A set of shared assumptions and understanding about organization functioning in a digital context (Martinez-Caro et al., 2020). "[digital] organizational culture is defined as the underlying shared values, beliefs, and assumptions that influence how members think, feel and behave [in creating, delivering, and capturing value by employing digital technologies]" (Vito, 2020).	A set of shared values, assumptions, beliefs, ways of interacting, and ways of working that contribute to a unique social and psychological environment of an organization in creating, delivering, and capturing value by employing digital technologies.

Table 1.1 Theoretical and operational definition of terms (continued)

Construct	**Theoretical Definition**	**Operational Definition**
Organizational learning culture	A firm's open innovation performance relies on its ability to explore and exploit knowledge (Naqshbandi et al., 2016). "emphasizes the values, beliefs, and assumptions towards creating collective learning in an organization" (Sorakraikitikul & Siengthai, 2014). "multilevel process where members individually and collectively acquire knowledge by acting together and reflecting together"(Scott, 2011).	A multi-level collective learning process through shared values, thoughts, and actions across the whole organization or company to gain a competitive advantage and support sustainable business performance.
Oil market turbulence	Changes in the context of the oil market that impose instabilities at different levels, including the market level and could be a result of natural, terroristic, economic, or political-related issues. (Adopted from Bhamra et al, 2011).	Unexpected and unpredictable changes in the context of the oil market due to any possible cause that imposes various levels of instabilities in other areas.

1.8 Organization of the Research

This thesis consists of five chapters, starting with Chapter 1 which describes the introduction of the thesis, and ending with Chapter 5 which describes the research conclusions and suggested further research areas. The five chapters have been arranged as such to enable the reader to follow the storyline and end up with an easy and complete understanding.

Chapter 1 contains 8 (eight) sections. Section 1 is a brief research background that justifies this research. Section 2 describes the problem statement completed with theoretical gaps and practical gaps. Section 3 and 4 are elaborating on the research questions and research objectives respectively. Section 5 highlights the significance of the research that is divided into significance to theory and signifies to practice. Section 6 provides the research scope. Section 7 lists the theoretical and operational definitions. Section 8 is the closing of chapter 1 summarizes the organization of the research

Chapter 2 is the literature review for this research. It is started with section 1, an introduction for chapter two that summarizes the content of Chapter 2. Section 2 provides an introduction of the oil and gas industry starting with a brief history petroleum industry followed by industry development and Malaysia's upstream petroleum industry. Section 3 describes the underpinning theory of the research. Section 4 describes the research variables including dependent, independent, mediation, and moderation variable. Section 5 provides discussions on hypothesis development. Section 6 shows the conceptual framework and Section 7 summarizes the content in Chapter 2.

Chapter 3 is the research methodology. It is started with Section 1 that provides an introduction for Chapter 3. Section 2 describes philosophical underpinnings that consist of ontological assumptions, epistemological assumptions, and axiological assumptions. Section 3 describes the research paradigm. Section 4 describes the research methods, section 5 describes the research design, and section 6 explains the variables and measures. Section 7 explains research sampling, section 8 describes data

collection procedures, and is followed by section 9 which describes data analysis procedures. Section 10 describes the structural equation modeling, and section 11 briefs the model assessment. Section 12 describes mediation analysis and section 13 describes moderation analysis. Section 15 summarizes the whole Chapter 3.

Chapter 4 describes the analysis and results. There are 9 sections in Chapter 4. It is started with Section 1 that provides an introduction for Chapter 4. Section 2 discusses the analysis of survey response and data screening, and section 3 discusses the respondent profile. Section 4 shows descriptive statistics, section 5 discusses the common method variance, section 6 discusses structural equation modeling and section 7 explains and discusses hypotheses testing. Section 8 summarizes the hypotheses testing and section 9 summarizes the whole Chapter 4.

Chapter 5 provides discussions of overall the research and conclusion for the data analysis that is reported in Chapter 4. Chapter 5 consists of 6 sections. It is started with Section 1, the introduction for Chapter 5. Section 2 describes the research overview. Section 3 discusses the research findings for all the research objectives. Section 4 provides the implication of the research. Section 5 describes the limitation and suggestions for future research. Section 6 is the research conclusion.

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Appendix A Cover Letter for Data Collection

Universiti Teknologi Malaysia
Jalan Sultan Yahya Petra
54100 Kuala Lumpur, Malaysia
Tel: 03-2615 4100

Our References : UTM.K.55.01.03/13.11/1/4
Date : December 17, 2020

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

REQUEST TO CONDUCT AN ACADEMIC RESEARCH / PERMISSION TO COLLECT DATA

Name	:	**SRIYANTA HADI**
ISID No. / Passport No.	:	**201709M10404 / B1522731**
Matric No.	:	**PBS173011**
Admission Status	:	**Full Time**
Registration Date	:	**9 September 2017**
Medium of Instruction	:	**English**
Programme	:	**Doctor of Philosophy (PhD)**

With regard to the above, this is to certify that **SRIYANTA HADI (PBS173011)** is pursuing **Doctor of Philosophy (PhD)** at Azman Hashim International Business School, Universiti Teknologi Malaysia, Kuala Lumpur.

The student is currently conducting a research under the supervision of Dr. Shathees Baskaran on a title of **EXAMINING SUSTAINABLE BUSINESS PERFORMANCE DETERMINANTS IN MALAYSIA UPSTREAM PETROLEUM INDUSTRY**. In order to fulfill his research requirement, it would be greatly appreciated if you could allow him to distribute questionnaires, conduct an interview and collect data on related topic in your organization.

Data collection will be used for academic purpose only and shall remain confidential and will not be identified in publication or media.

Thank you for your cooperation.

"BERKHIDMAT UNTUK NEGARA"

I, who uphold trust,

AZMAN HASHIM INTERNATIONAL BUSINESS SCHOOL

NORHARYANI BINTI HAMID
Assistant Registrar
Azman Hashim International Business School
Level 10, Menara Razak
UTM Kuala Lumpur
☎ : 03-21805032
✉ : norharyani.kl@utm.my

Appendix B Questionnaire in Google Form

Examining Sustainable Business Performance Determinants In Malaysia Upstream Petroleum Industry

Dear respondents,

My name is Sriyanta Hadi, I am a student in the doctoral program at Universiti Teknologi Malaysia (UTM). This survey is conducted as part of my research on sustainable business performance in the context of Malaysia's upstream petroleum industry. The survey objective is to collect data for academic research purposes.

This survey consists of six sections: Demography, Organizational Learning Culture, Digital Organizational Culture, Sustainable Business Practices, Oil Market Turbulence, and Sustainable Business Performance in three (3) dimensions, economic, environmental, and social performance. There will be fifty-four (54) simple questions including 2 optional short-answer questions for name and contact.

Please be informed that all answers will be treated as confidential and information disclosed in the survey questionnaire will be kept securely in a password-protected computer. In the final research report, the real names of people and companies will remain anonymous and will not be used.

If you prefer to provide the data through a hard copy form, you may contact me at +60199450345.

Thank you for your participation

Sriyanta Hadi
PhD Student
International Business School (IBS)
Universiti Teknologi Malaysia
Kuala Lumpur

Demography

1. Name (optional)

2. Email/Contact number (optional)

3. What is your gender? *

Mark only one oval.

- ◯ Male
- ◯ Female

4. What is your age group? *

Mark only one oval.

- ◯ 21-30 years
- ◯ 31-40 years
- ◯ 41-50 years
- ◯ 51-60 years
- ◯ 60+ years

5. What is your ethnic origin? *

Mark only one oval.

- ◯ White/Caucasian
- ◯ Black/African
- ◯ Asian
- ◯ Hispanic/Latino
- ◯ The Middle-Eastern/Arabic/Northern African

6. What is your highest year (level) of education? *

Mark only one oval.

- ◯ 1-6 (Primary)
- ◯ 7-12 (High School)
- ◯ 13-16 (College/University)
- ◯ 17-22 (Graduate School)
- ◯ (Post Graduate/Master/PhD)

7. What type of company you have been working with? *

Mark only one oval.

- ◯ National Oil Company (NOC)
- ◯ International Oil Company (IOC)
- ◯ International Service Provider
- ◯ Local Service Provider
- ◯ Others

8. What is your department? Pick the closest department below: *

Mark only one oval.

- ◯ Petroleum Engineering
- ◯ Geology and Geophysics (G&G)
- ◯ Operations
- ◯ Maintenance/Reliability
- ◯ Others

9. What is your job title? Pick the closest title: *

Mark only one oval.

- ◯ CEO/VP/General Manager
- ◯ Manager/Team Leader
- ◯ Specialist/Engineer/G&G
- ◯ Technician/Operator
- ◯ Administrative Staff

10. How long have you been working with the industry? *

Mark only one oval.

- ◯ 1-10 years
- ◯ 11-20 years
- ◯ 21-30 years
- ◯ 31-40 years

11. How long have you been working with the company? *

Mark only one oval.

- 1-10 years
- 11-20 years
- 21-30 years
- 31-40 years

12. How long have you been staying in Malaysia?

Mark only one oval.

- 1-10 years
- 11-20 years
- 21-30 years
- More than 30 years

Organizational Learning Culture

Organizational Learning Culture in your company

A multi-level collective learning process through shared values, thoughts, and actions across the whole organization to gain a competitive advantage and support sustainable business performance.

Please rate the extent to which your company has adopted each of the following practices
1. Strongly DISAGREE
2. Partially DISAGREE
3. Neither Agree or Disagree
4. Partially AGREE
5. Fully AGREE

13. 1. In my organization, people are rewarded for learning. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

14. 2. In my organization, people spend time building trust with each other. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

15. 3. In my organization, teams/groups revise their thinking as a result of group discussions or information collected. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

16. 4. My organization makes its lessons learned available to all employees. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

17. 5. In my organization, teams/groups focus both on the group's task and on how well the group is working. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

18. 6. My organization supports employees who take calculated risks. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

19. 7. My organization uses two-way communication regularly, such as suggestion systems, electronic bulletin boards, or town hall/open meetings. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

20. 8. My organization works together with the outside community to meet mutual needs. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

21. 9. In my organization, leaders generally support requests for learning opportunities and training. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

22. 10. In my organization, leaders ensure that the organization's actions are consistent with their values. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

Digital Organizational Culture

Digital Organizational Culture:
A set of shared values, assumptions, beliefs, ways of interacting, and ways of working that contribute to a unique social and psychological environment of an organization or company in creating, delivering, and capturing value by employing digital technologies.

23. 1. In my company, the teams collaborate functionally in the initiatives for digital transformation and relevant innovation *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

24. 2. In my company, there is a clear orientation to digital technology change. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Completely AGREE

25. 3. In my company, the culture of digital innovation and change takes part as a natural process. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Completely AGREE

26. 4. My company shares with the staff the digital strategy, taking into consideration their suggestions. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

27. 5. In my company, my manager provides help, encourages, and supports training including digital technology training to improve performance. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

Sustainable Business Practices

Strategic and systematic practices within the organization or company and possible external collaboration to attain and uphold economic, environmental and social performance.

28. 1. My company prefers environmentally friendly products. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

29. 2. My company improve efficiency, apply lean work processes, reduce waste, and rework. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

30. 3. My company adopts/adapts reuse, recycling, and remanufacturing initiatives. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

31. 4. My company develops/uses new digital and internet-based tools/system/database. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

32. 5. My company upgrade/replace current equipment and technologies with more efficient ones. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

33. 6. My company re-design operation processes to reduce greenhouse gas emission. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

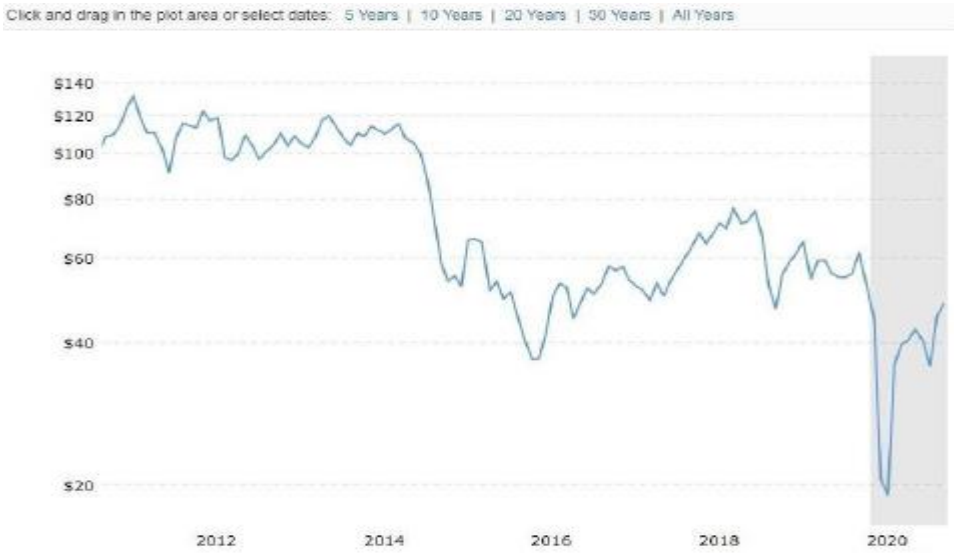
34. 7. My company collaborates with external parties (customers/suppliers) based on trust. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

Oil Market Turbulence

Oil Price in the last 10 years



Oil Market Turbulence

Unexpected and predictable changes in the context of the oil market that impose instabilities at any areas and levels, and could be a result of many causes.

35. 1. Competition for efficiency improvement including cost reduction in the upstream petroleum industry is tight. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

36. 2. The challenges and opportunities in the upstream petroleum industry are kept changing. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

37. 3. It is difficult to predict the oil price for medium (1-5 years) and long term period (above 5 years). *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

38. 4. It is difficult to predict the future characteristics of the upstream petroleum competitive environment. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

39. 5. The evolution of environmental forces is unpredictable. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

Sustainable Business Performance

ECONOMIC, ENVIRONMENTAL AND SOCIAL PERFORMANCE

Profit and Return on Investment (ROI)

Profit

Profit = Revenue - Cost

Gross profit is the profit a company makes after deducting the costs associated with making and selling its products, or the costs associated with providing its services. Oil & Gas Industry has been significantly impacted by the unprecedented shocks of the oil price plunge alongside induced demand erosion combined with the global lockdown triggered by the COVID-19 pandemic. As a result of a significant decrease in oil price, gross profit also decreased.

Return on investment (ROI)
ROI = net profit / investment cost
A high ROI means the investment's gains compare favorably to its cost. ROI is used to evaluate the efficiency of an investment. As a result of a significant decrease in oil price, gross profit and net profit also decreased, this affected to also decreased in return on investment.

To what extent does each statement reflect your company from implementing sustainable business practices? Please consider the performance in the last 3 years (2018, 2019, and 2020) relatively compared to the situation before oil price drop.

40. 1. My company's profit increases every year even during recent (low) oil prices. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

41. 2. My company's return on investment (ROI) is increasing every year even during recent (low) oil prices. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

42. 3. My company maintains and/or increases sales volume every year. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

43. 4. My company maintains and/or increases shareholder value. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

44. 5. My company increases productivity. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

Environmental Performance

Sustainable Business Performance:

Attain and uphold economic, social, and environmental performance in any circumstance.

Dimension 2: Environmental Performance: Attain and uphold performance in managing pollutions in air, water, and soil.

To what extent does each statement reflect your company from implementing sustainable business practices?

45. 1. My company reduces the emission of greenhouse gases. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

46. 2. My company reduces waste generation. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

47. 3. May company decreases environmental incidents. Example: oil spill, release gas, loss of primary containment (LOPC). *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

48. 4. My company reduces the consumption of hazardous materials. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

49. 5. My company more careful and efficient use of natural resources e.g. water. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

Social Performance

Sustainable Business Performance:
Attain and uphold economic, social, and environmental performance in any circumstance.

Dimension 3: Social Performance: Attain and uphold stakeholder satisfaction, increase local community acceptance, improve company image, minimize social risks, and ensure legal compliance.

To what extent does each statement reflect your company from implementing sustainable business practices?

50. 1. Stakeholders are satisfied with my company's sustainable business practices. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

51. 2. My company reduces social and reputation risks to the general public. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

52. 3. My company improves employee health and safety. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

53. 4. My company is aware of the community's needs and rights. *

Mark only one oval.

	1	2	3	4	5	
Strongly DIAGREE	◯	◯	◯	◯	◯	Fully AGREE

54. 5. My company always tries to comply with any legal requirement. *

Mark only one oval.

	1	2	3	4	5	
Strongly DISAGREE	◯	◯	◯	◯	◯	Fully AGREE

Appendix C Questionnaire Expert Validation

QUESTIONNAIRE EXPERT VALIDATION

RESEARCH TITLE
EXAMINING SUSTAINABLE BUSINESS PERFORMANCE DETERMINANTS IN MALAYSIA UPSTREAM PETROLEUM INDUSTRY

Dear Prof/Assoc.Prof/Dr

I am currently doing the aforementioned research as my Ph.D. thesis undertaking. I have adopted and adapted research instruments from previous studies to measure the construct of interest. The current stage is content to validate the items to establish whether they matched their operational definition. I would be grateful if you could spend some time to read through the items and assess their content validity.

Please respond to the exercise by indicating with a tick (✔) mark whether each item is a “Perfect Match”, “Fair Match” or “Poor Match”. Kindly provide your comments (if any) in the “Comments” column.

Thank you in advance for your time and expertise.

Sriyanta Hadi
(PhD Candidate)
Azman Hashim International Business School (AHIBS)
Universiti Teknologi Malaysia
Kuala Lumpur

Organizational Learning Culture: A multi-level collective learning process through shared values, thoughts, and actions across the whole organization to gain a competitive advantage and support sustainable business performance.					
Questionnaire Items	Likert Scale	Your Assessment (Please tick ✔) Perfect match	Fair match (alter)	Poor match (remove)	Comments
1. In my organization, people are rewarded for learning (adopted from Marsick & Watkins, 2003).	(1) Strongly disagree; (2) Partially disagree; (3) Neither agree nor disagree;	✔ ✔			
2. In my organization, people spend time building trust with each other (adopted from Marsick & Watkins, 2003).		✔ ✔			
3. In my organization, teams/groups revise their thinking as a result of group discussions or information collected (adopted from Marsick & Watkins, 2003).		✔ ✔			
4. My organization makes its lessons learned available to all employees (adopted from Marsick & Watkins, 2003).		✔ ✔			
5. My organization recognizes people for taking initiative (adopted from Marsick & Watkins, 2003).		✔ ✔			

Organizational Learning Culture: A multi-level collective learning process through shared values, thoughts, and actions across the whole organization to gain a competitive advantage and support sustainable business performance.					
Questionnaire Items	Likert Scale	Your Assessment (Please tick ✔)			Comments
		Perfect match	Fair match (alter)	Poor match (remove)	
6. My organization supports employees who take calculated risks (adopted from Marsick & Watkins, 2003).	(4) Partially agree; (5) Fully agree	✔ ✔			
7. My organization uses two-way communication regularly, such as suggestion systems, electronic bulletin boards, or town hall/open meetings (adopted from Marsick & Watkins, 2003).		✔ ✔			
8. My organization works together with the outside community to meet mutual needs (adopted from Marsick & Watkins, 2003).		✔ ✔			
9. In my organization, leaders generally support requests for learning opportunities and training (adopted from Marsick & Watkins, 2003).		✔ ✔			
10. In my organization, leaders ensure that the organization's actions are consistent with their values (adopted from Marsick & Watkins, 2003).		✔ ✔			

Digital Organizational Culture: A set of shared values, assumptions, beliefs, ways of interacting, and ways of working that contribute to a unique social and psychological environment of an organization or company in creating, delivering, and capturing value by employing digital technologies.					
Questionnaire Items	Likert Scale	Your Assessment (Please tick ✔)			Remarks from Researcher
		Perfect match	Fair match (alter)	Poor match (remove)	
1. Revised: In my company, the teams collaborate functionally in the initiatives for *digital transformation and relevant innovation* (adapted from E.Martinez-Caro et al., 2020). Previous: In my company, the teams collaborate functionally in the initiatives for innovation and digital transformation.	(1) Strongly disagree; (2) Partially disagree; (3) Neither agree nor disagree;	✔	✔		Relevant innovation refers to any innovation that requires the support of digital technology.
2. In my company, there is a clear orientation to digital technology changes (adapted from E.Martinez-Caro et al., 2020).		✔ ✔			
3. In my company, the culture of digital innovation and change takes part as a natural process (adapted from E.Martinez-Caro et al., 2020).		✔ ✔			
4. My company shares with the staff the digital strategy, taking into consideration their suggestions (adopted from E.Martinez-Caro et al., 2020).		✔ ✔			

5. In my company, my manager provides help, encourages, and supports training including digital technology training to improve performance (adapted from Tang et al., 2000).	(4) Partially agree; (5) Fully agree	✔ ✔			

Note : ✔ Expert #1
✔ Expert #2

Revised means revised questions by incorporating the comments from experts.
Previous means original question.

Put an additional word of ‘company’ in the definition.

Sustainable Business Practices: Strategic and systematic practices within the organization and possible external collaboration to attain and uphold economic, environmental, and social performance.

Questionnaire Items	Likert Scale	Your Assessment (Please tick ✔)			Remarks from Researcher
		Perfect match	Fair match (alter)	Poor match (remove)	
1. My company prefers environmentally friendly products (adapted from Chiapepetta Jabbour et al., 2020).	(1) Strongly disagree; (2) Partially disagree; (3) Neither agree nor disagree;	✔ ✔			
2. My company improve efficiency, apply lean work processes, reduce waste, and rework (adapted from Chiapepetta Jabbour et al., 2020).		✔ ✔			
3. My company adopts/adapts reuse, recycling, and remanufacturing initiatives (adapted from Chiapepetta Jabbour et al., 2020).		✔ ✔			
4. My company develops/uses new digital and internet-based tools/systems/databases (adapted from Chiapepetta Jabbour et al., 2020).		✔ ✔			
5. My company upgrades/replaces current equipment and technologies with more efficient ones (adapted from Chiapepetta Jabbour et al., 2020).		✔ ✔			
6. My company re-design operation processes to reduce greenhouse gas emissions (adapted from Abreu et al. 2017).		✔ ✔			

7.	My company collaborates with external parties (customers/suppliers) based on thrust (adapted from Geyi et al. 2020).	(4) Partially agree; (5) Fully agree				Add a new question to cover 'possible external collaboration'.

Note : ✔ Expert #1
✔ Expert #2

Final means after incorporating the comments.
Previous means original question.

Put an additional phrase of 'possible external collaboration' in the definition.

Oil Market Turbulence: Unexpected and predictable changes in the context of the oil market that impose instabilities at any areas and levels, and could be a result of many causes.

Questionnaire Items	Likert Scale	Your Assessment (Please tick ✔)			Remarks from Researcher
		Perfect match	Fair match (alter)	Poor match (remove)	
1. Competition in the oil & gas industry including cost reduction efforts is cutthroat (adapted from Wang et al., 2015).	(1) Strongly disagree; (2) Partially disagree; (3) Neither agree nor disagree;	✔ ✔			
2. In the upstream petroleum industry, changes take place continuously (adapted from DeClercq et al., 2015).		✔ ✔			
3. It is difficult to predict demand for oil and oil prices (adapted from Zhou, 2019).		✔ ✔			
4. It is difficult to accurately predict the future characteristics of our competitive environment (adapted from Santos-Vijande & Alvarez-Gonzalez, 2007).		✔ ✔			
5. The evolution of environmental forces is unpredictable (adapted from Santos-Vijande & Alvarez-Gonzalez, 2007).		✔ ✔			

	(4) Partially agree; (5) Fully agree				

Note : ✔ Expert #1
✔ Expert #2

Revised means revised questions by incorporating the comments from experts.
Previous means original question.

Sustainable Business Performance: Attain and uphold economic, social, and environmental performance in any circumstance.

Dimension 1: Economic Performance: Attain and uphold profitability, return on investment, improve sales volume, increase shareholder value, and productivity.

Questionnaire Items	Likert Scale	Your Assessment (Please tick ✔)			Remarks from Researcher
		Perfect match	Fair match (alter)	Poor match (remove)	
To what extent does each statement reflect your company from implementing sustainable business practices? *Please consider in the last 3 years.*					For the last 3 years.
1. *Revised: My company's profit increases every year* (adapted from Chiappetta Jabbour et al., 2020). Previous: My company improves profitability.	(1) Strongly disagree;	✔	✔		The previous sentence has been revised based on feedback given by experts.
2. *Revised: My company's return on investment (ROI) is improving every year* (adapted from Chiappetta Jabbour et al., 2020). Previous: My company improves return on investment.		✔	✔		The previous sentence has been revised based on feedback given by experts.

3. *Revised: My company's sales volume increases every year* (adapted from Fernando et al., 2019). Previous: My company improves sales volume.	(2) Partially disagree; (3) Neither agree nor disagree; (4) Partially agree; (5) Fully agree	✔	✔		The previous sentence has been revised based on feedback given by experts.
4. My company increases shareholder value (adapted from Abreu et al., 2017).		✔ ✔			
5. My company increases productivity (adapted from Abreu et al., 2017).		✔ ✔			

Note : ✔ Expert #1
✔ Expert #2

Revised means revised questions by incorporating the comments from experts.
Previous means original question.

Sustainable Business Performance: Attain and uphold economic, social, and environmental performance in any circumstance. **Dimension 2: Environmental Performance:** Attain and uphold performance in managing pollutions in air, water, and soil.					
Questionnaire Items	Likert Scale	Your Assessment (Please tick ✔)			Remarks from Researcher
		Perfect match	Fair match (alter)	Poor match (remove)	
To what extent do each statement reflect your company from implementing sustainable business practices?					
1. Revised: My company reduces the emission of *greenhouse gases* (GHG) (adapted from Chiappetta Jabbour et al., 2020). Previous: My company reduces the emission of polluting gases.	.(1) Strongly disagree; (2) Partially disagree;	✔	✔		Put additional words of *greenhouse gases* to make it a clear sentence.
2. My company reduces waste generation (adapted from Chiappetta Jabbour et al., 2020).		✔ ✔			

3. Revised: My company decreases environmental incidents. *Example: oil spill, release gas, loss of primary containment (LOPC)* (adapted from Chiappetta Jabbour et al., 2020). Previous: My company decreases environmental incidents.	(3) Neither agree nor disagree; (4) Partially agree; (5) Fully agree	✔	✔		Examples are provided to make a clear sentence.
4. My company reduces the consumption of hazardous materials (adapted from Chiappetta Jabbour et al., 2020).		✔ ✔			
5. Revised: My company's more careful and efficient use of natural resources e.g. water (adapted from Chiappetta Jabbour et al., 2020). Previous: My company more efficient use of natural resources.		✔	✔		

Note : ✔ Expert #1
✔ Expert #2

Revised means revised questions by incorporating the comments from experts.
Previous means original question.

Sustainable Business Performance: Attain and uphold economic, social, and environmental performance in any circumstance.

Dimension 3: Social Performance: Attain and uphold stakeholder satisfaction, increase local community acceptance, improve company image, minimize social risks, and ensure legal compliance.

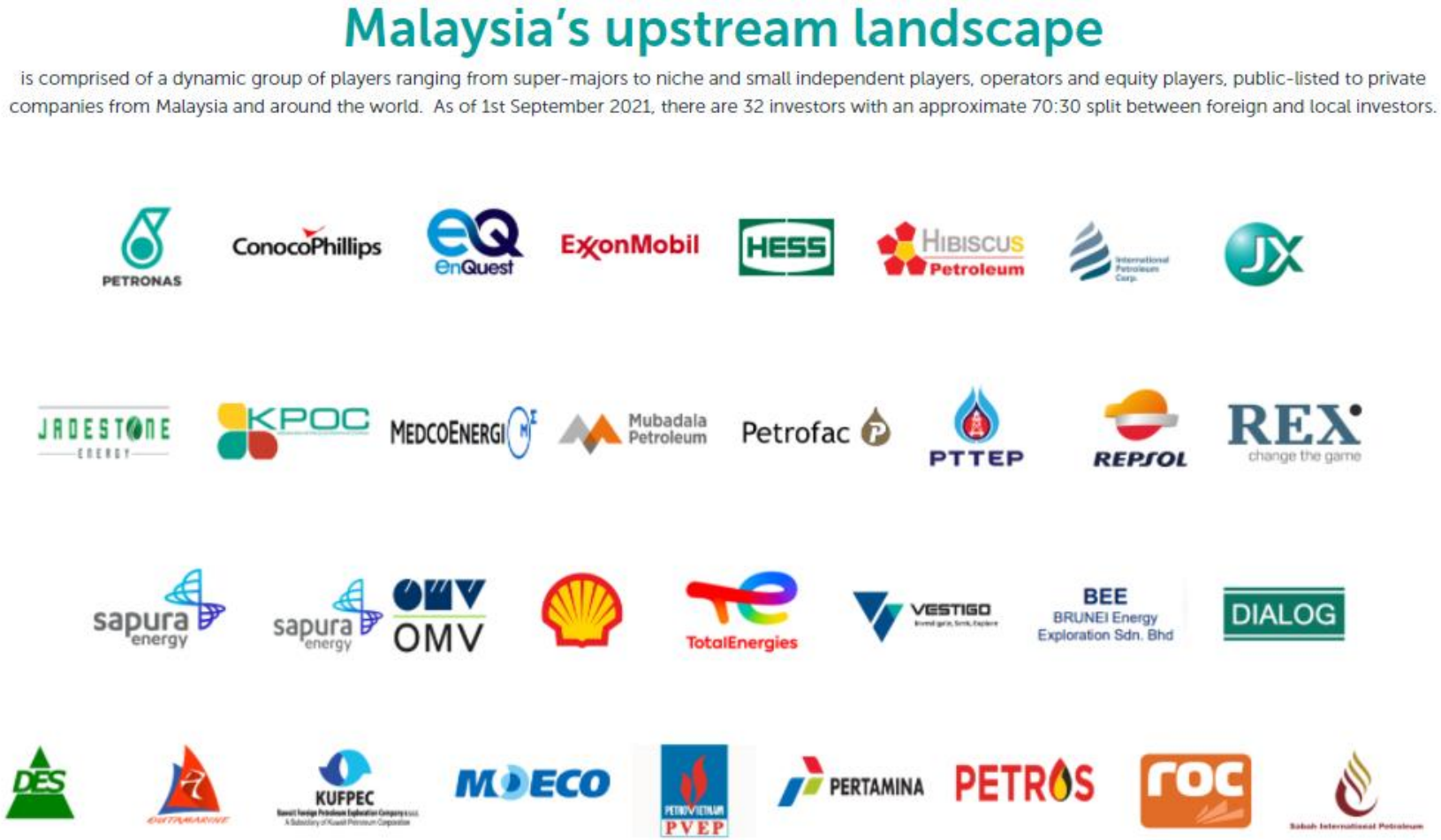
Questionnaire Items	Likert Scale	Your Assessment (Please tick ✔)			Remarks from Researcher
		Perfect match	Fair match (alter)	Poor match (remove)	
To what extent does each statement reflect your company from implementing sustainable business practices?	(1) Strongly disagree; (2) Partially disagree;				
1. *Revised: Stakeholders are satisfied with my company's sustainable business practices* (adapted from Chiappetta Jabbour et al., 2020). Previous: My company improves stakeholder satisfaction.		✔	✔		The previous sentence has been revised based on the feedback from expert reviewers.

2. My company reduces social and reputation risks to the general public (adapted from Chiappetta Jabbour et al., 2020).	(3) Neither agree nor disagree;	✔ ✔			
3. My company improves employee health and safety (adapted from Chiappetta Jabbour et al., 2020).		✔ ✔			
4. *Revised: My company is aware of the community's needs and rights* (adapted from Chiappetta Jabbour et al., 2020). Previous: My company gains knowledge about the community's needs and rights. .	(4) Partially agree;	✔	✔		The previous sentence has been revised based on the feedback from expert reviewers.
5. *Revised: My company always tries to comply with any legal requirement* (adapted from MCS Abreu et al., 2017). Previous: My company attempts legal compliance.	(5) Fully agree	✔	✔		The previous sentence has been revised based on the feedback from expert reviewers.

Note : ✔ Expert #1
✔ Expert #2

Revised means revised questions by incorporating the comments from experts.
Previous means original question.

Appendix D Investors in Malaysia's Upstream Petroleum Industry (as of December 2021)

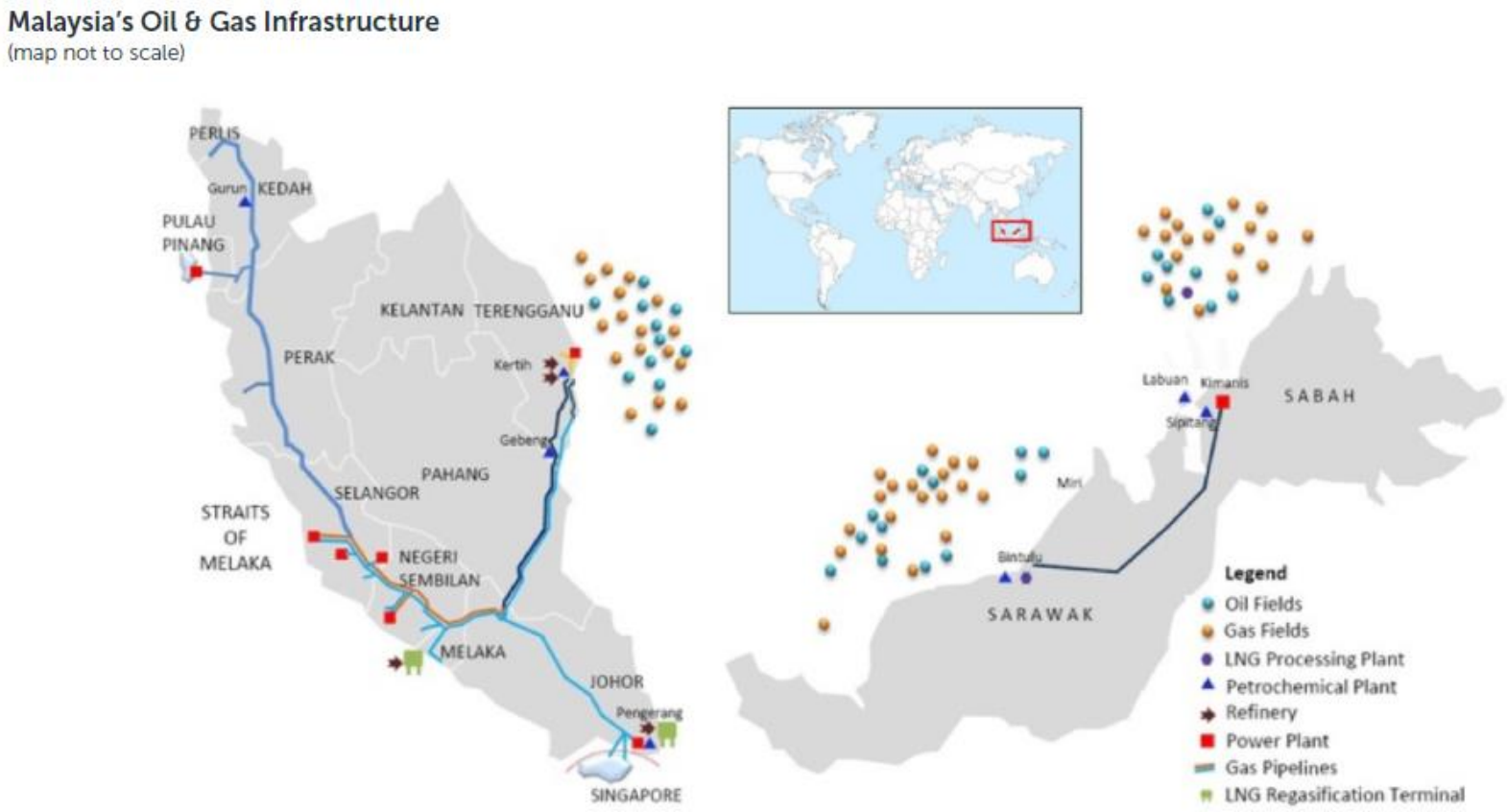


Source: Malaysia Petroleum Management (MPM)

List of investors:

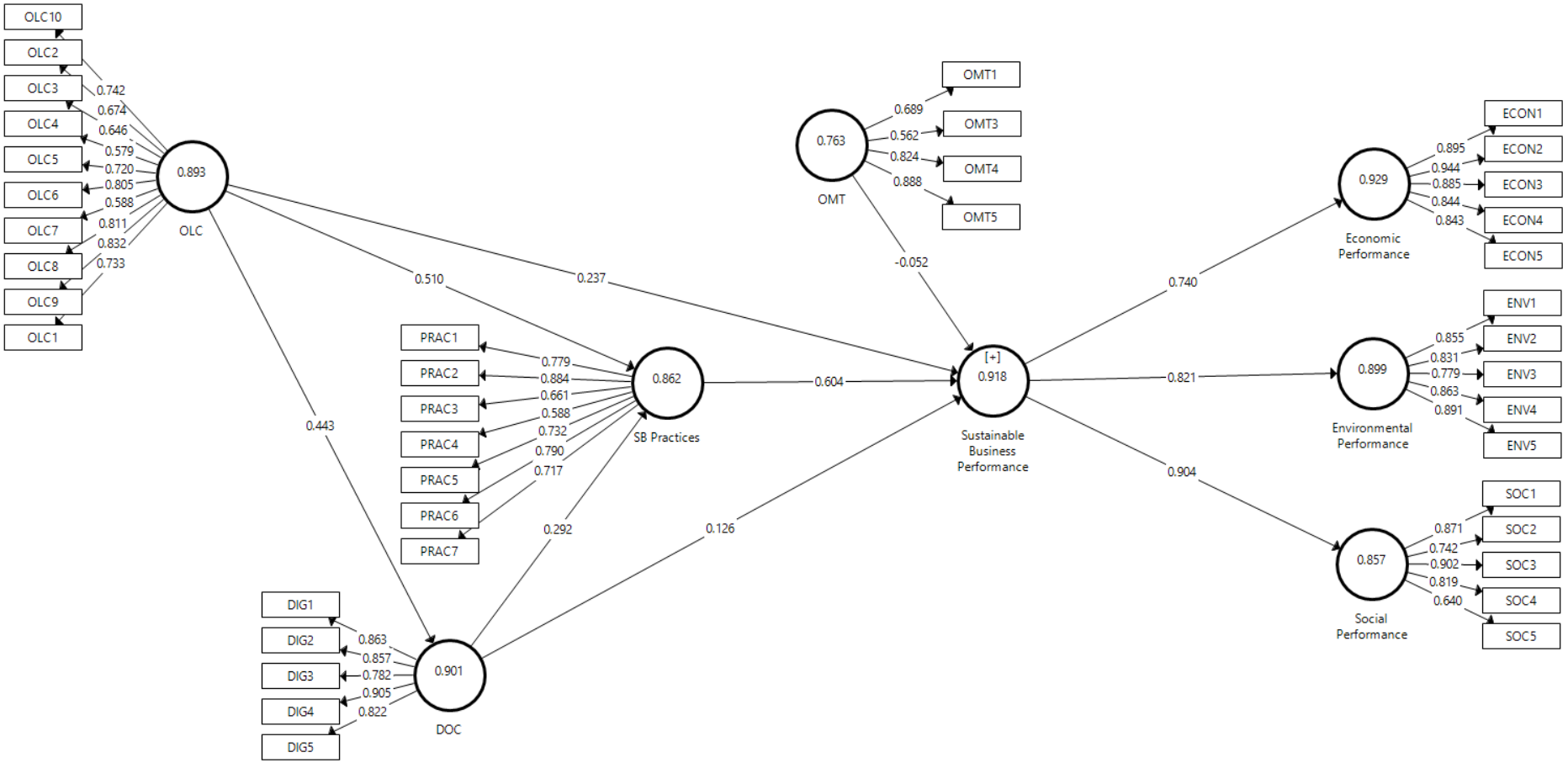
1. PETRONAS
2. ConocoPhillips
3. Enquest
4. ExxonMobil
5. Hess
6. Hibiscus Petroleum
7. International Petroleum Corporation
8. JX Nippon Oil and Gas Exploration
9. Jadestone Energy
10. Kebabangan Petroleum Operating Company (KPOC)
11. Medco Energy
12. Mubadala Petroleum
13. Petrofac
14. PTT Exploration & Production (PTTEP)
15. Repsol
16. Rex International Holding Limited
17. Sapura Energy
18. Sapura Energy OMV
19. Shell
20. Total Energy
21. Vestigo
22. Brunei Energy Exploration Sdn Bhd
23. Dialog
24. DES
25. Duta Marine
26. KUFPEC
27. MOECO
28. PVEP
29. PERTAMINA
30. PETROS
31. Roc Oil
32. Sabah Internation Petroleum (SIP)

Appendix E Malaysia's Oil and Gas Infrastructure

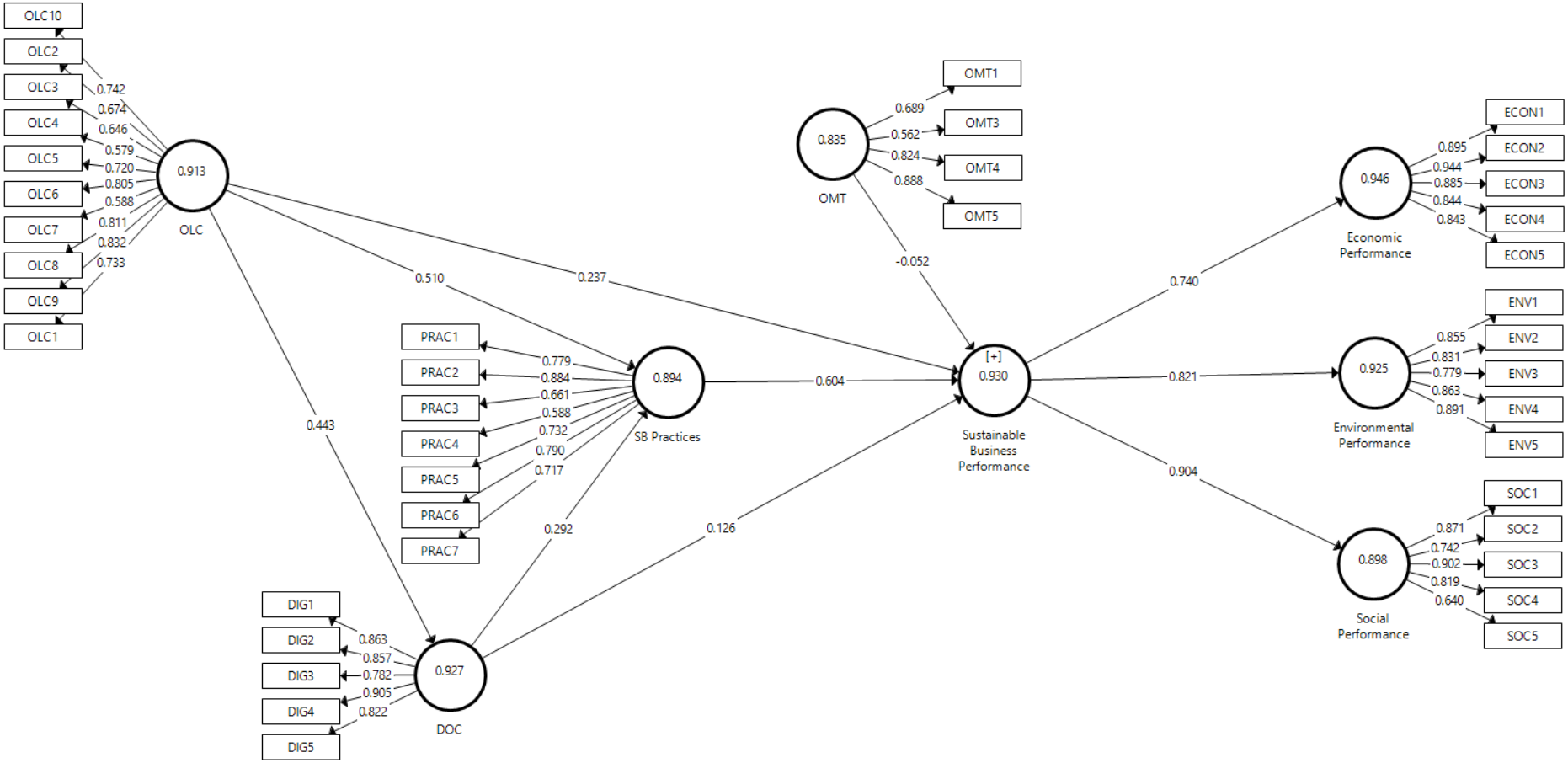


Source: Malaysia Petroleum Management (MPM)

Appendix F Pilot Test (N=30)

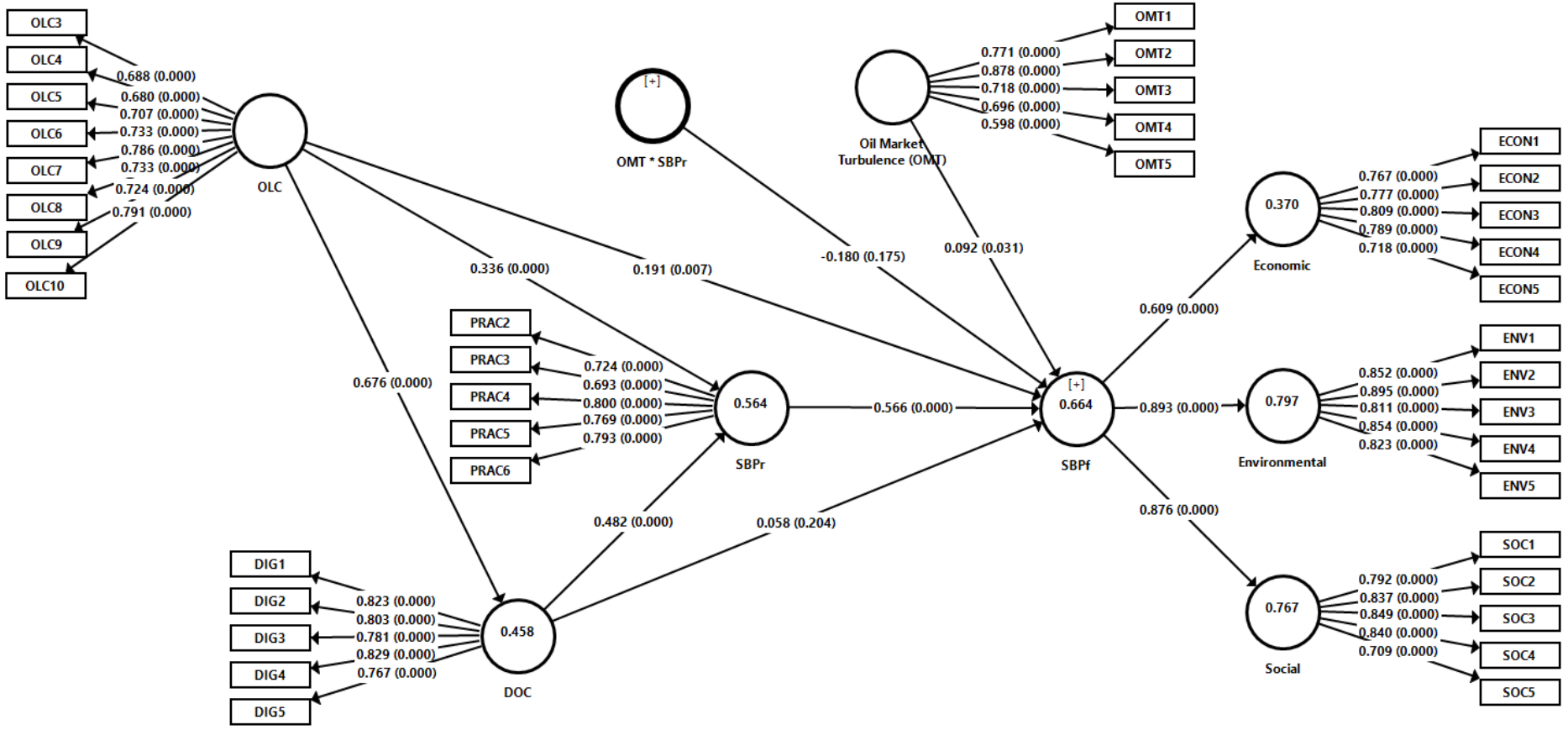


Note:1) Inside the construct is Cronbach Aplha value

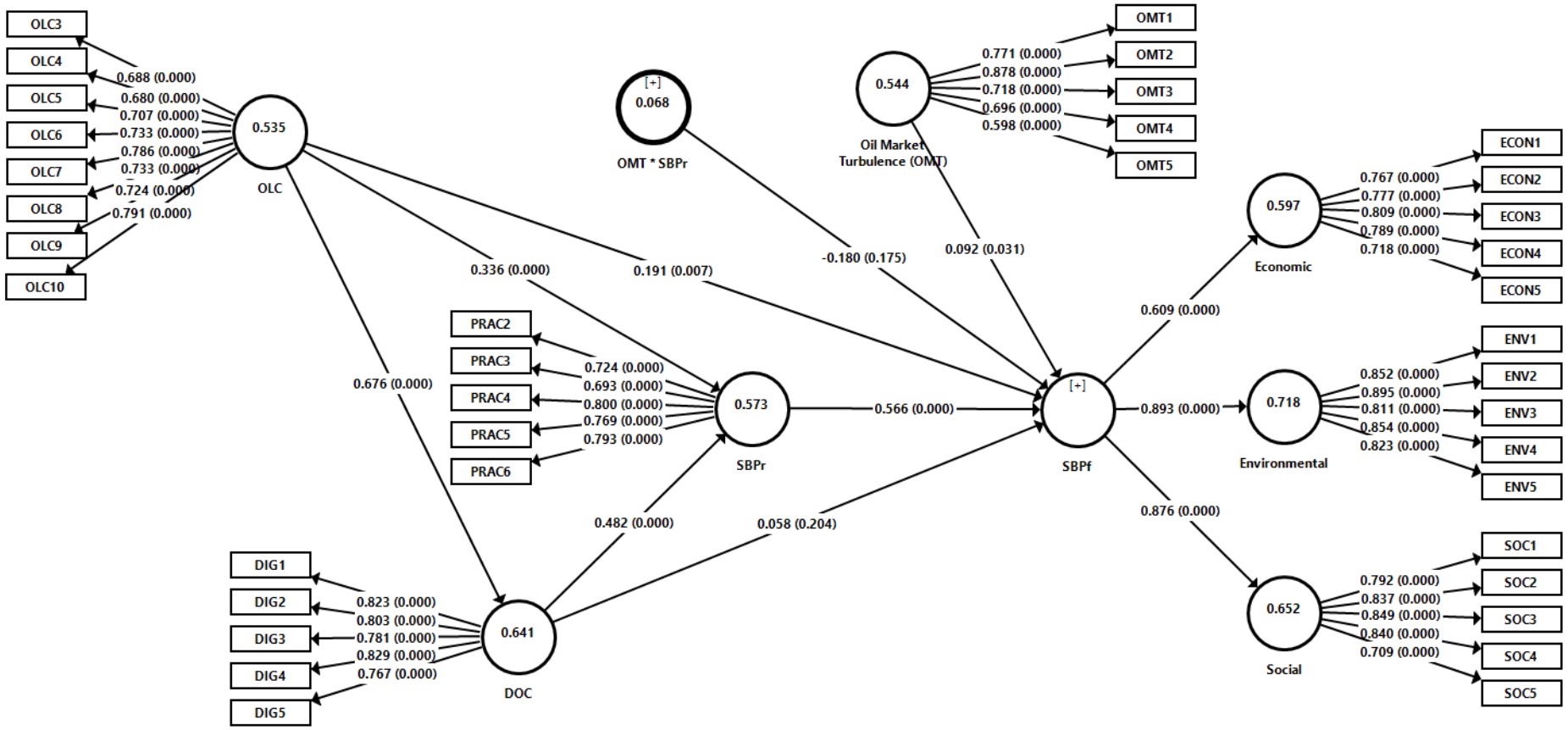


Note: Inside the construct is Composite Reliability (CR)

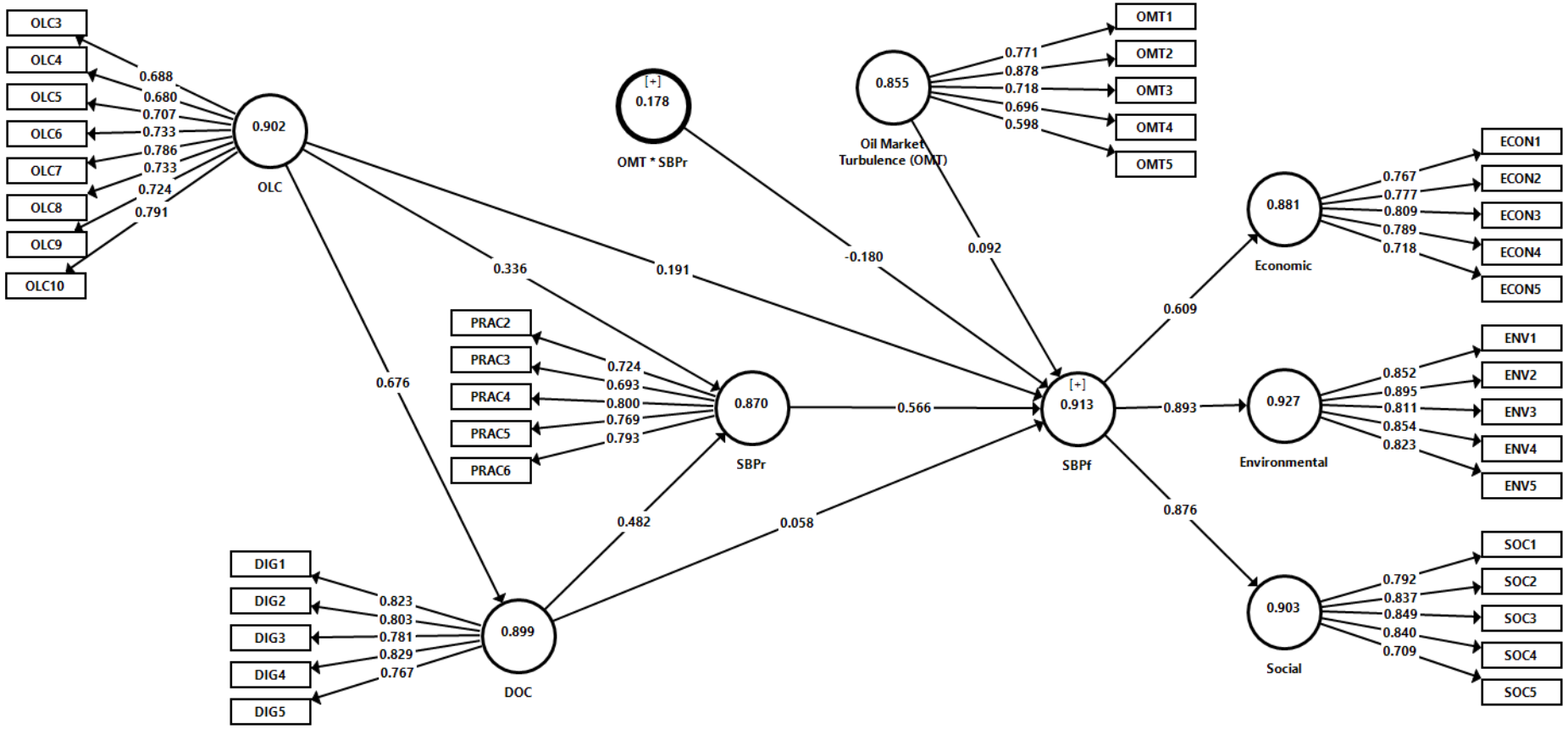
Appendix G PLS-SEM Model (N=220)



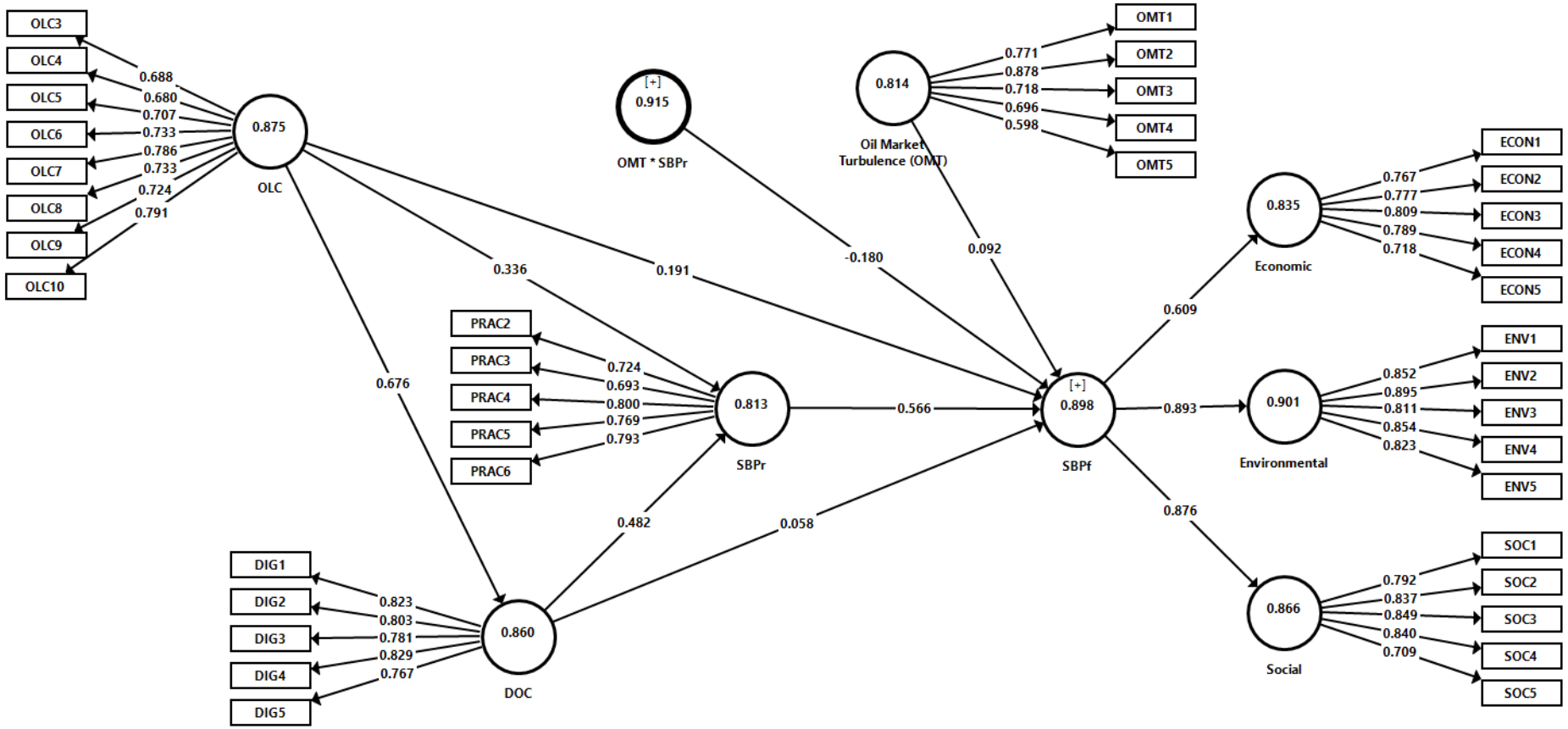
Note: Inside the construct is R^2 value



Note: 1) Inside the construct is AVE value, 2) AVE of SBPf construct is 0.645 (manually calculated)

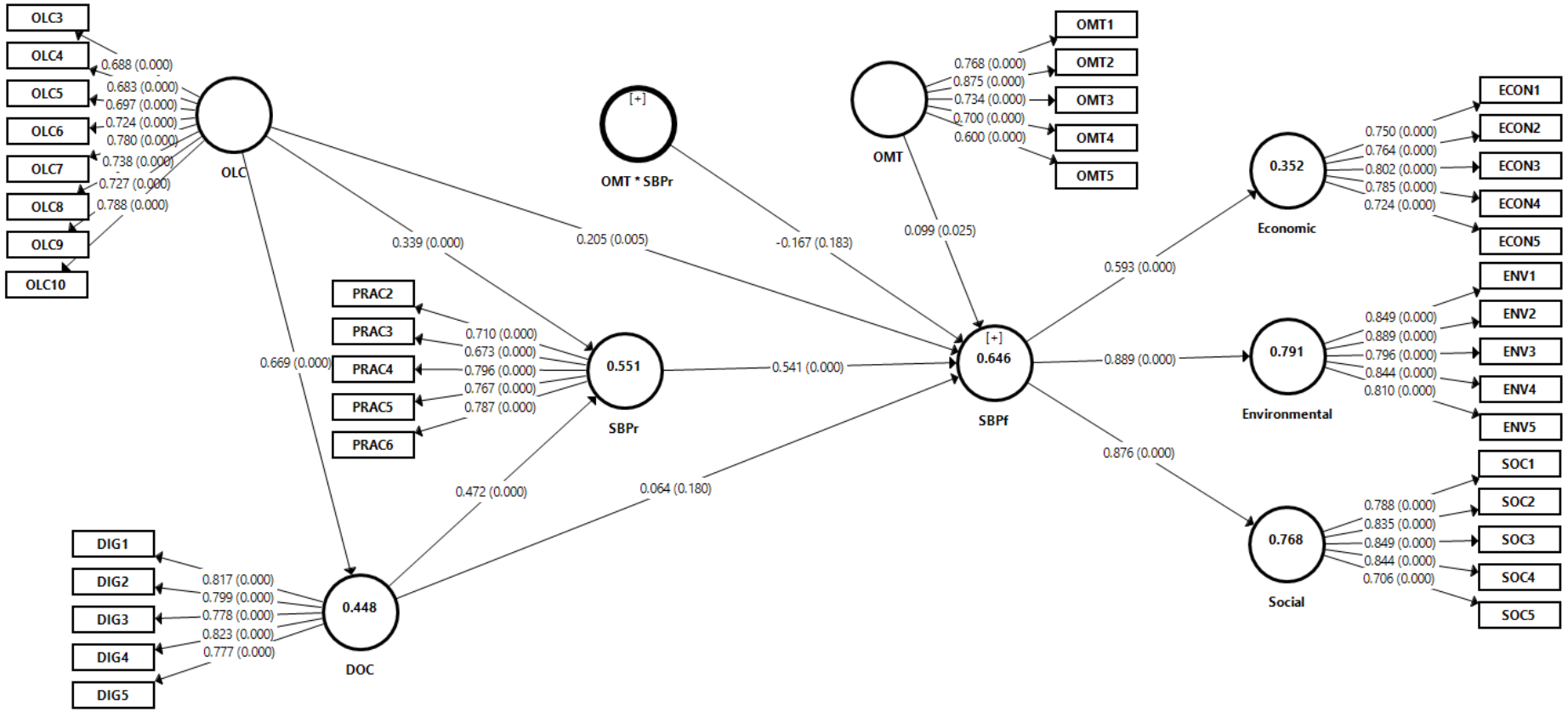


Note: 1) Inside the construct is Composite Reliability (CR), 2) Manual CR of SBPf gives 0.842

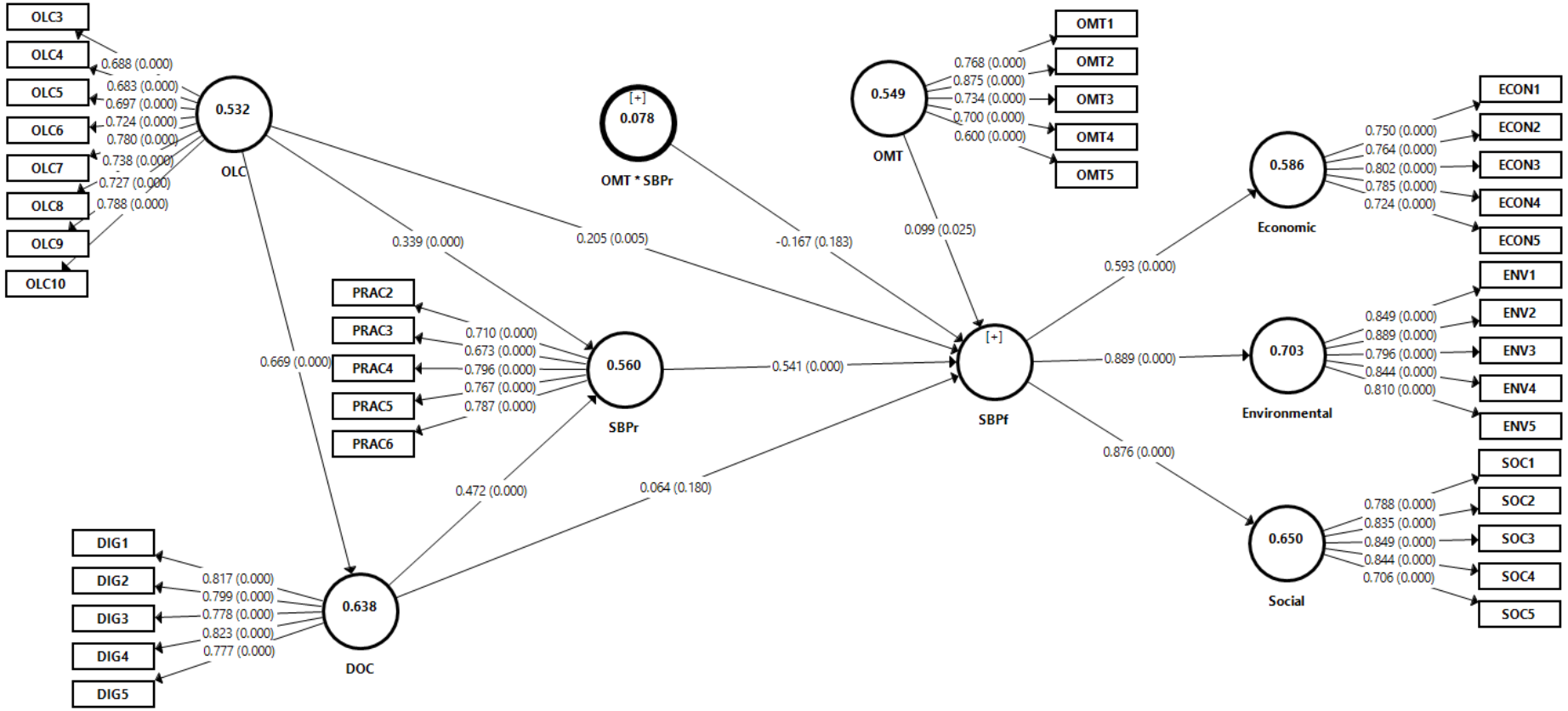


Note: Inside the construct is Cronbach-Alpha

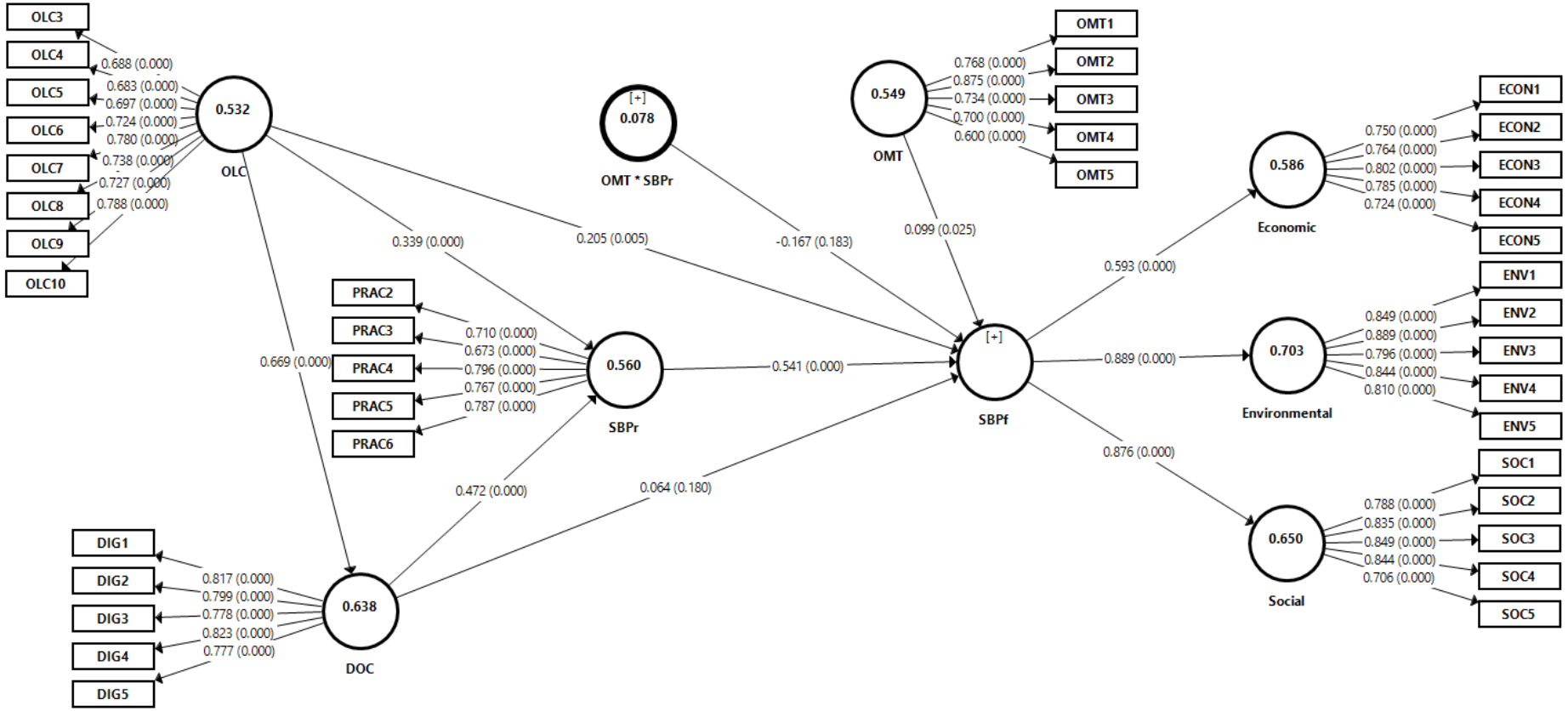
Appendix H PLS-SEM Model (N=218)



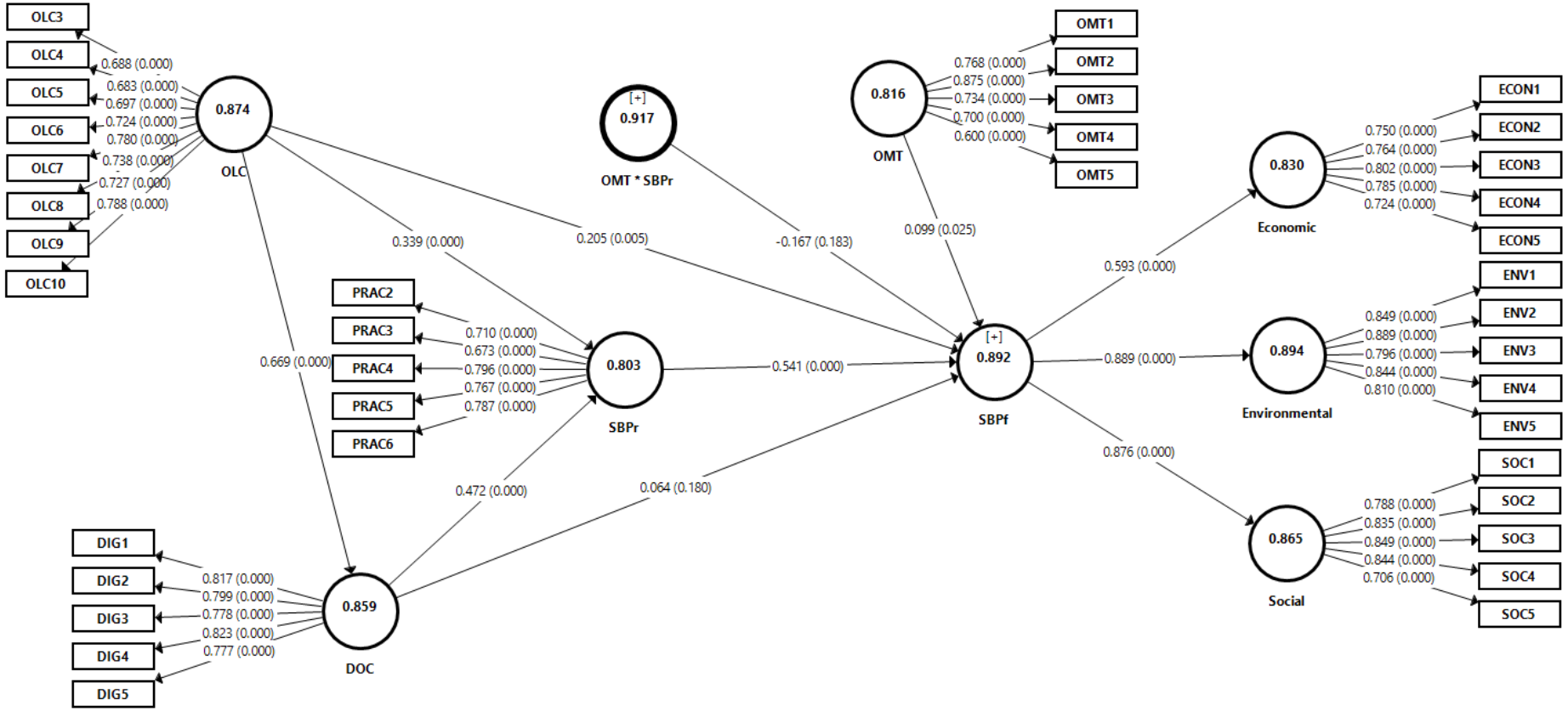
Note: Inside the construct is R^2 value



Note: 1) Inside the construct is Composite Reliability (CR), 2) Manual CR of SBPf gives 0.828



Note: 1) Inside the construct is AVE value, 2) AVE of SBPf construct is 0.623 (manually calculated)



Note: Inside the construct is Cronbach-Alpha

Appendix I Review of Organizational Learning Construct Articles

Author (year)	Study Design	Sample	Independent variable	Mediator	Dependent variable	Key Findings
(S. Ali et al., 2020)	Quantitative	Hotel in the UK and Pakistan, 240 samples	Organizational learning	Capabilities	Performance	Positive
(Eniola et al., 2019)	Quantitative	SMEs in Nigeria, 364 samples	Organizational culture	Not applicable	Total quality management	Positive
(Hahn et al., 2015)	Quantitative	IT companies in South Korea, 137 samples.	Organizational Learning Culture	Not applicable	Creativity	Positive
(Hung et al., 2010)	Analytical-synthetic	Taiwan high-tech industry, 355 samples.	Organizational learning	Dynamic capability	Performance	Positive
(Hussein et al., 2016)	Quantitative	High education institutes in Malaysia, 40 samples	Organizational Learning Culture	Not applicable	Performance	Positive
(Kandemir & Hult, 2005)	Quantitative	International joint ventures. Conceptual.	Organizational Learning Culture	Innovation culture and capacity	Performance	Not applicable
(Lin & Lee, 2017)	Quantitative	21 Taiwan firms, 54 managers, and 511 staff,	Organizational learning	Work engagement	Innovative behavior	Positive
(Naqshbandi & Tabche, 2018)	Quantitative	Indian companies, 160 samples	Empowering leadership	Organizational Learning Culture	Outbound and inbound innovation	Negative on the effect of organizational learning culture
(Skerlavaj et al., 2007)	Quantitative	Slovenian companies, 203 samples	Organizational Learning Culture	Employee	Performance (includes non-financial)	Positive
(Škerlavaj et al., 2010)	Quantitative	South Korean firms, 207 samples	Organizational Learning Culture	Not applicable	Innovation	Positive significant
(Škerlavaj et al., 2011)	Quantitative	Macedonian firms, 202 samples	Organizational Learning Culture	Not applicable	Non-financial performance	Relative strong
(Vargas, 2015)	Analytical-synthetic	Use previous works (literature review).	Organizational learning	Not applicable	Performance and business innovation	Positive

Appendix J Review of Digital Construct Articles

Author (year)	Study Design	Sample	Independent variable	Mediator	Dependent variable	Key Findings
(Balogun et al., 2020)	Qualitative, case study	Case studies by continent	Digitalization	Not applicable	Climate change adaption	Positive
(Bouwman et al., 2019)	Quantitative	321 European SMEs, 563 samples	1)Resources, 2)strategy	Innovativeness, practices	Firm performance	Positive
(Eller et al., 2020)	Quantitative	SMEs in Austria, 193 samples	1)Information Technology (IT), 2)skills, 3)digital strategy	Digitalization	Financial performance	Positive and significant (1 & 2)
(Chang et al., 2019)	Quantitative	Taiwan top 5000 firms, 204 samples	Business system leveraging	Information sharing,	Supply chain performance	Positive
(Isensee et al., 2020)	Quantitative	Not applicable	Digitalization level	Organization culture	Sustainability level	Suggested framework
(Lee et al., 2019)	Case study.	Case analysis.	Digitalization	Not applicable	Process safety	Positive
(Martínez-Caro et al., 2020)	Quantitative	93 multinational firm production centers	Digital Organizational Culture	Business digitization, digital technologies value development	Firm performance	Positive
(Škare & Soriano, 2021)	Quantitative	EU dynamic panel data 2009-2018	Digitalization	Not applicable	Firm agility	Positive
(Tortolerra et al., 2020)	Quantitative	Firms in Brazil, 135 samples	Industry 4.0	Organizational learning	Operational performance	Positive
(Ukko et al., 2019)	Quantitative	5830 SMEs in Finland, 280 samples	Digital business strategy	Not applicable	Financial performance	Positive
(Upadhyay & Kumar, 2020)	Quantitative	IT companies in India	Big data analytics capability	Not applicable	Firm performance	Positive and significant

Appendix K Literature Review Summary

No	Author	Yr	Study Objective(s)	Industry	Study Design	Study Sample	IV	DV	Mediator	Moderator	Theory	Key Findings	Journal
1	Abdullah et. al.	2020	To examine the disclosure quality and its impact on performance	Plantation	Quantitative	palm oil firm annual report 2013- 2017	Disclosure quality	Firm performance	n/a	n/a	Legitimacy theory	Positive	Journal of Cleaner Production journal
2	Abreu et al.	2017	To investigate the practice to reduce ecological uncertainty caused by firms direct dependence on nature	Energy	Qualitative	The Brazilian energy firm, 105 samples	1) stakeholder pressure, 2) climate change risks	Carbon management practices	n/a	n/a	resource dependence theory (RDT)	companies undertake 1 of 4 different strategies ranging from a minimalist approach to the regulation shaper	Journal of Cleaner Production
3	Aksoy et al.	2020	To examine the drivers leading to a high level of corporate sustainability performance	General	Quantitative	Bursa Turkish listed firms	Foreign and institutional ownership	Corporate sustainability performance	n/a	Financial performance, leverage, age, corporate governance index	Stakeholder theory	Positive	Journal of Cleaner Production
4	Alam et al.	2019	To investigate institutional determinants of R&D investment	R&D	General Method of Moment (GMM)	664 firms in 20 emerging markets	External environment of emerging countries	R&D investment	n/a	n/a	Institutional theory	corruption of a particular emerging country is found to be most important in influencing R&D investment followed by regularity quality, government effectiveness, rule of law, and political instability	Technological Forecasting & Social Change
5	Ali et al.	2020	To examine the influence of organizational learning on performance	Tourism	Quantitative	240 hotel managers in the UK and Pakistan	Organizational learning	Performance	Dynamic capability, substantive capability	n/a	Resource-based view (RBV) and Knowledge-based view	Positive, mediated by dynamic capability and substantive capability	International Journal of Hospitality Management
6	Asadi et al.	2020	To investigate the factors influencing the adoption of green innovation, and its effects on performance	Service, hotel, hospitality	Quantitative	183 hotels in Malaysia	Green innovation procedures	Sustainable business performance - 3 dim	Green innovation	n/a	RBV	Positive	Journal of Cleaner Production

No	Author	Yr	Study Objective(s)	Industry	Study Design	Study Sample	IV	DV	Mediator	Moderator	Theory	Key Findings	Journal
7	Awan et al	2017	To examine the relationship between stakeholder pressure and adoption of sustainable supply chain practices and impact on sustainability performance	General	Quantitative	272 manufacturing firms in Pakistan	Sustainable supply chain performance	Sustainability performance	n/a	n/a	Stakeholder theory	Positive significant	Procedia Manufacturing
8	Aydiner et al.	2019	To validate the mediating role of business process performance on business analytics and performance	General	Quantitative	204 senior and high-level executives	1) Business analytics, 2) Business process	Firm performance	Business process as a mediator	Firm size, age, sector	RBV	1) Positive 2) Positive, 3) Positive mediator	International Journal of Information Management
9	Bali et al.	2019	To examine sustainable structure effects on sustainable performance	Iron and steel industry	Quantitative	Iron and steel industry in India	Sustainable structure, sustainable production practices	Sustainable Performance - 1 dim	Sustainable conduct	n/a	Structure conduct performance paradigm - Edward Chamberlin (1933)	green relative index positively significant in respect of green value-added	Journal of Cleaner Production
10	Balogun et al.	2020	To assess the digitalization role for climate change adaptation	9 cities on different continents	Qualitative, case study	Case in 9 cities in a different continent	social-ecological-technological challenges and tensions around IR 4.0	potentials of digitalization in addressing climatic hazards and to highlight benefits from implementing digitalization	n/a	n/a	socio-economic dynamics, social-ecological-technological relationship	capabilities of digitalization in supporting more effective early warning and emergency response systems, enhancing food and water security, improving power infrastructure performance, enabling citizen engagement and participatory adaptation measures, and minimizing the impacts of climatic hazards.	Sustainable Cities and Society journal

No	Author	Yr	Study Objective(s)	Industry	Study Design	Study Sample	IV	DV	Mediator	Moderator	Theory	Key Findings	Journal
11	Bento et al.	2019	To investigates the determinant of the success of sustainable orientation capital source	Service, finance	Quantitative	crowdfunding platform Kickstarter data	Sustainable mission	Sustainable Business Performance	n/a	n/a	Self-determination theory	Positive	Journal of Cleaner Production
12	Bouwman et al.	2019	To examine the impact of digitalization, business models on performance.	SME, general	Quantitative	321 European SMEs that use social media, big data, and IT to innovate their business models 563 samples	Resources for business model experimentation, business model strategy implementation practices	Overall firm performance	innovativeness, business model experimentation practices	n/a	seems to be RBV	Positive, there mediating effect	Telecommunications Policy journal
13	Cantele & Cassia	2020	To examine sustainability implementation in restaurants by testing a comprehensive model of antecedents and effects.	Service, hospitality, restourant	Quantitative	334 restaurant in North Italy	1) Sustainability attitude 2) Barrier	Firm performance	sustainability implementation, customer satisfaction, firm competitiveness	n/a	Stakeholder theory	1) Positive, 2) Negative, 3) Mediators are tested	International Journal of Hospitality Management
14	Caseiro and Coelho	2019	To investigate the effect of business intelligence on performance	SME, general	Quantitative	Startup companies in Europe, 228 samples	Business intelligent characteristics	Performance - 1 dim	network learning, innovativeness	n/a	RBV	Positive and significant	Journal of Innovation & Knowledge
15	Ch'ng et al.	2021	To test the moderating effect of market turbulence on eco-innovation and sustainable business performance	General	Quantitative	Firms in Malaysia, 109 samples	Eco-innovation	Sustainable Business Performance - 3 dim	n/a	Market turbulence	RBV	Validated	Journal of Cleaner Production
16	Chams & Garcia-Blandon	2019	To examines the association between the board of directors and sustainable performance	General	Quantitative	Based on the Dow Jones Sustainability Index and S&P Global BMI, 478 multinational companies	board size, gender diversity, age	Sustainable Busines Performance - 1 dim	n/a	n/a	Stakeholder theory	Positive significant	Journal of Cleaner Production

No	Author	Yr	Study Objective(s)	Industry	Study Design	Study Sample	IV	DV	Mediator	Moderator	Theory	Key Findings	Journal
17	Chang et al.	2019	To test business system leveraging on performance (in supply chain context)	General	Quantitative	Taiwan's Top 5000 firms, 204 samples.	Organizational factors, inter-organizational factors	Performance (in the supply chain)	Business system leveraging, information sharing	Process innovation, uncertainty	resource dependence theory (RDT)	Business system leveraging supports performance positively and significant, mediation effect of information sharing is significant	Information and Management
18	Cheah et al.	2019	To examine external resources which mediated by business planning, towards the financial & social performance	Social enterprise	Quantitative	181 social enterprises in Malaysia and Singapore	Financial support, training support	Financial and social performance	business planning	sosio-economic context	resource dependence theory (RDT)	Positive through mediation, Mediator effect is rejected	Journal of Cleaner Production
19	Chege & Wang	2020	To assess the influence of technology transfer on performance	SME, general	Quantitative	SMEs in Kenya, 204 samples	Technology Transfer	Performance - 1 dim	Entrepreneur strategy and attributes towards sustainable practices	n/a	Interpersonal behavior theory	Positive significant.	Technology in Society journal
20	Chege et al.	2019	To assess the influence of technology transfer on performance	Service, Transportation	Quantitative	Kenyan international students, 165 samples	Transfer agent, transfer media, transfer object,	Performance - 1 dim	Transfer object, transfer mechanisms	n/a	Technology transfer model by Bozeman	Positive significant	Technology in Society
21	Chen et al.	2019	To explore the role of supplier involvement to the sustainable initiative execution	General	Quantitative	101 Swedish manufacturers	Stakeholder influence	Sustainable business practices	Sustainable practice	supplier involvement	Extended Resource-based view (ERBV)	Positive significant	Int. J. Production Economics
22	Cho and Lee	2020	To investigate the determinants of competitiveness	Logistics	Quantitative	Logistic companies data	A large scale of marine transportation and logistics	Logistics Performance	n/a	n/a	RBV and institutional theory	Negative	Asian Journal of Shipping and Logistics
23	Chung et al.	2016	To investigate the boundary conditions of personalized managerial ties on business performance	General	Quantitative	Senior executives of 137 firms in Taiwan	Human capital aspect	Business Performance	n/a	n/a	Resource dependence theory (RDT)	Positive and significant	Industrial Marketing Management

No	Author	Yr	Study Objective(s)	Industry	Study Design	Study Sample	IV	DV	Mediator	Moderator	Theory	Key Findings	Journal
24	Damert et al.	2017	To analyze the determinants of financial and carbon performance	General	Quantitative	45 various enterprises	1) Institutional and stakeholder pressure	Financial performance	Carbon governance, carbon competitiveness, carbon reduction, carbon performance	n/a	Institutional and stakeholder theory	Positive	Journal of Cleaner Production
25	De Olivera Brasil et al.	2016	To investigate the relationship between eco-innovation and business performance	Manufacturing	Quantitative	Textile industry in Brazil, 70 samples	Organizational eco-innovation	Business Performance	n/a	Process eco-innovation, product eco-innovation	RBV	Positive and significant	Journal of Cleaner Production
26	Ding et al.	2019	To examine determinants of competitive advantage	Food/diary	Quantitative	Diary industry in China, 245 samples	1) Government regulation, 2) CSR	Competitive advantage	Quality assurance, production behavior, dairy cow culture model	n/a	Institutional theory	1) Positive and significant through mediation	International Journal of Production Economics
27	Donbesuur et al	2020	To investigate the relationship between entrepreneurial orientation and performance	SME, general	Quantitative	229 new ventures in Kenya	Entrepreneurial orientation, business ties, institutional support	Performance - 1 dim	opportunity discovery	n/a	theory of planned behavior, social capital theory	Mediation effect is proved	Journal of Business Research
28	Elango and Dhandapani	2020	To investigate institutional industry context matter and performance relationship.	General	Quantitative	Indian firms, 3483 samples	Institutional industry index	Performance - 1 dim	Business group affiliation as moderator	n/a	Institutional based view theory	Positive	Journal of Business Research
29	Elijido-Ten	2017	To provide empirical evidence on the determinants of sustainability performance	General	Quantitative	Top500 merged Knights list of Global100 Most sustainable Corporations Climate change data are taken from the Carbon Disclosure Project survey.	1)perception of climate change as a risk, 2) five-year average profitability & anticipation of climate change opportunities	Sustainability Performance	n/a	n/a	Prospect theory and RBV	1) Negative significant, 2) Positive	Journal of Cleaner Production

No	Author	Yr	Study Objective(s)	Industry	Study Design	Study Sample	IV	DV	Mediator	Moderator	Theory	Key Findings	Journal
30	Eller et al.	2020	To test that digitalization mediates the link between IT, skills & digital strategy to performance	General	Quantitative	193 SMEs	1) IT, 2) employee skill,	Financial performance (FP)	Digital strategy, digitalization	n/a	RBV	1) dan 2) positive	Journal of Business Research journal
31	Escandon-Barbosa et al	2019	To examine the influence of international orientation on performance	Exporting	Quantitative	Born Global case	Internal orientation	Performance (exporting)	n/a	Innovative capacity, dynamism, favourability of the environment	Internationalization process theory	Positive significant	Heliyon
32	Fasone et al.	2016	To explore the determinants of airport performance	Airport	Quantitative	dataset of German airports	Size/space, number of passangers	Performance (non-aviation revenue) - 1 dim	n/a	n/a	Shifting of traditional core aeronautical service to non-aviation or commerce sources	The conflict between space and the number of passengers	Journal of Air Transport Management
33	Fellnhofer	2017	To examine sustainable business 'Stevenson's construct.	General	Quantitative	301staff from 4 sustainable-oriented organisations	1) Strategic orientation, 2) resource orientation, 3) management structure, 4) reward philosophy, 5) growth orientation, 6) entrepreneurial culture	Innovation success	n/a	n/a	Stevenson's opportunity-based concept (entrepreneurial theory	All positive	Journal of Cleaner Production
34	Fernando et al.	2019	To investigate that service innovation has a mediating effect on the relationship between sustainable performance and environmental innovation	General	Quantitative	Malaysian firms using green technology, 95 samples	Eco-innovations	Sustainable Business Performance - 3 dim	Service innovation capability as a mediator	n/a	RBV	Positive and validated	Resources, Conservation & Recycling

No	Author	Yr	Study Objective(s)	Industry	Study Design	Study Sample	IV	DV	Mediator	Moderator	Theory	Key Findings	Journal
35	Ferron-Vilchez	2016	To investigate the relationships between the different ISO 14001 adoption profiles and both environmental performance and profitability	General	Quantitative	Manufacturing firms in 7 OECD countries, 1214 samples	ISO 14001 adopters that monitor an extensive set of negative environmental impacts	Environmental performance and business performance	n/a	n/a	n/a	Positive	Journal of Cleaner Production
36	Ferron-Vilchez et al.	2017	To investigate stakeholders' influences on the decision to adopt environmental practices and decisions on the design of these practices.	General	Quantitative	1700 firms worldwide	Stakeholders influence	Decision making	n/a	n/a	Stakeholder theory	while stakeholders exert pressure on firms, managers' perceptions of these pressures vary, and these variations appear to influence the design of their environmental practices.	Journal of Cleaner Production
37	Foltean et al.	2019	To bridge the marketing theory-practice gap-related with firm performance	General	Qualitative	11 published papers	A solution to bridge marketing-theory and practice gap	Firm performance	n/a	n/a	Marketing theory, institutional theory	n/a	Journal of Business Research
38	Garay et al.	2017	To investigate the relationship between sustainability information acquisition, proactivity, and performance	Tourism	Quantitative	408 tourism enterprises in Catalonia (Spain)	Information acquisition and proactivity	Sustainable Business Performance – 3 dim	n/a	n/a	Competitive advantage	Positive	Tourism Management
39	Gardas et al.	2019	To examine the influence of determinants of sustainable supply chain management on the business performance	Oil and Gas	Quantitative	490 respondents in India	Collaborative green logistics	Operational and business performance	n/a	n/a	Sustainability of Supply chain management	Positive significant	Sustainable Production and Consumption
40	Godoy-Duran et al.	2017	To assess determinants of eco-efficacy	Horticultural	Quantitative	Horticultural farming in Spain	product specialization, adoption of quality certifications, and	eco-efficiency indicators,	n/a	n/a	Socio-economic	Positive	Journal of Environmental Management

No	Author	Yr	Study Objective(s)	Industry	Study Design	Study Sample	IV	DV	Mediator	Moderator	Theory	Key Findings	Journal
							belonging to a cooperative all						
41	Gomes and Wojahn	2017	To analyze the influence of organizational learning capability in innovative performance on organizational performance	General, SMEs	Quantitative	Textile industry in Brazil, 92 samples	Organizational learning capability	Organizational performance	Innovative performance	n/a	Organizational learning theory	Positive	Revista de Administração
42	Gomes et al.	2020	To investigate the relationship between quality management and sustainable production development	General	Quantitative	In an online survey from ISO 9001 firms, 214 samples	quality management ambidexterity, the simultaneous presence of quality exploitation and exploration practices	Sustainable production (environmentally)	n/a	n/a	quality ambidexterity	Positive; quality management ambidexterity, the simultaneous presence of quality exploitation and exploration practices, is an important determinant of environmentally sustainable production.	International Journal of Production Economics
43	Gomez et al.	2015	To analyze the relationship between management practices for sustainability and business performance	General	Qualitative	Companies members of Brazilian Mining Association (IBRAM), 260 samples	Management practices for sustainability	Business performance	n/a	Firm size	Sustainable business performance concept	Positive and significant	Ecological Indicators
44	Gong et al.	2018	To provide critical reflections on the current state of literature and industry development regarding sustainable performance metrics and offers concrete suggestions to guide future research	General	Literature review	74 articles	(1) exploring the interrelationship between sustainable triple-bottom performance in the decision making, (2) integrating corporate governance mechanism into	n/a	n/a	n/a	n/a	Literature review	Resources, Conservation and Recycling

No	Author	Yr	Study Objective(s)	Industry	Study Design	Study Sample	IV	DV	Mediator	Moderator	Theory	Key Findings	Journal
							the decision-making process for sustainable consideration; and (3) compare between academic theory and industry practice regarding the performance metrics proposed and employed.						
45	Guo et al.	2020	To examine performance determinants	General	Quantitative	10,000 manufacturer firms in China	R&D	Performance	n/a	engagement 1) with the client, 2) with supplier	RBV	1)Negative, 2)Positive	Industrial Marketing Management
46	Guo et al.	2020	To examine financial slack effects on performance	SMME	Quantitative	SMME in China, 543 samples	Financial slack	Performance	R&D investment	1) Subsidy, 2) market	Institutional theory	1) Positive, partially mediated	International Journal of Production Economics
47	Hung et al.	2010	To test the influence of organizational learning on performance	General	Analytical-synthetic	Taiwan high-tech industry, 335 samples	IT, innovativeness, supply chain capability	Organizational performance	Organizational dynamic capability	n/a	Organization learning culture	Positive, mediated by dynamic capability	International Business Review journal
48	Hussein et al.	2016	To test the effect of learning organization culture on performance		Quantitative	High education institution in Malaysia	Learning organization	Organizational performance	n/a	n/a	Competitive advantage	Positive direct effect	Procedia Economics and Finance
49	Ibragimov et al	2019	explores the main drivers of productivity growth	Plantation	System dynamic model, qualitative	Oil palm data in Malaysia	R&D	Productivity growth	n/a	n/a	Modeling	Positive	Journal of Cleaner Production journal
50	Isensee et al.	2020	To test the link between organization culture, digitalization level, and	General	n/a	Literature review	Organizational culture	Level of environmental sustainability	Level of digitalization	n/a	n/a	Suggested framework	Journal of Cleaner Production

No	Author	Yr	Study Objective(s)	Industry	Study Design	Study Sample	IV	DV	Mediator	Moderator	Theory	Key Findings	Journal
			environmental sustainability level										
51	Chiappetta Jabbaur et al	2020	To examine determinants for sustainable performance	General	Quantitative	SME in Asia	innovation and entrepreneurial orientation, governmental actions, and lean manufacturing systems	Sustainable Business Performance	n/a	n/a	n/a	Literature review	International Journal of Production Economics
52	Chiappetta Jabbaur et al.	2015	To examine how the adoption of green supply chain management practices, including green sources, affects environmental and operational performance indicators	General	Qualitative	ISO 14000 Brazilian firms, 95 samples	Quality management	Green performance	Environmental management level, green purchasing, collaboration with customers	Firm size	Quality management	Positive	Transportation Research Part E
53	Chiappetta Jabbaur et al.	2017	To analyze the effects of external green supply chain management practices, (Cooperation with Customers and Green Purchasing) on the environmental performance	General	Qualitative	Brazilian organizations, 95 samples.	Cooperation with customers, green purchasing	Environmental Performance	External green supply chain management	Firm size	Ecological Modernisation and the Resource Dependence Theory	Positive and significant for all linkage	Industrial Marketing Management
54	Chiappetta Jabbour et al.	2020	To examine determinant of sustainable business performance; the principle of circular economy practices	General	Quantitative	Brazilian companies, 86 samples	Stakeholder pressure	Sustainable business performance - 3 dim	Motivators, barriers, principles of circular economy	ISO 9001, ISO-14000 certifications	Circular economy	The positive effect through the mediation of motivators and principles of the circular economy. All hypotheses are supported.	Journal of Environmental Management
55	Jia and Li	2020	To investigate the impact of three sources of uncertainty (economic policy,	General	Quantitative	6804 firms from 72 countries spanning 15 years,	Uncertainty: economic policy, climate change,	Sustainable business performance - 3 dim	n/a	Option for the delay in sustainability investment	Real option theory	Negative	Journal of Corporate Finance

No	Author	Yr	Study Objective(s)	Industry	Study Design	Study Sample	IV	DV	Mediator	Moderator	Theory	Key Findings	Journal
			climate change, and political instability) on sustainability performance				and political instability						
56	Jogaratnam et al.	2017	To examine the direct and indirect effects of organizational on market orientation (MO) and performance	Hospitality, restaurant	Quantitative	Restaurant in the US	1) innovative culture, 2) bureaucratic culture, 3) supportive culture	Performance - 1 dim	Market orientation	n/a	Market orientation, modern financial theory	Positive	Journal of Hospitality and Tourism Management
57	Kaja Rangus et al.	2017	To investigate the relationship between organizational characteristics, innovation, and performance	General	Quantitative	421 manufacturing and service firms	Decentralization	Business Performance	Employee involvement, Absorptive capacity, Innovation	n/a	Competitive advantage	Positive and significant through mediation	Technological Forecasting & Social Change
58	Kim and Hall	2020	To investigate whether sustainable restaurant practices increase diner loyalty.	Hospitality, restaurant	Quantitative	Customer data in Korea	Sustainable practices	Diner behavior (participation in reducing wastes and loyalty to the sustainable restaurant)	Hedonic value on waste reduction, the utilitarian value on waste reduction	Environmental concern	Value theory	Positive	Journal of Hospitality and Tourism Management
59	Koch et al.	2020	To examine the links between innovativeness, attitudes, and sustainable practice while testing perceived advantages of sustainable practice as a mediator	Service, hotel, hospitality	Quantitative	974 small and medium hotels and 62,766 reviews	1)Innovativeness, 2)Sustainability Attitude	Customer satisfaction	Perceived advantages of sustainable behavior, sustainable behavior	n/a	cognitive dissonance theory (Festinger,	1) Positive, 2) Positive, mediation is validated	International Journal of Hospitality Management
60	Kuzma et al.	2020	To analyze the effects of innovation on sustainable performance	General	Quantitative	Metadata	Innovation	Sustainable business performance	n/a		various	Positive	Journal of Cleaner Production

No	Author	Yr	Study Objective(s)	Industry	Study Design	Study Sample	IV	DV	Mediator	Moderator	Theory	Key Findings	Journal
61	Ladib and Lakhal	2015	To investigate alignment between business model and business strategy	ICT	Quantitative	220 ICT ventures	The business model on efficiency, business model on innovation, differentiation strategy, cost leadership strategy	Organizational performance - 1 dim	n/a	Environmental turbulence	Contingency theory	All are positive, moderation is negative	Journal of High Technology Management Research
62	Latan et al	2018	To examine the relationship between corporate environmental performance and corporate financial performance	General	Quantitative	ISO 14001 certified firms in Indonesia, 107 samples	1)environmental strategy, 2)perceived environmental uncertainty, 3) top management	Corporate financial performance	Environmental management accounting	n/a	Natural RBV	All linkages are supported (positive and significant)	Journal of Cleaner Production
63	Latan et al.	2018	To examine the effect of the combination of corporate environmental strategy, management commitment, and environmental uncertainty on corporate environmental performance	General	Quantitative	ISO 14001 certified companies listed on the Indonesia, 107 samples	Three resources: environmental strategy, perceived environmental uncertainty, top management's commitment	Corporate environmental performance	Environmental management accounting	n/a	NRBV	positive and significant	Journal of Environmental Management
64	Lee and Lin	2015	To evaluate the operating performance	Certified Public Accountant (CPA)	Quantitative	CPA in Taiwan, 833 samples for 2007, 909 samples for 2008, and 920 samples for 2009	the human, process, and customer capitals	Performance - 1 dim	n/a	n/a	Intellectual capital theory	human, process, and customer capitals are major dimensions that affect the CPA industry in maintaining good operating performance	Asia Pacific Management Review
65	Lee at al.	2020	To examine centralized knowledge structure -performance relationship and test moderating effect of team characteristics.	General	Quantitative	384 samples, South Korean international knowledge-intense teams	Knowledge centralization	Team performance	n/a	Business unit diversity, external knowledge source, cultural	Organizational learning theory and knowledge-based theory	Negative	Journal of Business Research

No	Author	Yr	Study Objective(s)	Industry	Study Design	Study Sample	IV	DV	Mediator	Moderator	Theory	Key Findings	Journal
										distance, geographic distance			
66	Leonidou et al.	2015	To examines the external and internal determinants of business strategy and its competitive advantage and performance.	Exporting company	Quantitative	Exporting companies in Turkey, 216 samples	foreign public concern and competitive intensity management awareness and organizational	Export market performance, export financial performance	An environmentally friendly business strategy, product differentiation competitive advantage, leadership competitive advantage	Firm size, experience, product type, market, technological intensity	Competitive advantage	Firm size (mod) - confirmed, competitive advantage (med) - confirmed, business strategy - positive significant	International Business Review
67	Lin and Lee		To test the effect of organizational learning on innovative behavior and work engagement	General	Quantitative	Paired samples within Southern Taiwan Science Park and 21 firms, 54 managers, and 511 staff in Taiwan	Organizational learning	Operating performance	work engagement	n/a	Spiral theory	Positive	Eurasia Journal of Mathematics, Science and Technology Education
68	Litukangas et al.	2019	To examine whether supply management innovativeness and orientation support sustainability performance	General	Quantitative	Finland large and medium firms	Innovativeness in supply management, supplier orientation	Innovative behavior	n/a	Company size	Dynamic capability view (DCV)	Positive	Journal of Purchasing and Supply Management
69	Liu	2017	To examines the effect of intellectual capital (IC) and performance relationship.	Cultural and creative organization	Quantitative	434 cultural organizations in Taiwan	Intellectual capital (Customer capital, human capital, and organizational capital)	Performance (organization performance and market performance)	Social capital	1) Business tie, 2) environment uncertainty	Social capital theory	Validated	Tourism Management

No	Author	Yr	Study Objective(s)	Industry	Study Design	Study Sample	IV	DV	Mediator	Moderator	Theory	Key Findings	Journal
70	Liu	2017	To examines the effect of exploratory and exploitative learning on competitive advantage and opportunity capture	Tourism	Quantitative	595 hotel managers and	1) Exploratory learning, 2) exploitative learning,	Competitive advantage, and opportunity capture,	Innovation behavior, human capital	Social capital, organizational capital	Intellectual capital theory	Both positive and significant, both moderating effects are proven	International Journal of Hospitality Management
71	Liu	2018	To investigate the relationships between social capital, organizational learning, and knowledge transfer.	Tourism	Quantitative	432 cultural organizations in Taiwan	Cognitive capital	Knowledge transfer	Structural capital, relational capital, exploitative learning, exploration learning	Absorptive capacity	Social network theory	Organizational learning (exploitative and explorative learning) is a critical linker between social capital and knowledge transfer.	Tourism Management
72	Liu et al.	2019	To examine the extent to which the impact of the overseas business knowledge transferred by returnee entrepreneurs on firm performance is conditional on institutional factors.	General	Quantitative	196 firms founded by returnees to China, 264 samples.	Transfer of overseas business knowledge	Performance (returnees venture)	n/a	informal institutional differences, local government policy support, local business infrastructure	Institutional theory	Informal institutional differences and local government policy jointly enhance the positive impact of overseas business knowledge. Well-developed local business infrastructure substitutes for the impact of informal institutional differences on the relationship between overseas business knowledge and returnee venture performance	International Business Review
73	Long et al.	2018	To explore and identify critical success factors and barriers for the journey to sustainability	Food	Qualitative	SME in the Dutch food industry	Method, leadership, innovation,	Success journey to sustainability	n/a	n/a	Organizational transformation	Collaboration, a clear narrative and vision, continual innovation, a sustainable foundation, profitability, and serendipitous external events are all critical success factors	Journal of Cleaner Production

No	Author	Yr	Study Objective(s)	Industry	Study Design	Study Sample	IV	DV	Mediator	Moderator	Theory	Key Findings	Journal
74	Lopez et al	2018	To investigate residents' attitudes towards tourism sustainability	Tourism	Quantitative	Peruvian archelogical tourism	Community involvement, community attachment	Sustainable business performance	Resident's support, perceived benefits	n/a	The socio-economic and cultural concept	All positive	Journal of Hospitality and Tourism Management
75	Marchand et al.	2019	To investigate social media resources and capabilities as strategic determinants of performance.	Social Media	Quantitative	Social media data	Resources and capabilities	Performance	n/a			Positive correlation.	International Journal of Research in Marketing
76	Maroufkhani et al.	2020	To validate the big data analytics adoption as a performance determinant	SME, general	Quantitative	171 Iranian SMEs	Big data	Financial performance and market performance	Big data analytics adoption	n/a	RBV	Positive and significant	International Journal of Information Management
77	Martin and Javalgi	2019	To examine knowledge-based view framework	Exporting ventures	Quantitative	Export ventures	Entrepreneurial orientation, the interaction between entrepreneurial orientation and knowledge-based resources	Performance (export venture)	Knowledge-based resources, marketing capabilities	n/a	RBV	Validated	Journal of Business Research
78	Martinez et al.	2019	To investigate the determinants of business failure	Manufacturing and Services	Quantitative	Spain firms, 2009–2015	1) Financial crisis, 2) Cooperation with vertical partners	Business failure	n/a	n/a	Firm survival	1) Positive, 2) Negative	Journal of Business Research
79	Martinez-Caro et al.	2020	To examine the effect of digital organizational culture on the performance	Quantitative		93 production centers of a multinational firm	Digital organizational culture	Organization performance	Business digitization, digital technologies value development	n/a	Competitive advantage concept	All hypotheses are supported	Technological Forecasting and Social Change
80	McDowell et al.	2018	To test the relationship between intellectual capital and performance	SME, general	Quantitative	460 SME owners	Intellectual capital, human capital, organizational capital	Performance	n/a	n/a	RBV	Positive relationship	Journal of Business Research
81	Milosevic.	2021	To investigate the relationship between professionalism and	Finance	Quantitative	French market and US market of venture	Task-specific human capital	Exit success of venture capital firms	n/a	n/a	Human and capital theory	Positive	Research Policy

No	Author	Yr	Study Objective(s)	Industry	Study Design	Study Sample	IV	DV	Mediator	Moderator	Theory	Key Findings	Journal
			portfolio success and fundraising			capital. 422 samples.							
82	Morioka and Carvalho	2016	To propose a conceptual framework with leveling: principles, core sustainable business elements, and the context factor.	General	Literature review	261 papers	Capabilities	Sustainable development and competitive advantage	Processes and practices, offering	internal and external context	n/a	Concept	Journal of Cleaner Production
83	Mousa and Othman	2020	To investigate the impact of green human resources on sustainable performance	Service, healthcare, hospitality	Quantitative	69 respondents of practitioners in Palestina	Green human capital practices (green hiring, green training, green performance & compensation)	Sustainable business performance - 3 dim	n/a	n/a	Green human resources management (GHRM)	Positive and significant	Journal of Cleaner Production
84	Naciti et al.	2019	To examine whether the composition of the Board of Directors affects firms' sustainability performance	General	Quantitative	362 firms in 46 different countries	Board of director composition	Sustainable business performance - 1 dim	n/a	n/a	Agency theory and stakeholder theory	Positive; more varies is stronger	Journal of Cleaner Production
85	Naqshbandi and Tabche	2018	To prove the mediating effect of organizational learning culture in leadership and innovation relationship		Quantitative	Indian companies	Empowering leadership	1) Inbound open innovation, 2) outbound open innovation	Organizational learning culture	Absorptive capacity	Open innovation, knowledge-oriented leadership	Negative on the impact of an organizational learning culture	Technological Forecasting and Social Change
86	Niesten et al.	2017	To study the potential collaboration among firms and its benefits through the society	General	Literature review	Literature	Stringent environmental regulations may hinder economic performance and detrimental effects on environmental performance	Sustainable business performance - 1 dim	Governance structures (markets, collaboration, hierarchies)	n/a	Institutional theory, transaction cost economic (TCE), RBV	Concept	Journal of Cleaner Production

No	Author	Yr	Study Objective(s)	Industry	Study Design	Study Sample	IV	DV	Mediator	Moderator	Theory	Key Findings	Journal
87	Okongwu et al.	2016	To study the model of performance determinants	Service, supply chain	Analytical model and simulations	Synthetic data for simulation	Integration of supply chain planning	Performance - 1 dim	n/a	n/a	Supply chain operations reference model and customer order decoupling point	Analytical model	Journal of Manufacturing Systems
88	Oriade et al.	2021	To examine the relationship between management practice and sustainability awareness	Quantitative		The hospitality industry in Nigeria	Management practice	Sustainability awareness	organizational culture	n/a	Situated cognition	Positive, mediated by organizational culture	International Journal of Hospitality Management
89	Othman et al	2015	To examine the effects of organization tangible resources on performance	General, SME	Quantitative	SME in Malaysia	tangible corporate resources (physical resources, current assets, business finance), liability	Performance - 1 dim	n/a	n/a	RBV	Positive	Procedia - Social and Behavioral Sciences
90	Panizzon et al.	2020	To examine the determinants of new product development ability	Exporting companies	Quantitative	167 manufacturing export companies	Learning capability	Performance (new product development ability)	Organizational creativity, International entrepreneurial orientation, reconfiguration capability, and technological Capability	n/a	Learning capability concept	Positive	Journal of Engineering and Technology Management - JET-M
91	Paraschi et al.	2019	To explore performance determinants	Service, Airport	Quantitative	137 airports from 90 countries	(1) Low season, size, (2) mix ownership	Performance (airport)	n/a	n/a	Airport abiotic factor	(1) Positive, (2) negative	Transport Policy
92	Peterson et al.	2020	To explore the factors that influence consumer support for	General	Quantitative	US (304 respondents	1)consumer nature-based values 2) attitude toward firm	Sustainable business performance	n/a	n/a	Value belief norm theory	Positive	Sustainable Production and Consumption

No	Author	Yr	Study Objective(s)	Industry	Study Design	Study Sample	IV	DV	Mediator	Moderator	Theory	Key Findings	Journal
			sustainable business performance				benevolence 3) ethicality of firm						
93	Phillips et al.	2015	To validate determinants of hotel performance	Service, hotel	artificial neural network	235 Swiss hotel, 2008-2010 and reviews	1)Regional room rating, 2) Room quality, positive regional review, hotel regional reputation	Performance	n/a	n/a	Risk theory	1) Positive, 2)Negative	Tourism Management journal
94	Prasad et al	2019	To examine the critical success factor of supply chain management and organization performance	General	Quantitative	145 industry practitioners	Organization external environment	Sustainability performance - 1 dim	organizational internal environment, sustainability supply chain management	n/a	Institutional theory	Positive	Transportation Research Procedia
95	Protogerou et al.	2017	To explore the effect of diverse resources and competencies on performance	General	Empirical analysis	In a survey in Europe, 3692 samples	Human capital	Innovative performance	n/a	n/a	RBV	Positive	Research Policy
96	Queiros et al.	2019	To assess high growth business determinants.	General	Quantitative	35 OECD countries	1) Firm size, 2) Masculinity	Business growth	n/a	n/a	Business growth concept	1) Positive significant, 2) negative	Journal of Innovation & Knowledge
97	Raut et al.	2019	to analyze the predictors of sustainable business performance through big data analytics	General	Quantitative	Indian professional experts, 316 samples	Leadership, policy, supplier integration, internal business process, and customer integration	Sustainable business performance - 1 dim	Big data	n/a	Supply chain	Positive	Journal of Cleaner Production
98	Reid et al.	2018	To suggest knowledge improvement practice to performance	General	Review	n/a	Enrichment through reading popular business books	Organization performance - 1 dim	n/a	n/a	RBV	Best practice suggestion	Business Horizons
99	Rotondo	2019	To explore the influence of integrating social sustainability objectives to the	Air transportation	Qualitative	4 low-cost international carriers	Discontinuities crisis and management & control system	Financial performance and sustainable innovation	integration of social sustainability in the BM	n/a	Entrepreneurship theory	Concept	Journal of Cleaner Production

No	Author	Yr	Study Objective(s)	Industry	Study Design	Study Sample	IV	DV	Mediator	Moderator	Theory	Key Findings	Journal
			financial performance, sustainable innovation, and resilience										
100	Seles et al.	2018	To examine the response to the climate crisis while examining the implications of big data management	General	Literature review	Literature	Climate change crisis, Big data management	Environment performance and business performance	n/a	economic crisis	Contingency theory, dynamic capability theory	All hypotheses supported	Ecological Economics
101	Shad et al	2019	To examines the moderating effect of sustainability reporting practices on the relationship between enterprise risk management and business performance.	General	Quantitative	Thomson Reuters DataStream	Enterprise risk management	Firm performance	n/a	Sustainability reporting	Stakeholders Theory and the Modern Portfolio Theory	Tested	Journal of Cleaner Production
102	Shahbaz et al.	2020	To examine the relationship between board attributes, CSR engagement, and performance.	General	Quantitative	Thomson Reuters data, 2011-2018	1) Board independence, board gender diversity, board diligence, tributes	CSR performance	n/a	n/a	Stakeholder theory	1) Negative	Energy Policy
103	Tan et al.	2015	To examine the relationship between sustainability performance and business competitiveness	Construction	Quantitative	Dow Jones Sustainability Indices (DJSI) by S&P Dow Jones Indices and RobecoSAM	1) Revenue, 2) Revenue growth	Sustainable business performance	n/a	n/a	Sustainability performance - economic success relationship	Sustainability performance - international revenue relationship is inverse U-shape. Sustainability performance - international revenue growth is U-shape.	Journal of Cleaner Production
104	Tortorella et al.	2020	To test the relation between industry 4.0 and performance.	General	Quantitative	Firms that conduct digital transformation toward Industry 4.0, 135 samples.	Industry 4.0 base technologies	Operational performance	Organizational learning at the individual, team, and organization level	n/a	Learning organization concept (Senge)	Learning capabilities at an organization level positively mediate the impact of I4.0 for achieving higher operational performance levels.	Intern. Journal of Production Economics

No	Author	Yr	Study Objective(s)	Industry	Study Design	Study Sample	IV	DV	Mediator	Moderator	Theory	Key Findings	Journal
105	Ukko	2019	To examines the role of a sustainability strategy in the relation between a digital business strategy and financial performance	General	Quantitative	SMEs, services, and manufacturers in Findland, 280 samples	Managerial capability (1) and Operational capability (2)	Financial performance	n/a	Sustainability strategy	RBV	1) Positive promotor, 2) Negative promotor	Journal of Cleaner Production
106	Upadhyay & Kumar.	2020	To test big data analytics capability role in organizational culture and performance relationship	Quantitative	Quantitative	IT companies in India, 800 samples	Internal analytics knowledge	Firm performance	organizational culture, big data analytics capability	n/a	RBV, dynamic capability theory, socio-materialism theory	Positive and significant through mediating effect of big data analytics capability. Positive and significant through the mediation effect of organizational culture	International Journal of Information Management
107	Vargas	2016	To test the effect of organizational learning on performance and business innovation	General	Analytical-synthetic	analytical-synthetic methodology	Leadership style	Innovation, performance, and competitiveness	organizational learning	n/a	Leadership theory	Suggested leadership style to promote an organizational learning process	Procedia - Social and Behavioral Sciences
108	Welsh et al.	2018	To investigate the determinants of business performance	General	Quantitative	Data from Egypt	Human capital (education level, management skill, age, social networks' support, family organizational support, gender-related problems,	Performance (4 dim)	n/a	financial business startup	Institutional theory	Positive	Journal of Business Research
109	Wut and Ng	2015	To explore the relationship between business performance and CSR practices	General	Quantitative	Major China enterprises listed in Hong Kong	CSR practice	Sustainable business performance	n/a	financial business startup	Upper Echelons Theory	Positive	Procedia - Social and Behavioral Sciences
110	Yasir et al.	2020	To examine the effect of environmental orientation on environmental performance and test the mediating role of green business strategies	General	Quantitative	Manufacturing industries of Pakistan, 126 samples	environmental orientation	Environment performance	green business strategies	n/a	RBV	Positive Mediator is tested	Journal of Cleaner Production

No	Author	Yr	Study Objective(s)	Industry	Study Design	Study Sample	IV	DV	Mediator	Moderator	Theory	Key Findings	Journal
111	Yeniyurt et al.	2019	Retrospective and future research direction on IT, innovativeness, and supply chain as determinants of business performance	General	Review/meta data analysis	Past publication	IT, innovativeness, supply chain capability	Business performance	n/a	n/a	n/a	n/a	Industrial Marketing Management
112	Yuen et al.	2019	To examine internal and external factors that moderate the relationship between the identified shipping capabilities and business performance	Shipping	Quantitative	shipping company in Singapore, 225 samples	sustainable shipping exploitation capability and sustainable shipping exploration capability	Business Performance	Organizational slack and environmental uncertainty	n/a	RBV	Positive	Transport Policy
113	Yuen et al.	2020	To analyze the effects of various stakeholders' participation on sustainability integration and organizational performance of	Shipping	Quantitative	Maritime transport firms, 156 samples	Stakeholder participation: 1) internal, and 2) external value chain, 3) regulatory and 4) public	Organizational performance	Sustainability integration	n/a	Structure conduct performance paradigm	Positive	Transport Policy
114	Yusliza et al.	2020	To examine green intellectual capital and sustainable performance relationship	General	Quantitative	112 manufacturers in Malaysia	Green intellectual capital	Sustainable business performance - 3 dim	n/a	n/a	RBV	Positive	Journal of Cleaner Production
115	Zhou and Li	2020	To explore the impact of supply chain practices and quality management on business performance	General	Quantitative	138 SMEs in China	1) Supply chain, 2) quality management	Innovation Performance	n/a	n/a	Institutional theory	1) Positive significant, 2) positive significant	International Journal of Production Economics
116	Zimmermann et al.	2020	To examine how innovation capabilities and supply chain strategies affect business performance.	General	Quantitative	329 firms in Portugal and Brazi	Core innovation capabilities, Supplementary innovation capabilities	Performance (economic and environmental)	Supply chain strategy as moderator	1) Lean strategy, 2) agile strategy	RBV	Positive	Journal of Purchasing and Supply Management

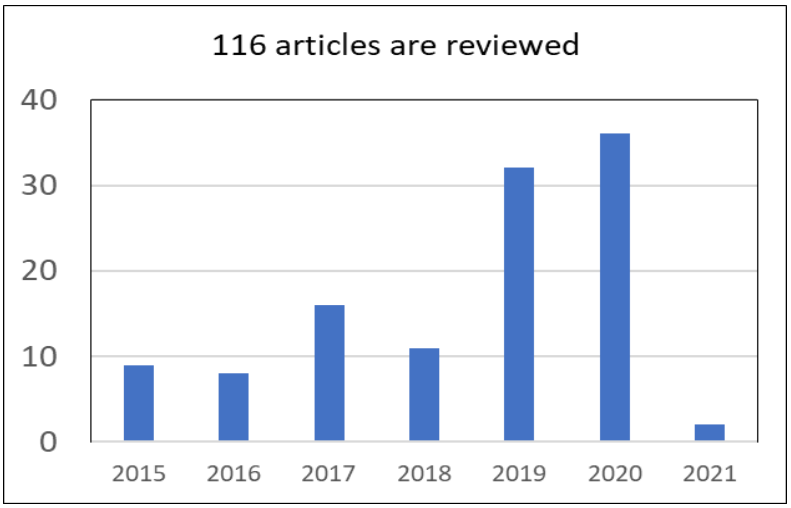
Appendix L Theories Used in Literature

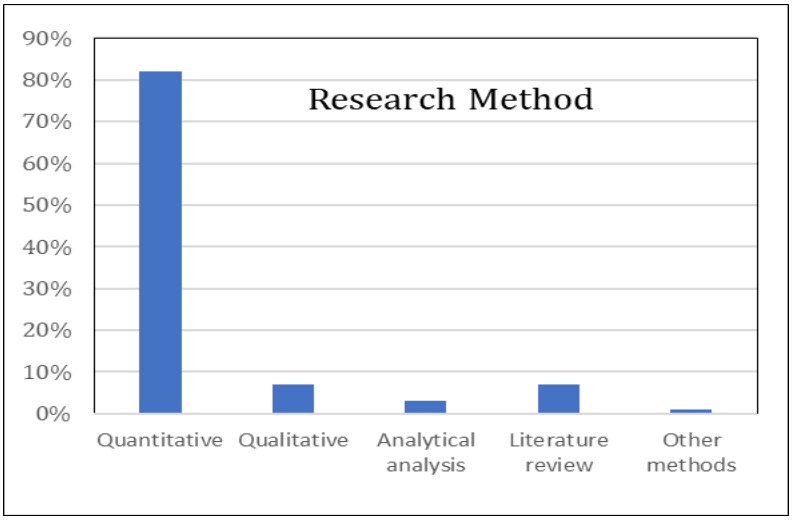
No	Theory	Number of articles	Authors (Year)
1	Business growth concept	1	Queiros et al. (2019)
2	Circular Economy	1	Chiappetta Jabbour (2020)
3	Cognitive dissonance theory	1	Koch et al. (2020)
4	Competitive advantage	5	Martínez-Caro et al.(2020), Garay et al. (2017), Rangus & Slavec (2017), Hussein et al.(2016), Leonidou et al. (2015),
5	Contingency theory	1	Ladib & Lakhal (2015)
6	Dynamic capability theory	3	Seles et al,. (2018), Upadhyay & Kumar (2020), Lintukangas et et. (2019)
7	Entrepreneurship theory	1	Rotondo et al. (2019)
8	Extended Resource-Based View (ERBV)	1	Chen et al. (2019)
9	Institutional theory	10	Elango & Dhandapani (2020), Guo et al.(2020), Prasad et al.(2020), Zhou & Li (2020), Alam et al. (2019), Ding et al. (2019), Xiaohui et al. (2019), Welsh et al. (2018), Damert et al.(2017), Niesten et al.(2017)
10	Intellectual capital theory	1	Lee & Lin (2015)
11	Internationalization process theory	1	Escandon_Barbosa et al. (2019)
12	Interpersonal behavior theory	1	Chege & Wang (2020)
13	Knowledge-based theory	1	Lee et al. (2020)
14	Leadership theory	1	Vargas et al. (2018)
15	Legitimacy theory	1	Abdullah et al. (2020)
16	Market orientation	1	Jogaratnam et al. (2017)
17	Modern financial theory	1	Jogaratnam et al. (2017)
18	Modern portfolio theory	1	Shad et al. (2019)
19	Natural resource-based theory (NRBV)	1	Latan et al. (2018)
20	Opportunity based concept	1	Fellnhofer (2017)
21	Organizational learning culture/ theory	4	Gomes & Wojahn (2017), Hung et al. (2010), Lee et al. (2020), Tortorella et al. (2020)
22	Organizational transformation	1	Long et al. (2018)
23	Quality management	1	Chiappetta Jabbour (2015), Gomes et al. (2020)
24	Real option theory	1	Jia & Li (2020)

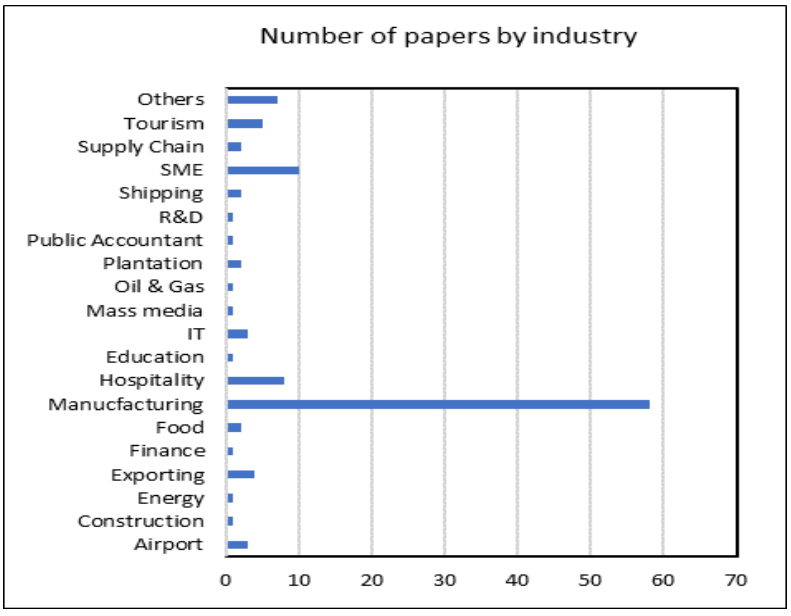
Appendix K Theories Used in Literature (continued)

No	Theory	Number of articles	Authors (Year)
25	Resource-based view (RBV)	27	Ch'ng et al. (2021), Marchand et al. (2020), Maroufkhani et al.(2020), H. Cho & Lee (2020), Guo et al.(2020), Ali et al. (2020), Eller et al.(2020), Asadi et al.(2020), Upadhyay & Kumar (2020), Yasir et al.(2020), Yong et al.(2020), Zimmermann et al. (2020) Aydiner et al.(2019), Caseiro & Coelho (2019), L. Chen et al. (2019), Fernando et al.(2019), Martin & Javalgi (2019), Ukko et al. (2019), Yuen et al.(2019), McDowell et al. (2018), Reid et al.(2018), Latan et al. (2018), Latan et al.(2018), Elijido-Ten (2017), Protogerou et al. (2017), De Oliveira Brasil et al.(2016), Othman et al. (2015)
26	Resource-dependent theory (RDT)	5	Chiappetta Jabbour et al.(2020), Chang et al.(2019), Cheah et al.(2019), Abreu et al. (2017), Chung et al.(2016)
27	Risk theory	1	Phillips ET AL. (2019)
28	Self-determination theory	1	Bento et al. (2019)
29	Social capital theory	7	Balogun et al. (2020), Donbesuur et al. (2020), Upadhyay & Kumar (2020), López et al.(2018), Godoy-Durán et al. (2017), Liu (2017), Liu (2018),
30	Spiral theory	1	Lin & Lee (2017)
31	Stakeholder theory	7	Shahbaz et al.(2020), Aksoy et al. (2020), Cantele & Cassia (2020), Chams & García-Blandón (2019), Naciti (2019), Shad et al.(2019), Awan et al.(2017)
32	Upper Echelon theory	1	Wut & Ng (2015)
33	Structure conduct performance paradigm	1	Bali et al. (2019)
34	Technology transfer model	1	Chege et al. (2019)

Appendix M Literature Review Statistics







Appendix N Questionnaire Responses by Date and Time

A total number of 220 samples were collected during 2 months (22 December 2020 – 22 February 2021). These tables show the responses by date and time.

No	Day	Date and time
1	Tuesday	12/22/2020 18:13:57
2	Tuesday	12/22/2020 18:23:33
3	Tuesday	12/22/2020 18:24:01
4	Tuesday	12/22/2020 18:27:42
5	Tuesday	12/22/2020 18:29:58
6	Tuesday	12/22/2020 18:31:11
7	Tuesday	12/22/2020 18:31:29
8	Tuesday	12/22/2020 18:35:41
9	Tuesday	12/22/2020 18:41:51
10	Tuesday	12/22/2020 18:49:11
11	Tuesday	12/22/2020 18:49:26
12	Tuesday	12/22/2020 18:59:10
13	Tuesday	12/22/2020 19:21:47
14	Tuesday	12/22/2020 19:41:16
15	Tuesday	12/22/2020 19:43:10
16	Tuesday	12/22/2020 19:56:08
17	Tuesday	12/22/2020 20:12:49
18	Tuesday	12/22/2020 20:12:05
19	Tuesday	12/22/2020 20:23:52
20	Tuesday	12/22/2020 20:50:10
21	Tuesday	12/22/2020 22:58:19
22	Wednesday	12/23/2020 7:50:41
23	Wednesday	12/23/2020 4:15:39
24	Wednesday	12/23/2020 6:52:57
25	Wednesday	12/23/2020 8:36:47
26	Wednesday	12/23/2020 9:04:26
27	Wednesday	12/23/2020 8:53:23
28	Wednesday	12/23/2020 9:42:51
29	Wednesday	12/23/2020 9:43:12
30	Wednesday	12/23/2020 9:55:40
31	Wednesday	12/23/2020 11:27:25
32	Wednesday	12/23/2020 11:31:55
33	Wednesday	12/23/2020 11:45:11
34	Wednesday	12/23/2020 12:00:50
35	Wednesday	12/23/2020 12:06:33
36	Wednesday	12/23/2020 13:34:34
37	Wednesday	12/23/2020 13:48:21
38	Wednesday	12/23/2020 14:12:15
39	Wednesday	12/23/2020 16:43:48
40	Wednesday	12/23/2020 17:08:54
41	Wednesday	12/23/2020 18:21:04
42	Wednesday	12/23/2020 19:16:24
43	Wednesday	12/23/2020 20:11:51
44	Thursday	12/24/2020 7:15:27
45	Thursday	12/24/2020 7:18:21
46	Thursday	12/24/2020 7:43:59
47	Thursday	12/24/2020 9:02:58
48	Thursday	12/24/2020 9:09:57
49	Thursday	12/24/2020 9:10:09
50	Thursday	12/24/2020 9:12:23
51	Thursday	12/24/2020 9:37:18
52	Thursday	12/24/2020 9:49:30
53	Thursday	12/24/2020 9:54:47
54	Thursday	12/24/2020 9:58:41
55	Thursday	12/24/2020 10:05:10
56	Thursday	12/24/2020 10:07:12
57	Thursday	12/24/2020 10:16:57
58	Thursday	12/24/2020 10:36:57
59	Thursday	12/24/2020 10:47:56
60	Thursday	12/24/2020 10:50:43
61	Thursday	12/24/2020 11:04:36
62	Thursday	12/24/2020 11:29:11
63	Thursday	12/24/2020 14:19:07
64	Thursday	12/24/2020 15:56:04
65	Thursday	12/24/2020 17:28:17
66	Thursday	12/24/2020 17:58:03
67	Thursday	12/24/2020 18:04:02
68	Thursday	12/24/2020 19:24:18
69	Thursday	12/24/2020 20:39:28
70	Thursday	12/24/2020 20:53:27
71	Thursday	12/24/2020 21:24:47
72	Thursday	12/24/2020 23:18:03
73	Friday	12/25/2020 6:59:51
74	Friday	12/25/2020 7:20:13
75	Friday	12/25/2020 7:45:08
76	Friday	12/25/2020 8:55:45
77	Friday	12/25/2020 9:02:56
78	Friday	12/25/2020 11:41:00
79	Friday	12/25/2020 10:17:13
80	Friday	12/25/2020 10:31:57
81	Friday	12/25/2020 12:11:34
82	Friday	12/25/2020 12:31:03
83	Friday	12/25/2020 12:37:27
84	Friday	12/25/2020 13:58:58
85	Friday	12/25/2020 15:12:37
86	Friday	12/25/2020 16:12:23
87	Friday	12/25/2020 17:59:07
88	Friday	12/25/2020 18:20:11
89	Saturday	12/26/2020 0:16:29
90	Saturday	12/26/2020 0:19:08
91	Saturday	12/26/2020 4:28:30
92	Sunday	12/27/2020 15:32:51
93	Sunday	12/27/2020 15:58:52
94	Sunday	12/27/2020 18:12:31
95	Sunday	12/27/2020 18:23:18
96	Monday	12/28/2020 10:02:37
97	Monday	12/28/2020 10:39:16
98	Monday	12/28/2020 17:42:06
99	Monday	12/28/2020 20:27:22
100	Monday	12/28/2020 20:53:38
101	Monday	12/28/2020 21:10:49
102	Monday	12/28/2020 21:48:19
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105	Tuesday	12/29/2020 7:52:04
106	Tuesday	12/29/2020 8:12:47
107	Tuesday	12/29/2020 8:33:09
108	Tuesday	12/29/2020 9:56:10
109	Tuesday	12/29/2020 11:34:30
110	Tuesday	12/29/2020 12:35:46
111	Tuesday	12/29/2020 12:43:17
112	Tuesday	12/29/2020 12:44:49
113	Tuesday	12/29/2020 12:49:02
114	Tuesday	12/29/2020 12:53:54
115	Tuesday	12/29/2020 18:29:00
116	Wednesday	12/30/2020 10:31:08
117	Wednesday	12/30/2020 7:16:40
118	Wednesday	12/30/2020 8:58:08
119	Wednesday	12/30/2020 9:23:31
120	Wednesday	12/30/2020 9:57:12
121	Wednesday	12/30/2020 10:10:54
122	Wednesday	12/30/2020 12:17:20
123	Wednesday	12/30/2020 16:35:40
124	Wednesday	12/30/2020 16:36:33
125	Wednesday	12/30/2020 18:00:16
126	Wednesday	12/30/2020 18:46:10
127	Wednesday	12/30/2020 19:20:34
128	Wednesday	12/30/2020 22:28:22
129	Thursday	12/31/2020 10:27:42
130	Thursday	12/31/2020 11:07:18
131	Thursday	12/31/2020 13:36:47
132	Thursday	12/31/2020 14:21:41
133	Thursday	12/31/2020 15:17:26
134	Thursday	12/31/2020 15:30:41
135	Thursday	12/31/2020 15:31:58

Appendix N Questionnaire Responses by Date and Time (continued)

No	Day	Date and time	No	Day	Date and time
136	Thursday	12/31/2020 15:47:37	181	Monday	1/4/2021 14:07:42
137	Thursday	12/31/2020 15:49:01	182	Monday	1/4/2021 15:32:12
138	Thursday	12/31/2020 16:19:36	183	Monday	1/4/2021 15:37:17
139	Thursday	12/31/2020 16:25:03	184	Tuesday	1/5/2021 11:06:01
140	Thursday	12/31/2020 16:25:04	185	Tuesday	1/5/2021 11:12:13
141	Thursday	12/31/2020 17:15:29	186	Tuesday	1/5/2021 11:27:11
142	Thursday	12/31/2020 17:16:50	187	Tuesday	1/5/2021 13:33:57
143	Thursday	12/31/2020 17:49:55	188	Tuesday	1/5/2021 14:22:10
144	Thursday	12/31/2020 18:02:38	189	Tuesday	1/5/2021 14:25:24
145	Thursday	12/31/2020 18:33:44	190	Tuesday	1/5/2021 14:53:01
146	Thursday	12/31/2020 18:35:07	191	Tuesday	1/5/2021 15:24:42
147	Thursday	12/31/2020 19:31:35	192	Tuesday	1/5/2021 16:06:51
148	Thursday	12/31/2020 20:18:52	193	Tuesday	1/5/2021 16:53:16
149	Thursday	12/31/2020 20:23:20	194	Tuesday	1/5/2021 19:41:59
150	Thursday	12/31/2020 21:20:55	195	Tuesday	1/5/2021 20:18:11
151	Thursday	12/31/2020 22:18:21	196	Tuesday	1/5/2021 21:32:37
152	Thursday	12/31/2020 23:35:25	197	Wednesday	1/6/2021 3:49:24
153	Friday	1/1/2021 6:37:47	198	Wednesday	1/6/2021 8:10:55
154	Friday	1/1/2021 8:07:01	199	Wednesday	1/6/2021 8:31:25
155	Friday	1/1/2021 8:56:33	200	Wednesday	1/6/2021 8:33:19
156	Friday	1/1/2021 10:10:41	201	Wednesday	1/6/2021 8:36:41
157	Friday	1/1/2021 14:53:54	202	Wednesday	1/6/2021 8:58:33
158	Saturday	1/2/2021 7:56:08	203	Wednesday	1/6/2021 9:51:48
159	Saturday	1/2/2021 8:21:22	204	Wednesday	1/6/2021 10:00:15
160	Saturday	1/2/2021 9:01:09	205	Wednesday	1/6/2021 10:50:47
161	Saturday	1/2/2021 9:15:21	206	Wednesday	1/6/2021 14:29:38
162	Saturday	1/2/2021 9:17:35	207	Wednesday	1/6/2021 20:18:04
163	Saturday	1/2/2021 9:21:05	208	Thursday	1/7/2021 13:24:45
164	Saturday	1/2/2021 10:53:28	209	Friday	1/8/2021 9:55:51
165	Saturday	1/2/2021 11:42:49	210	Friday	1/8/2021 16:07:53
166	Saturday	1/2/2021 12:23:35	211	Thursday	1/14/2021 22:22:30
167	Saturday	1/2/2021 12:54:07	212	Thursday	1/21/2021 20:58:39
168	Saturday	1/2/2021 13:38:39	213	Saturday	1/30/2021 10:05:24
169	Saturday	1/2/2021 15:03:05	214	Monday	2/1/2021 10:46:22
170	Saturday	1/2/2021 15:39:24	215	Monday	2/1/2021 11:05:49
171	Saturday	1/2/2021 17:59:03	216	Tuesday	2/2/2021 15:55:14
172	Saturday	1/2/2021 18:57:45	217	Saturday	2/6/2021 16:15:25
173	Saturday	1/2/2021 19:07:16	218	Saturday	2/6/2021 17:21:26
174	Saturday	1/2/2021 21:33:20	219	Saturday	2/6/2021 17:44:47
175	Saturday	1/2/2021 22:26:04	220	Monday	2/22/2021 22:35:18
176	Sunday	1/3/2021 8:04:02			
177	Sunday	1/3/2021 8:324:02 AM			
178	Sunday	1/3/2021 10:59:48			
179	Sunday	1/3/2021 19:33:54			
180	Monday	1/4/2021 11:01:21			

Appendix O AVE and CR Calculation High Order Construct

3 Items	Loading	Loading^2	Error Variance = 1- Loading^2
Economic Performance	0.602	0.362	0.638
Environmental Performance	0.897	0.805	0.195
Social Performance	0.877	0.769	0.231
Total or Σ	2.376	1.936	1.064
(Σ Loadings)^2	5.645		
(Σ Loadings)^2 + Σ Error Variance			6.709
AVE = (Σ Loading^2)/3		**0.645**	
CR = (Σ Loading)^2 / ((Σ Loading)^2 + Σ Error Variance)			**0.841**

Appendix P Standard Deviation Formula

$$\text{standard deviation } \sigma = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n-1}}$$

$$\text{variance} = \sigma^2$$

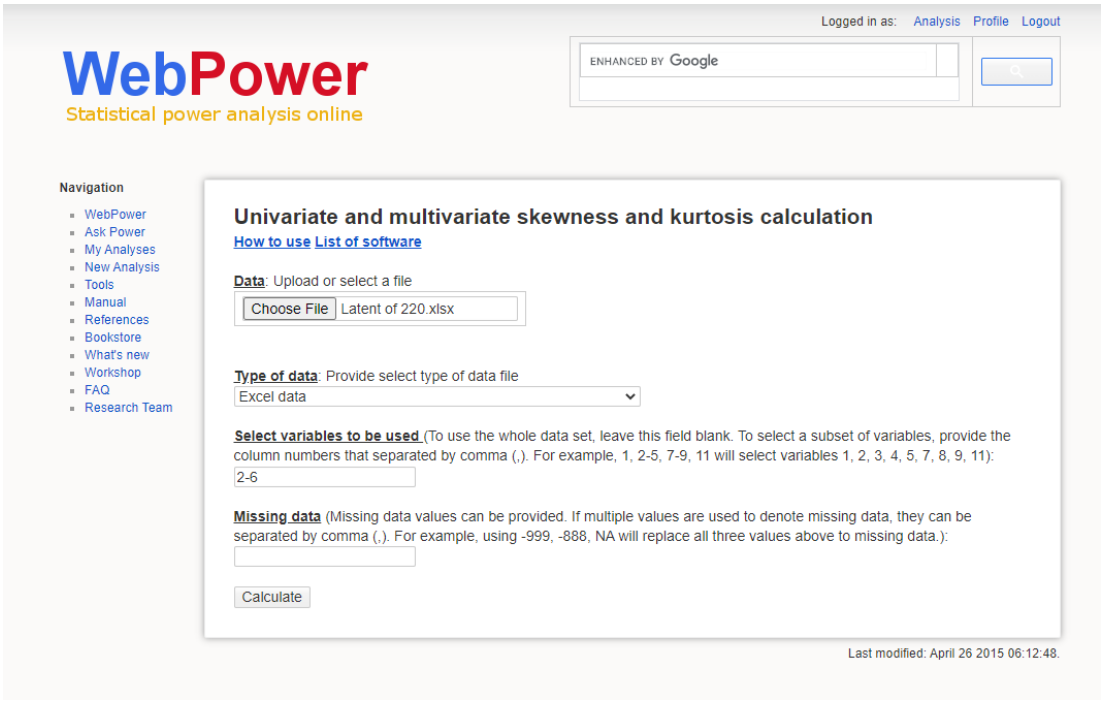
$$\text{standard error } (\sigma_{\bar{x}}) = \frac{\sigma}{\sqrt{n}}$$

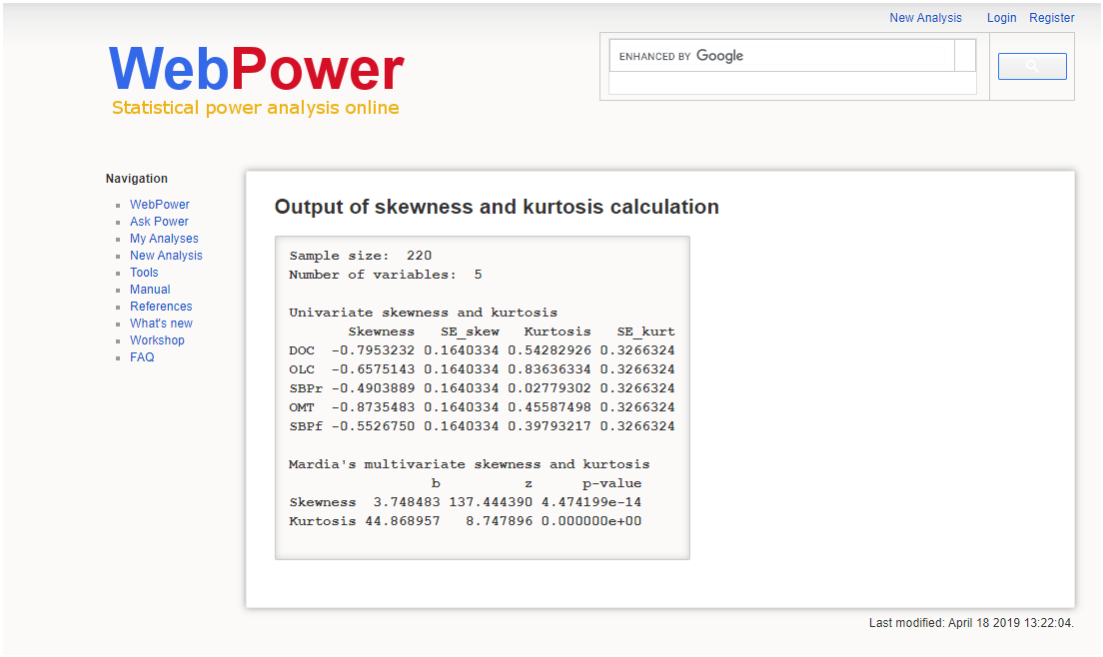
where:

$\bar{x}$ = the sample's mean

n = the sample size

Appendix Q Multivariate Skewness and Kurtosis Check





Appendix R Outer Variance Inflated Factors (VIF) Values

Construct	Items	VIF
Organizational Learning Culture	OLC3	1.615
	OLC4	1.550
	OLC5	1.693
	OLC6	1.812
	OLC7	2.026
	OLC8	1.696
	OLC9	1.831
	OLC10	2.113
Digital Organizational Culture	DIG1	1.916
	DIG2	1.961
	DIG3	1.797
	DIG4	2.084
	DIG5	1.657
Sustainable Business Practices	PRAC2	1.593
	PRAC3	1.588
	PRAC4	1.875
	PRAC5	1.778
	PRAC6	1.700
Oil Market Turbulence	OMT1	1.477
	OMT2	1.820
	OMT3	1.952
	OMT4	2.215
	OMT5	1.695
Sustainable Business Performance	ECON1	4.248
	ECON2	4.341
	ECON3	2.020
	ECON4	1.745
	ECON5	1.346
	ENV1	2.863
	ENV2	3.511
	ENV3	2.096
	ENV4	2.575
	ENV5	2.196
	SOC1	2.444
	SOC2	2.273
	SOC3	2.488
	SOC4	2.356
	SOC5	1.828

Appendix S Q2 Predict By Shmueli (2019)

Appendix T Title Page of Published Article

Journal of Cleaner Production 294 (2021) 126231

Contents lists available at ScienceDirect

Journal of Cleaner Production

journal homepage: www.elsevier.com/locate/jclepro

Examining sustainable business performance determinants in Malaysia upstream petroleum industry

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ABSTRACT

This paper highlights the study on examining sustainable business performance determinants includes proposed variables of organizational learning culture and digital organizational culture. Organizational learning culture and digital organizational culture have been used in some previous studies but they were not recognized as determinants of sustainable business performance. The organizational learning culture is relevant in anticipating challenges and pressures while the digital organizational culture is relevant to the digital transformation. The empirical synergy of both supports sustainable business performance is quantitatively tested using the PLS-SEM tool and inputs of 207 samples collected from the Malaysia upstream petroleum industry. The results show that supports from organizational learning culture and digital organization culture on sustainable business performance are positive and significant. Digital organizational culture mediates the relationship between organizational learning culture and sustainable business performance. This research enriches the theory and literature on sustainable business performance and the role of organizational learning culture and digital organizational culture. It also provides fundamentals for industry practitioners and policymakers for relevant decision making and improvement.

1. Introduction

The issue of sustainable business performance has been a constant debate in the literature for the past few decades (Banker et al., 2000; Ghosh and Wu, 2012; Ittner and Larcker, 1998; Lambert, 1998; Salameh et al., 2011). It has evolved from financial performance to non-financial performance (Filios, 1984; Ghosh and Wu, 2012; Kreps, 1962; Spicer, 1978; Sturdivant and Ginter, 1977; Ullmann, 1985). Recent literature has provided adequate evidence for a much greater evolution of performance indicators in defining what it is meant to have achieved a sustainable business performance (Morioka and Carvalho, 2016). While the issue has been gaining increasing momentum among scholars and practitioners (Chiappetta Jabbour et al., 2020; Dhanesh, 2020; Geissdoerfer et al., 2018; George et al., 2016; Latan et al., 2018; Mojarad et al., 2018; Morioka and Carvalho, 2016; Nortje, 2014; Raucci and Tarquinio, 2015, 2020; Theodoulidis et al., 2017) and gas industry has been facing greater criticisms for not being able to uphold its sustainable performance in the recent past (Grasso, 2019).

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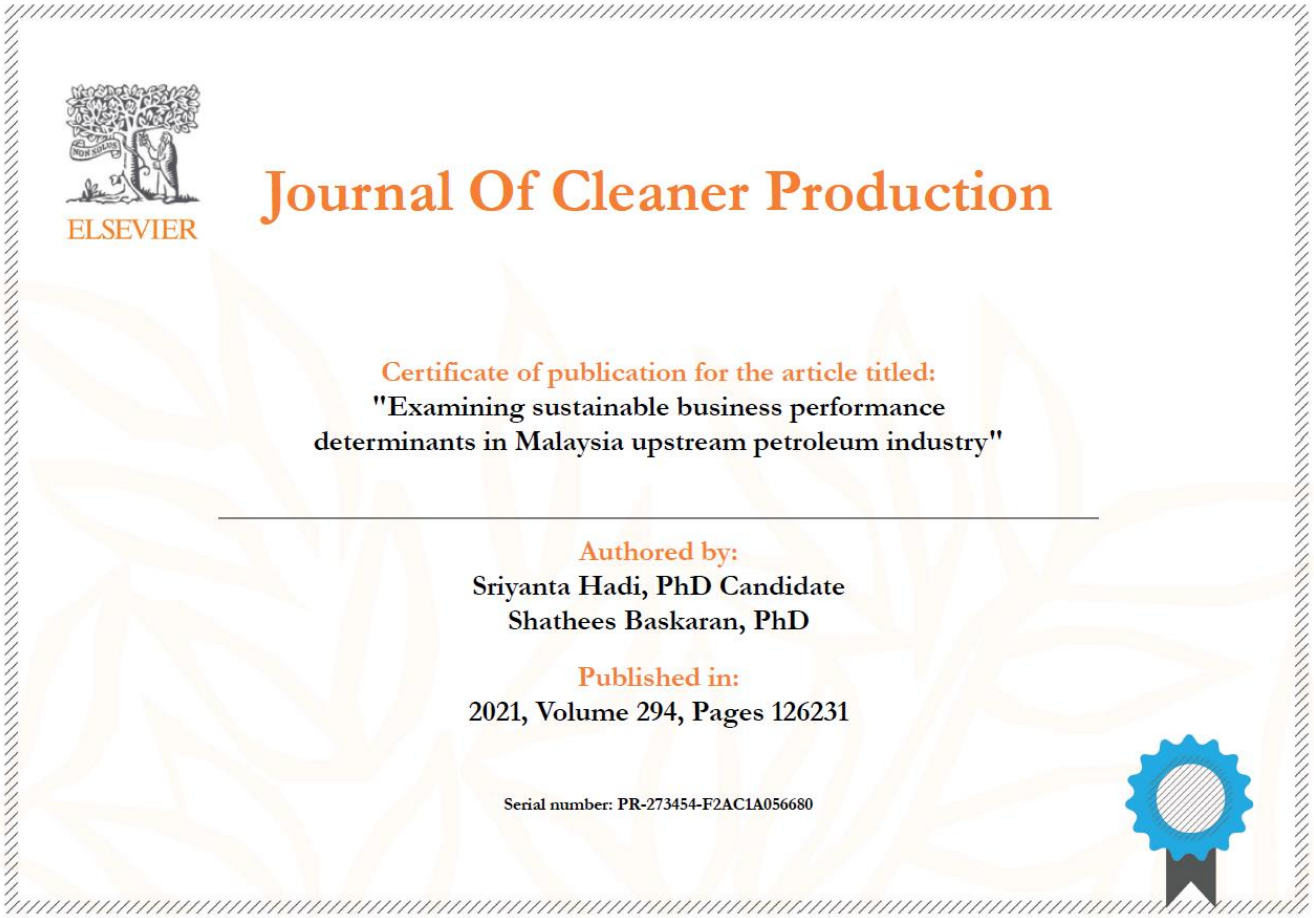
0959-6526/

While the industry characteristics of oil and gas are very different from many other heavy industries (George et al., 2016), its sustainable business performance cannot be seen in the same way as other industries (Cadez and Czerny, 2016; Mojarad et al., 2018). The value chain of the oil and gas industry includes such exploration and field development (Desai et al., 2020; Guo et al., 2019) with heavy investment in terms of technology and human capital expertise (Bento et al., 2021; Crivellari et al., 2018; Guo et al., 2019; Monday, 2015; Mu et al., 2020). Nevertheless, the business performance is largely determined by its ability to manage the operations that comprise production, drilling, transportation, and storage (Bento et al., 2021). Given the nature of the oil and gas business, its performance doesn't stop solely at financial measurements but extends to non-financial measurements (Abreu et al., 2021; George et al., 2016; Spelman et al., 2017). Uncontrollable environmental factors have challenged the financial performance and position of players within the oil and gas industry (Hopkins, 2016; Mitchell et al., 2015) and it has been more influential to the upstream petroleum industry (Grasso, 2019; Stoddart et al., 2020).

While sustaining financial position has been a great challenge to the oil and gas industry players (Mitchell et al., 2015), tightening

Appendix U Appreciation from Elsevier Publisher



ELSEVIER

Journal Of Cleaner Production

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Appendix V Appreciation from IPTC (2021)

IPTC
International Petroleum Technology Conference

CERTIFICATE OF APPRECIATION

Presented to

Sriyanta Hadi

in recognition of your participation and contribution as

Presenter
at the
13th International Petroleum Technology Conference
23 March – 1 April 2021
VIRTUAL

M.A. Baqi

Mahmoud M. Abdulbaqi
IPTC Board Chairman

Sponsoring Societies
AAPG
EAGE
SEG
SPE

Appendix W Appreciation from SPE (2017)

Certificate of Appreciation

The Society of Petroleum Engineers (SPE) gratefully acknowledges

SRIYANTA HADI

Technical Presenter

In recognition of participation at the

SPE Workshop: Production Forecasting

4-5 October 2017

Abu Dhabi, United Arab Emirates

Janeen Judah

Janeen Judah
2017 SPE President

SPE International

Mark Rubin
SPE CEO and Executive Vice President

Appendix X Appreciation from SPE (2019)

Shauna Noonan
2020 SPE President

14 November 2019

Re: 2019 Abu Dhabi International Petroleum Exhibition and Conference (ADIPEC)
11–14 November 2019, Abu Dhabi, United Arab Emirates

Dear Author(s),

On behalf of the Conference Programme Committee, I would like to express our sincere appreciation for your contribution to the 2019 Abu Dhabi International Petroleum Exhibition and Conference (ADIPEC), which took place from 11–14 November 2019 in Abu Dhabi, United Arab Emirates.

We hereby acknowledge your presentation at the conference with the paper detailed below:

SPE-197363-MS, Molecule to Molecule (M2M) Water Injection Performance Review to Achieve Water Injection Excellence in PETRONAS - Part 1 Surface Operations
S. Hadi, M.B. Ab Wahab, B.M. Nasron, W.A. Sharkawi, N. Abd Latiff, PETRONAS

We would also like to thank your organisation for supporting your involvement in SPE activities. You are helping to ensure that SPE will continue to enable the global oil and gas E&P industry to share technical knowledge needed to meet the world's energy needs in a safe and environmentally responsible manner.

Sincerely,

Shauna Noonan
2020 SPE President

Appendix Y Journal Reviewer Appreciation from Elsevier

Appendix Z Conference Paper Reviewer Appreciation

JCB 2021

IAFMI

IATMI

CERTIFICATE OF REVIEWING

Joint Convention Bandung HAGI - IAGI - IAFMI - IATMI

"Strategic Alliance Acceleration in Natural Resources Utilization and Hazard Mitigation for National Resilience"

Sriyanta Hadi

Ph.D. Candidate of Universiti Teknologi Malaysia

In Recognition of The Review Contributed to Full Manuscript

Ari Iskandar

Chairman JCB - 2021

Appendix AA Paper Reviewer and Program Committee Appreciation 2021

Society of Petroleum Engineers

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awards

Sriyanta Hadi

in recognition of outstanding support and contribution as the
Workshop Programme Committee

Produced Water Treatment and Management (Onshore and Offshore)
26 – 28 April 2021 • 13:00 hours (UTC +8)

Tom Blasingame
2021 SPE President
Texas A&M University

Mark Rubin
CEO and Executive Vice President

Appendix BB Paper Reviewer and Program Committee Appreciation 2019

Society of Petroleum Engineers

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Society of Petroleum Engineers (SPE)
awards

Sriyanta Hadi

in recognition of outstanding support and contribution as the
Workshop Programme Committee

SPE Workshop:
Water Injection Excellence
25 – 26 March 2019 • Hilton Kuala Lumpur, Malaysia

Sami Alnuaim

Sami Alnuaim
2019 SPE President, Saudi Aramco

Mark Rubin
CEO and Executive Vice President

Appendix CC Journal Reviewer Appreciation from Springer

9th December 2021

Pune, India

To whom it may concern—

I write to confirm that **Sriyanta Hadi** acted as a reviewer for *Humanities & Social Sciences (ISSN: 2662-9992),* published by Springer Nature.

As a reviewer, **Sriyanta Hadi** agreed to the following responsibilities:

- Act as a peer reviewer for submitted papers, subject to availability;
- Provide feedback on an *ad hoc* basis to the Associate Editors on the suitability of submitted papers for publication;
- Act as advocate for the journal throughout your community;
- Provide feedback to the Editorial team on editorial policy or strategy when requested.

Yours faithfully,

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Assistant Editor

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