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INDONESIA'S BANKING EXCELLENCE IN THE EYES OF CROWE'S FRAUD PENTAGON

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Abstract. *Complex factors trigger fraud. The basic theory is the fraud triangle theory. Crowe (2011) developed the idea into a pentagon theory and found two other factors: arrogance and competence. This study aims to analyze each element of Crowe's Fraud pentagon theory to detect fraudulent financial statements. Various proxies were used: pressure (financial targets and stability; external pressure; institutional ownership), opportunity (number of audit committees and nature of the industry), rationalization (change in auditors and auditor opinion), competence (change in directors and ineffective monitoring), arrogance (picture of the number of CEOs). Seventy-six banking companies listed on the IDX from 2013 to 2017 became sample. A multiple regression model is used as technique analysis. The results showed that pressure, rationalization, and competence affected financial statement fraud (FSF). This influence is in a good tone. This research contributes to the development of the Crowe's Fraud pentagon and Indonesian banking governance..*

Keywords: *Fraud Triangle, Fraud Pentagon, Financial Statement Fraud.*

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Introduction

Public companies periodically report management activities in their financial statements (Kaawaase et al., 2021). The purpose is to communicate to internal and external parties (Jaswadi et al., 2022). Internal parties use financial statements to make decisions (IFRS, 2020). Meanwhile, external parties use it to get information about the company's condition over a certain period (Xu et al., 2020).

Financial statement information should beneficially present reasonably and fraud-free to internal and external parties (Kaawaase et al., 2021). Practically, not all companies present financial statements that are fraud-free (Jaswadi et al., 2022). ACFE (2022) reported that 9% of financial statement fraud (FSF) schemes were out of 2110 fraud cases worldwide, with a median loss of $593,000. Based on the median loss, companies should implement fraud detection and prevention to minimize fraud (Saluja et al., 2021).

A complex of factors triggers fraud. The fraud triangle was the first theory that addressed this factor (Cressey, 1953). Those factors are pressure, opportunity, and rationalization. Wolfe & Hermanson (2004) developed a previous theory and found that capability was also a trigger factor

for fraud. Hence, it is known as the fraud diamond theory. Furthermore, Crowe (2011) developed the fraud triangle into the pentagon theory and revealed two other factors: arrogance and competence.

Arrogance is a superior attitude toward the ability to feel they are the best, and internal control does not affect them (Sarikhani & Ebrahimi, 2021). Meanwhile, competence is employees' skill in ignoring internal control, developing concealment strategies, and observing social conditions for personal purposes (Crowe, 2011; Devi et al., 2021). These two factors proved that FSF occurs due to the motives of the internal perpetrators (Vousinas, 2019). Responding to the development of the factors that cause fraud, we use Crowe's Fraud pentagon theory as a framework for analyzing its influence on FSF.

This study provides empirical evidence that Crowe's pentagon theory affects FSF. The Financial Services Authority carries out strict supervision of the Indonesian banking sector. However, the ACFE (2022) (Indonesia chapter) shows that banking is one of the sectors with the highest percentage of fraud. Therefore, this sector is interesting to conduct a study. FSF is measured by the modified Jones model's value of discretionary accruals (Dechow et al., 1995). In contrast to Antawirya et al. (2019) and (Avortri & Agbanyo, 2020), we use more proxies for fraud pentagon theory:

- pressure (financial targets and stability, external pressure, and institutional ownership)
- opportunity (the number of the audit committee and the nature industry)
- rationalization (the change of auditor and auditor's opinion)
- competence (the change of directors and ineffective monitoring)
- arrogance (the number of CEOs' pictures).

The research findings that influence the FSF in Indonesian banking are pressure (financial target), rationalization (auditor's opinion), and competence (the change of director). Surprisingly, these findings make Indonesian banks look excellent. The existence of pressure and rational reasons for earnings management motivates directors to optimally maximize the interests of shareholders and ultimately minimize FSF. This effect will be practical if the authority of banking directors is restricted as fraud prevention.

Our research contributes in two ways. First is a review of Crowe (2011). The findings show that three factors in Crowe (2011) affect FSF. It proves that Crowe (2011) fraud pentagon theory can detect FSF. These findings are the basis for developing models to enhance understanding fraud's causes. Second, improving banking governance. Indonesian banking management minimizes the opportunity for FSF by establishing fraud detection and prevention for the five factors in Crowe's fraud pentagon theory.

The following section discusses the theoretical basis and hypotheses. The third section discusses data sources, measurement of variables, and data analysis techniques used. The test results and discussion are stated in section four. The last section includes conclusions, limitations, and suggestions for the development of further research.

Literature Review

Theoretical Background

ACFE (2022) defines fraud as an act of wrongdoing by individuals or groups who know that such behavior harms individuals and other parties. Perpetrators commit fraud for a reason (Cheliatsidou et al., 2021). Cressey (1953) showed that the three causes: pressure, opportunity, and rationalization. Pressure defines motive that drives a person to commit fraud (Vousinas, 2019). SAS No. 99 indicates several conditions that pressure individuals: financial stability, pressure from outside and financial targets. Opportunity exists because inadequate supervision allows perpetrators to commit fraud (Latan et al., 2021). Meanwhile, rationalization refers to the feeling of justification that the action is not criminal because it is a common act (Kassem, 2021).

Crowe (2011) shows that other factors trigger fraud: arrogance and competence. Arrogance is a superior attitude toward the ability to feel they are the best, and internal control does not affect them (Sarikhani & Ebrahimi, 2021). Competence is the skill of ignoring internal control, developing

concealment strategies, and observing social conditions for personal purposes (Crowe, 2011; Devi et al., 2021).

Financial statement fraud (FSF) is a misstatement made intentionally by management to deceive financial statements stakeholders (Khamainy et al., 2022; Owusu et al., 2022). Several reasons management does this, according to Baskaran et al. (2020):

1. improve performance and cover weaknesses to generate profits,
2. benefits from the increased performance to eliminate negative perceptions
3. lower taxes.

Hypothesis Development

Crowe (2011), the first factor that causes fraud is pressure. One of the problems management faces is financial targets in the form of business returns (Omukaga, 2021). Return on Assets (ROA) is the ratio used to show the rate of return (Khamainy et al., 2022). Higher ROA indicates a higher probability of committing FSF. It is triggered by pressure to show high financial performance (Saluja et al., 2021). Rashid et al. (2022), the pressure to commit fraud is higher when management is required to attract investors to invest in their company. Khamainy et al. (2022) indicate that management also pressures institutional ownership. A large amount of institutional ownership forced management to do more activities to avoid losing investors (institutions) who dared to make up financial statements. Therefore, the first hypothesis is:

H1. Pressure affects financial statement fraud.

The second factor, according to Crowe (2011), is opportunity. The audit committee supervises the company's financial statements, external audits, and internal control (Jaswadi et al., 2022). A supervisory mechanism improves reporting integrity and minimizes the possibility of FSF (Nasir et al., 2019). On the other hand, the nature of the industry, indicated by the company's conditions, provides an opportunity for committing fraud (Khamainy et al., 2022). Good companies reduce the receivable amount by increasing their income from cash. Therefore, receivables on sales provide an opportunity for management to commit fraud by making the receivables amount low (Khamainy et al., 2022). The following hypothesis is proposed:

H2. Opportunity affects financial statement fraud.

Rationalization is the third factor in Crowe (2011). Skousen et al. (2009) show that changes in auditor opinion and auditor rotation are proxies for rationalization. Companies often change their auditors to avoid fraud detected by previous auditors (Khamainy et al., 2022; Skousen et al., 2009). Demetriades & Owusu-Agyei (2022) indicate that management feels rational about the modified unqualified opinion provided by the auditor. They feel that a modified unqualified opinion is the auditor's tolerance for the earnings management they are doing, and this is not a mistake or a crime (Baskaran et al., 2020). The third hypotheses are:

H3. Rationalization affects financial statement fraud.

Competence is the new factor proposed by Crowe (2011). The executive directors' position in companies triggers fraud by utilizing their authority to influence others and smooth out their act (Avortri & Agbanyo, 2020; Skousen et al., 2009; Zahari et al., 2022). Hence, Khamainy et al. (2022) state that the changes in the board of director (Olaniyi et al.) indicate FSF. In addition, they also proved that the ineffectiveness of supervision by the independent board of commissioners (BOC) was triggering fraud. Ineffective monitoring of the independent BOC in supervision makes it easy for perpetrators to commit FSF. The fourth hypothesis proposed is:

H4. Competence affects financial statement fraud.

Crowe (2011) argues that arrogance is a trigger for perpetrators to cheat. Sarikhani & Ebrahimi (2021) used the number of CEOs' pictures as a proxy to measure arrogance. Arrogant CEOs want to show the public their existence, so they put a lot of photos of them in the annual report. His arrogance makes the CEO feel superior by being able to do anything, including committing fraud. Based on that, the last hypothesis is:

H5. Arrogance affects financial statement fraud.

Methods

The data is sourced from the annual reports of banking companies accessed through www.idx.co.id and the banking official websites. The research sample is banking companies listed on the Indonesia Stock Exchange from 2013 to 2017. The population was 225 observations. Companies that do not publish research data are removed from the sample, resulting in 76 observations. Numerous companies that do not publish their annual reports either on the IDX website or their official website during the observation cause a high number of samples excluded from the initial population. The measurement of research variables is presented in Table 1. Multiple linear regression is used as a research analysis technique with the following model:

$$\begin{aligned} DACC_{it} &= \beta_0+\beta_1 ROA_{it}+\beta_2 ACHANGE_{it}+\beta_3 DER_{it}+\beta_4 OSHIP_{it}+\beta_5 AUCSIZE_{it}+ \\ &+\beta_6 RECEIVABLE_{it}+\beta_7 AUCHANGE_{it}+\beta_8 AOPINION_{it}+\beta_9 DCHANGE_{it}+\beta_{10} BDOUT_{it}+\beta_{11} PIC_{it}+e \end{aligned} \quad (1)$$

Table 1
Variable Measurements

Variable	Measurement	Formula	Source
Independent:			
Pressure	Financial Target	$ROA=\frac{Net\ Income}{Total\ Assets}$	Skousen et al. (2009)
	Financial Stability	$ACHANGE=\frac{Total\ Asset(t)+Total\ Asset(t-1)}{Total\ Asset(t-1)}$	
	External Pressure	$DER=\frac{Total\ Debt}{Total\ Equity}$	
	Institutional Ownership	$OSHIP=\frac{institutional\text{-}owned\ shares}{number\ of\ outstanding\ shares}$	
Opportunity	The Number of Audit Committee Members	$AUCSIZE=number\ of\ audit\ committee$	Akbar (2017)
	Nature of Industry	$RECEIVABLE=\frac{Receivable_t}{Sales_t}-\frac{Receivable_{t-1}}{Sales_{t-1}}$	Skousen et al. (2009)
Rationalization	Change of Auditor	AUCHANGE = Dummy, one, if there is a change of auditor during the observation period. 0 otherwise.	
	Auditor's Opinion	AOPINION = Dummy, one, if it has an unqualified opinion during the observation period. 0 otherwise.	
Competence	Change of Director	DCHANGE = Dummy, one, if there is a change of directors during the observation period. 0 otherwise.	Demetriades & Owusu-Agyei (2022)
	Ineffective Monitoring	$BDOUT=\frac{\text{The Number of independent commisioner}}{The\ total\ of\ number\ commisioner}$	Skousen et al. (2009)
Arrogance	The Number of CEOs Picture	PIC = the number of CEO images in the annual report	Antawirya et al. (2019)
Dependent:			
Financial Statement Fraud (FSF)	Discretionary Accrual (earnings management)	$\lvert DACC_{it}=TACC_{it}-NDACC_{it}\rvert$	Dechow et al. (1995)

Results

Table 2 shows the mean of ROA = 0.0121079; ACHANGE = 0.1225461; DER = 6.6280961; OSHIP = 0.7316355; AUCSIZE = 3.8026; RECEIVABLE = -0.0497539; AUCHANGE = 0.54; AOPINION = 0.62; DCHANGE = 0.57; BDOUT = 0.5911041; PIC = 2.14. A multicollinearity test was conducted to find out whether there was a multicollinearity problem (Alzeban, 2019). The VIF value of all variables < 10 means that there is no multicollinearity problem (Table 3).

Hypothesis Testing and Discussion

In Table 4, ROA is significant at 1% level with a negative coefficient. It concludes that financial targets have a negative effect on FSF. AUOPINION is significant at the 5% level with a positive coefficient. It means Auditors' opinion has a positive effect on FSF. Finally, with a positive coefficient, DCHANGE is significant at the 5% level. It means the director's change has a positive effect on FSF.

In contrast, other variables are not significant. It means that, apart from the previous three variables, all variables do not affect FSF. The adjusted R square value indicates that the independent variable explains the dependent variable by 35%, and factors outside the study explain the remaining 65%.

Table 2
Descriptive Statistics

	N	Min	Max	Mean	Std. Deviation
ROA	76	0,00	0,03	0,01	0,01
ACHANGE	76	-0,07	0,31	0,12	0,09
DER	76	3,44	11,50	6,63	2,19
OSHIP	76	0,26	1,10	0,73	0,18
AUCSIZE	76	3,00	6,00	3,80	0,88
RECEIVABLE	76	-2,82	3,62	-,005	1,14
AUCHANGE	76	0,00	1,00	0,54	0,50
AUOPINION	76	0,00	1,00	0,62	0,49
DCHANGE	76	0,00	1,00	0,57	0,50
BDOUT	76	0,40	0,75	0,59	0,08
PIC	76	0,00	4,00	2,14	0,86
DACC	76	-148,12	0,08	-5,51	26,02
Valid N (listwise)	76				

**Source: Processed Data, 2022*

Table 3
Multicollinearity Test Results

Model	Collinearity Statistics	
	Tolerance	VIF
ROA	0,71	1,40
ACHANGE	0,51	1,95
DER	0,57	1,76
OSHIP	0,67	1,50
AUCSIZE	0,55	1,82
RECEIVABLE	0,76	1,31
AUCHANGE	0,57	1,74
AUOPINION	0,61	1,64
DCHANGE	0,48	2,07
BDOUT	0,69	1,44
PIC	0,70	1,42

**Source: Processed Data, 2022*

Effect of Pressure on financial statement fraud

The test results prove that financial targets have a negative effect on FSF. Meanwhile, financial stability, external pressure and ineffective monitoring have no effect (Table 4). Therefore, because there is one influential variable, H1 is accepted.

In contrast, Akbar (2017) and Antawirya et al. (2019) stated that the higher ROA provokes investors to invest in the company and encourages management to commit FSF. However, the research findings prove that Indonesian banking truly works excellent. Evidently, the higher the ROA, the lower the FSF (Table 4).

Table 4
Multiple Linear Regression Test Results

	B	T	Sig.
const	52,35	1,38	0,17
ROA	-1676,46	-4,22	0,00*
ACHANGE	-46,44	-1,26	0,21
DER	0,302	0,20	0,84
OSHIP	17,81	1,09	0,28
AUCSIZE	-1,96	-0,52	0,60
RECEIVABLE	-3,64	-1,48	0,14
AUCHANGE	-8,99	-1,40	0,16
AUOPINION	16,03	2,51	0,01**
DCHANGE	15,22	2,17	0,03**
BDOUT	-69,84	-1,88	0,06
PIC	-5,09	-1,50	0,14
Adjusted R Sq	0,35		

*Signs *, ** are significant at the 1% and 5% levels.*
Source: Processed Data, 2022

In investors' perception, the higher ROA indicates that the management of banking companies can work well to generate profits (Khamainy et al., 2022). In line with that perception, Indonesian banking management is competing to maximize their ROA with an excellent way to attract investors (Rashid et al., 2022; Saluja et al., 2021). Therefore, the financial target is a good pressure that motivates Indonesian banking management to keep their distance from FSF.

The excellent effect of pressure is strengthened by the results of ACHANGE, DER and OSHIP (Table 4). Indonesian banking management does not simply carry out earnings management to improve performance while financial conditions are unstable. They are aware that customer and shareholder trust is paramount. Therefore, fluctuations in customer deposits (leverage) or institutional ownership do not affect how they work. In addition, the bank's directors enforce good governance to maintain the firm value, so they do not waver in committing fraud. This result extends to Crowe (2011) that pressure affects FSF, but in Indonesian banking, this has a good tone.

Effect of Opportunity on financial statement fraud

The regression test shows that AUCSIZE and RECEIVABLE do not affect FSF. In conclusion, H2 is rejected. Antawirya et al. (2019) show the negative effect of the number of audit committees on FSF. In contrast, the research findings prove that each Indonesian banking audit committee is independent, and the number has no effect. The Indonesian banking audit committee upholds the independence of its profession. Therefore, regardless of the number of members, it does not create opportunities for fraud. Furthermore, each audit committee member works independently to ensure that the financial statements are fairly presented (Akbar, 2017).

The nature of the industry, as proxied by the ratio of receivables to sales, does not affect fraudulent financial statements because Indonesian banking management is strict on good corporate governance. Indonesian banking management has proven to have good character because it prioritizes the flow of cash receipts (Akbar, 2017). It is proven by the low mean ratio of receivables to sales (Table 2). The Indonesian banking directors work excellently, so the ratio of receivables to sales is low. They do not have the ambition to take advantage of opportunities by manipulating the ratio to look dashing. Research findings expand on Crowe (2011) that opportunity is not constantly triggering FSF. Indonesian banking directors uphold independence and good character, so they are not interested in committing fraud even though there is an opportunity.

Effect of Rationalization on financial statement fraud

Rationalization proxied by AUCHANGE does not affect FSF. Meanwhile, AOPINION shows the opposite. Because one of the two measurements has an effect, H3 is accepted. Rationalization affects FSF.

The change of auditors does not mean banks are trying to eliminate traces of FSF (Akbar, 2017). Government Regulation No.20 of 2015 states that public accountants have a maximum limit of five consecutive years to audit one client. Therefore, the change of auditors does not affect the FSF because the bank in Indonesia complies with these rules.

Auditor opinion has a positive effect because Indonesian banking management is aware of the importance of getting an unqualified or modified unqualified opinion for going concerned (Bayo Flees & Mouselli, 2022; Sandhu, 2022). Therefore, banking directors try to achieve this opinion by conducting earnings management (Baskaran et al., 2020).

Baskaran et al. (2020) stated that earnings management is not necessarily bad. Banking directors strive to fulfil their obligations to shareholders by maximizing firm value through income smoothing to show sustainable growth and tax interests (Purwanti et al., 2015). This action is known as informative earnings management because it increases investor confidence through stable earnings (Sun & Al Farooque, 2018). This practice is typical in the business world (Kassem, 2021). Therefore, at the end of the audit, the auditor will continue to provide an unqualified or modified unqualified opinion if they have sufficient assurance about the financial information reported by management. Referring to Crowe (2011) perspective, it must be realized that this rationalization can trigger FSF if there is poor communication between the auditor and management.

Effect of Competence on financial statement fraud

DCHANGE has a positive effect on FSF. Meanwhile, BDOUT has no effect. In conclusion, H4 is accepted. In line with Puspitha & Yasa (2018) and Avortri & Agbanyo (2020), individuals with high positions have competence, so they easily commit fraud and have a significant impact. These results support Crowe (2011) that the competence of banking directors is a resource for him. However, they can easily commit FSF without being detected if there is an opportunity. Therefore, Indonesian banking management must limit the authority of its board of directors to prevent fraud (Antawirya et al., 2019).

Financial Services Authority Regulation No. 55/POJK.03/2016 requires 50% of the board of commissioners to be independent members. Table 2 shows that, in general, Indonesian banking companies have complied with these regulations. The research means that above 50% proves that the supervision of independent commissioners is very dominant and influential (Akbar, 2017). However, the existence of financial services authority regulations biases the influence of independent commissioners' competence on FSF because all banks are closely monitored. Therefore, ineffective monitoring does not affect FSF.

Effect of Arrogance on financial statement fraud

The number of CEOs' pictures does not affect FSF. H5 is rejected. The number of pictures in the annual report indicates the CEO's arrogance, but this arrogance does not necessarily affect his desire to commit FSF (Akbar, 2017).

The findings broaden Crowe (2011) perspective that the arrogance of Indonesian banking CEOs does not encourage them to commit FSF. The number of their images in the annual report is intended to make them known to the public (Murthy & Gopalkrishnan, 2022). The more popular CEOs perform high because they must make decisions carefully to maintain their reputation (Wardhani & Supratiwi, 2021).

Conclusion

Crowe (2011) mentions the factors that trigger the occurrence of FSF: pressure, opportunity, rationalization, competence, and arrogance. The purpose is provide empirical evidence that the five factors of Crowe (2011) affect FSF. The research findings prove that pressure, rationalization, and competence affect FSF. Uniquely, these findings make Indonesian banking seem excellent. The existence of pressure and rational reasons for earnings management makes banking directors

optimally motivated to maximize the interests of shareholders and ultimately minimize the potential for FSF. However, this significant effect is practical if the authority of the banking directors is limited to prevent fraud.

Referring to Crowe (2011) perspective, the research has implications for two conditions. First, Indonesian banking management must maintain good corporate governance and improve its quality to minimize FSF. Second, the supervision of the Government through the relevant authorities on Indonesian banking must be maintained so there is no room for FSF. The number of companies that do not publish their annual reports either on the IDX website or their official website during the observation period is a limitation of the study. Future research is expected to have adequate access to published banking annual reports and more observations so results can be generalized properly. Finding other arrogance measurement proxies can be carried out by subsequent research to complement these findings to be comprehensive.

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INVESTING IN THE ISLAMIC WORLD: OPPORTUNITIES, CHALLENGES, AND IMPLICATIONS

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Abstract. *Islamic finance, which is based on the principles of Shariah law, offers a unique and growing investment opportunity for investors seeking ethical and diversified portfolios. This sector has witnessed substantial growth in recent years, reaching a market capitalization of $2 trillion in 2019. The appeal of Islamic finance lies in its emphasis on ethical principles, such as prohibition of interest (riba) and excessive uncertainty (gharar), which aligns with the values of many investors.*

In addition to its ethical underpinnings, Islamic finance also offers a number of economic advantages. Islamic banks have demonstrated resilience during financial crises, such as the 2008 financial downturn. This is attributed to their risk-sharing approach and focus on asset-backed financing. Islamic finance also has the potential to promote financial inclusion by providing products that meet the needs of underserved populations.

However, there are also challenges associated with investing in the Islamic world. One challenge is the lack of a unified regulatory framework for Islamic finance. This can make it difficult for investors to navigate the regulatory landscape and ensure that their investments are compliant with Shariah principles. Additionally, the diversity of the Islamic world, with its varying socioeconomic dynamics and interpretations of Shariah principles, can make it difficult to develop a one-size-fits-all investment strategy.

Despite these challenges, Islamic finance offers a compelling investment opportunity for investors seeking ethical, diversified, and potentially more stable returns. As the sector continues to grow and mature, it is likely to attract even more investment from a wider range of investors.

Keywords: *Islamic finance, Shariah law, ethical investing, risk-sharing, financial inclusion, global economic stability.*

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Introduction

Sharia law, which is an amalgamation of teachings from the Quran and the Hadith (which are sayings of Prophet Muhammad), is the foundation upon which Islamic banking is built. Riba, which translates to "interest," gharar, which means "excessive uncertainty," and investments in haram, or banned, industries like gambling, alcohol, and pork are all prohibited by core principles. This has resulted in the development of unique instruments, the most notable of which are'sukuk' (which are comparable to bonds) and'mudarabah' (which are profit-sharing partnerships), which differentiate Islamic finance from its conventional equivalents (El-Gamal, 2006).

Literature Review

A Rapidly Expanding Financial Frontier

(Refinitiv, 2019) By the year 2019, the Islamic financial sector had an astounding total market capitalization of $2 trillion worldwide. It is a philosophy that has been adopted by countries

all over the world, including the Middle East, Southeast Asia, portions of Europe, and Africa. Pioneering nations such as Malaysia and the United Arab Emirates have effectively positioned themselves as epicenters of financial innovation and services that are consistent with Shariah law.

Resilience and Ethical Allure

The endurance of Islamic finance in the aftermath of the financial crisis of 2008 is a key milestone that underscores the strength of Islamic finance. Islamic banks have shown extraordinary stability in compared to their conventional counterparts (Cihak & Hesse, 2010). This may be attributed to their reluctance to taking excessive risks and their concentration on financing that is supported by actual assets. This, in conjunction with the industry's constant development trajectories, highlights the potential of the sector as a magnet for investment.

The attractiveness of the Islamic financial landscape is multidimensional, and it is closely connected with the religious principles, ethical qualities, and promising economic dynamics of the Islamic economy. Islamic finance, which has its foundations in the time-honored concepts of Shariah law, provides a novel alternative to the traditional financial systems that are now in place. As a result, investors from all over the world are drawn to its innovative but conservative approach.

The Contribution of Religious Foundations to the Acceleration of Financial Growth

The Shariah law, which is a divine legal framework drawn from the Quran and the Hadith, lies at the core of the Islamic financial system. This is the foundation upon which every aspect of Muslim life is built, including the conduct of financial transactions. It is impossible to overestimate the significance of having a monetary system that is consistent with the tenets of many religions in a world where billions of people are guided by their beliefs. Observant Muslims who are wanting to adhere to their religion naturally gravitate towards financial products that are consistent with Shariah, which results in the creation of a large, devoted consumer and investment base. According to Iqbal and Mirakhor (2011), this connection with religion makes it more than just a choice for many people; rather, it makes it a religious obligation.

Appeal to Ethical Standards: Going Beyond Religious Obligations

The moral underpinnings of Islamic banking have widespread applicability, even outside the core demographic of Muslims who use it. Because of its bans on riba (interest) and gharar (excessive uncertainty), it ensures that transactions are open, egalitarian, and free of aspects that might be exploitative. In addition, the prohibition of activities like as gambling, alcohol use, and pork consumption exemplifies the organization's dedication to the promotion of endeavors that have a beneficial effect on society as a whole. This emphasis on ethics chimes with a growing worldwide emphasis on responsible and sustainable investment, which connects with the topic at hand. According to El-Gamal (2006), many investors find that the ethical grounding of Islamic finance is congruent with their own beliefs and goals of having a long-lasting, constructive effect on society.

Considerations Regarding the Economy: Both Stability and Growth

When seen from an economic perspective, the Islamic financial system provides a stronghold of stability while yet exhibiting vigorous expansion. Historically, Islamic banks have shown resilience during financial downturns, most notably the financial crisis that occurred in 2008 (Cihak & Hesse, 2010). This is partly due to their risk-averse approach and the fact that their transactions are backed by actual assets. Additionally, the industry has shown sustained growth trajectories, exceeding many traditional sectors. Countries like as Malaysia and the United Arab Emirates are examples of the economic vibrancy of the industry because of the innovative Shariah-compliant products and effective regulatory frameworks that they have in place.

The Meeting Point of Religious Values, Business Ethics, and Public Policy

Investing in the Islamic world is attractive because it offers a compelling combination of faith-based requirements, ethical imperatives, and exciting economic potentials. It presents an opportunity for astute investors to take part in a financial paradigm that is not only economically viable but also ethically gratifying, and it does so in a way that is commensurate with their level of expertise.

Getting acquainted with the Landscape: challenges and Opportunities

The field of Islamic finance has a tremendous amount of promise, but it is not without its share of difficulties. It's possible that international investors who are used to and familiar with conventional finance would struggle to understand this novel paradigm. The challenges vary from maintaining regulatory compliance across a variety of nations to comprehending the complexity of Shariah law in relation to financial matters. As we get deeper into this discussion, one of our goals is to demystify the terrain by drawing attention to its potentially profitable opportunities as well as its inherent difficulties.

In the middle of a mostly conventional financial environment, what opportunities and obstacles await investors willing to explore the broad terrains of Islamic finance? And the overall question that will guide our discussion as we begin our investigation.

The Moral and Financial Arguments in Favor

Islamic finance, which has its origins in the Quran and the Hadith, forbids riba, also known as interest, and gharar, also known as excessive ambiguity. This ensures that financial transactions are fair and free from exploitation (Usmani, 2002). This system also demands abstinence from investments in industries deemed haram (forbidden), such as alcohol, gambling, and pork, which helps to strengthen its ethical base (Kahf, 2004). Specifically, this system prohibits investing in the alcohol, gambling, and pork industries. These ethical criteria have a strong resonance with the larger global movement toward responsible and sustainable investment, and they have the ability to appeal to a wide audience that extends beyond those who adhere to the Islamic religion (Ahmed, 2011). The Shariah-compliant model is emerging as a beacon of ethical and sustainable investment (Chong & Liu, 2009). This is due to the fact that traditional financial systems are now struggling with ethical challenges.

Concurrently, the economic potential of Islamic-majority nations, which are wealthy in resources and have populations that are expanding quickly, provides profitable investment options. According to Wilson (2014), nations that are members of the Organization of Islamic Cooperation (OIC) are seeing explosive development in a variety of economic spheres, including infrastructure, technology, halal food, and Islamic tourism.

Nevertheless, there are certain to be obstacles when trying to reconcile age-old religious precepts with the complexities of contemporary finance. There are obstacles in the form of regulatory differences across nations, arguments among religious academics over the compliance of financial goods, and the larger difficulty of reconciling religious beliefs with current financial requirements (Warde, 2000). To comprehend and successfully navigate these issues is very necessary for investors because of the possible advantages, which include a stake in a financially sector that is morally anchored and quickly developing.

Results

The operational and ethical principles underlying Islamic finance and conventional finance are essentially distinct from one another. The principles of Islamic finance, which are derived directly from Shariah law, are at the core of these discrepancies (Khan & Bhatti, 2008). These rules regulate the financial operations of a sizeable section of the world's population and are the basis for Islamic money.

Differentiating Islamic Financial Principles from Conventional Finance

The outlawing of usury in the form of interest

The concept of riba, which is sometimes rendered into English as "interest," is absolutely forbidden in Islamic banking. This ban stems from the concept that money should not, by itself, create additional money when borrowed or deposited unless there is a legitimate effort or risk involved (Chapra, 1985). This view led to the establishment of this prohibition. Lending money at an interest rate is the cornerstone of traditional finance. Banks make loans at a set interest rate, and their profits come from the spread between the income they collect on loans and the interest they pay on deposits.

On the other hand, the foundation of Islamic finance is the notion of spreading out one's exposure to risk. Contracts such as musharakah, which means "partnership," and mudarabah, which means "profit-sharing," are used in the process of organizing the finance. For instance, one side of a Mudarabah contract is responsible for providing the financial resources, while the other side is in charge of providing the expertise. According to Iqbal and Molyneux (2005), the profits (or losses) are consequently divided according to a ratio that was previously agreed upon.

Staying away from Gharar, also known as Excessive Uncertainty

When referring to the terms of a contract or the subject matter, the word "gharar" denotes a state of severe uncertainty and ambiguity. According to El-Gamal (2001), Islamic finance does not permit transactions that are founded on an excessive amount of ambiguity. Selling products that one does not own, such as fish that have not yet been caught, is an example of something that is not allowed to be done.

Conventional finance, on the other hand, often makes use of financial instruments such as derivatives, futures, and options, which are legally binding agreements that may sometimes include aspects of excessive ambiguity and speculation. While it is true that these instruments may be employed for acceptable hedging in conventional settings, the fact that they are speculative in character and are not founded in real assets or physical products causes them to be in contradiction with the principles of gharar in Islamic banking (Zamir, 2013).

Financing based on the security of assets

Every single financial transaction is required to be supported by a physical asset or service according to the fundamental principle of Islamic finance. This is in contrast to the more abstract form of many traditional financial instruments, which might be multiple times away from real assets (Siddiqi, 2006). In addition, many conventional financial instruments are based on derivatives. This guarantees that Islamic finance continues to have a strong connection to the actual economy, which should, in theory, lower the likelihood of financial bubbles or crises resulting from excessive speculation.

The principles that guide Islamic banking set it apart from its Western equivalent in a number of significant ways, the most notable of which are the outlawing of riba and the avoiding of gharar. These values, which have their roots in religious and ethical traditions that date back hundreds of years, are what gave origin to a financial system that is one of a kind. The future of international finance will surely be influenced by the interactions that this system has with the wider global financial environment as it expands in size and increases its level of complexity.

Highlighting Diverse Financial Instruments and Services in the Islamic Market

The breadth of financial products and services that may be adapted to the needs of the Islamic finance market exemplifies the resilience and allure of this kind of economics. These devices, although being in accordance with Shariah law, often fulfill functions that are comparable to their conventional counterparts but are governed by a different set of rules.

Sukuk, also known as Islamic Bonds

Sukuk indicate an undivided beneficial ownership in the underlying asset, in contrast to traditional bonds, which are based on the issuing of debt and the payment of interest (Wilson, 2008). The rewards that are provided to those who hold Sukuk are not in the form of fixed interest payments; rather, they represent a participation in the real productivity and profitability of the asset that the Sukuk is backed by.

Ijarah sukuk is a common kind of structure. In this type of sukuk, the underlying asset is leased out, and the holders of the sukuk earn profits from the payments on the lease. Sukuk, which are backed by assets, provide an additional layer of protection to investors and bring the actual economy and financial markets into closer alignment (Jobst, 2007).

Takaful, sometimes referred to as Islamic Insurance

The word takaful originates from an Arabic term that may be translated as "solidarity" or "mutual guarantee." Takaful is an alternative to traditional insurance, which is based on the notion of risk transfer (Saiti & Noordin, 2014). Instead, Takaful is based on the concept of risk-sharing

among members. Participants make contributions to a mutual fund, and if the fund suffers a loss, it will reimburse the participants who were harmed by the loss.

Mudarabah, which means "sharing profits," and Wakalah, which means "agency," are the two primary models that are used in takaful. The Takaful operator operates as a manager and participates in both the profits and the losses under the Mudarabah style of operation. According to Archer, Rifaat, and Volker (2009), the Wakalah model provides for the operator to receive a charge for the provision of services, while the remainder of the contributions are deposited into the Takaful fund.

Murabahah, sometimes referred to as Cost-Plus Financing

One of the most widespread forms of funding used by Islamic financial institutions is known as murabahah. It entails selling items at a price that already contains an agreed-upon profit margin for both parties involved in the transaction. According to Ahmed (2011), instead of lending money and collecting interest from it, the bank would acquire an item and then sell it to the consumer on a delayed basis.

Ijarah, also known as Leasing

Ijarah, which is analogous to leasing in traditional finance, gives a client the opportunity to make use of an asset in return for regular payments of rental fees. According to Hassan and Lewis (2007), the client may be given the opportunity to acquire the asset at the conclusion of the lease period.

These instruments and services, which are founded on ethical and religious concerns, not only provide viable alternatives to traditional financial products, but also bring novel risk-sharing features. This is because of the ethical and religious foundations upon which they are built. They are demonstrating the versatility and promise of Islamic banking as they continue to gain popularity, meeting a variety of financial demands while adhering to ethical norms.

Evaluating the Effects of Islamic Finance on Economic Growth, Financial Inclusion, and Stability

The rate of economic expansion

Positive effects

Islamic finance has the potential to support economic development by increasing the amount of savings that are mobilized and investing those funds in productive endeavors. It encourages financial institutions to properly examine the possible risks and rewards of their investments, which in turn promotes the making of prudent investment choices (Iqbal & Mirakhor, 2007). This is because of the risk-sharing structure of the system. This provides a more consistent allocation of resources, which in turn drives economic development that is more sustainable.

Constraints On the other hand, some detractors of Islamic banking contend that the system's strong ethical requirements might restrict the availability of funding for particular businesses or endeavors that could be seen as failing to comply with Islamic law. According to Khan and Bhatti (2008), this might lead to a reduction in the variety of possible investments in the economy.

Participation in the Financial System: Positive Impact: Islamic finance helps to increase financial inclusion by providing products that meet the needs of underserved portions of the population, such as religiously motivated individuals who do not use traditional banking institutions. According to Demirguc-Kunt, Klapper, and Randall (2013), Islamic banks are able to increase financial inclusion by targeting previously unbanked segments of the population by offering Shariah-compliant goods to their customers.

Constraints: On the negative side, the lack of knowledge or misunderstandings about Islamic finance in some locations may impede the full potential of financial inclusion. This is the case because of the lack of awareness of Islamic financing. In addition, as compared to traditional banks, the restricted selection of goods offered by online banks may not be able to meet the varied requirements of all customers.

Stability of the Financial System:

Positive Aspects

Conventional banks tend to have higher risk profiles than their Islamic counterparts do since Islamic banks are forbidden from engaging in speculative activities and place a greater focus on asset-backed transactions. In addition, the application of the concept of risk-sharing in transactions entails the better distribution of risks, which makes the system less susceptible to the effects of systemic shocks. This was made abundantly clear during the financial crisis that occurred between 2007 and 2008, when Islamic banks, in general, demonstrated superior resilience (Beck, Demirguc-Kunt, & Merrouche, 2013).

Limitations

On the other hand, the absence of a well-established Islamic interbank money market and liquidity management tools might provide difficulties for Islamic financial institutions in terms of the danger of running out of liquid assets. In addition, the lack of a worldwide regulatory framework that is standardized for Islamic banking presents issues in terms of assuring consistency and stability across a variety of areas (Chapra & Ahmed, 2002).

While Islamic banking has a number of advantages, including the promotion of ethical investment, the guarantee of risk distribution, and the improvement of financial inclusiveness, this kind of financing is not devoid of difficulties. To guarantee that Islamic finance can reach its full potential in promoting economic development, financial inclusion, and stability in the Islamic world, it needs coordinated efforts by regulators, academics, and practitioners to address its constraints. This will ensure that Islamic finance can realize its full potential.

Discussion

The worldwide investment landscape has developed to accept the significant role of Islamic finance, and its attractiveness is not just restricted to the Muslim population but spans investors who perceive it as an ethical and diverse investment channel (El-Gamal, 2006). The global investment landscape has evolved to embrace the prominent function of Islamic finance. Investing in the Islamic world presents global investors and financial institutions with a one-of-a-kind opportunity as well as a set of obstacles that demand an in-depth grasp of the Shariah principles that govern Islamic finance.

Investing in the Islamic sector is appealing for a number of reasons, one of which is the ethical component that it symbolizes. Islamic finance converges with the larger ethical investment movement and, as a result, aligns with the ideals of a rising group of global investors who prioritize ethical concerns (Hassan & Lewis, 2007). Islamic finance converges with the larger ethical investing movement by avoiding businesses associated to alcohol, gambling, and speculative finance, amongst other things. The resilience displayed by Islamic financial institutions during the global financial crisis of 2007-2008 is evidence that the risk-sharing aspect of Islamic banking contributes to increased financial stability (Beck, Demirguc-Kunt, & Merrouche, 2013). In addition, as it is based on asset-backed financing, it controls the expansion of credit to an excessive degree and strives to link financial transactions to actual economic activity.

Nevertheless, it is necessary to have a sophisticated approach in order to tap into the potential of the Islamic market. It is essential, to begin, to have an awareness of and an appreciation for the diversity that exists within the Muslim world. According to Warde (2000), the socioeconomic dynamics, degrees of economic growth, and various interpretations of Shariah principles may vary significantly between Islamic nations. As a result, adopting a strategy that assumes one size fits all is likely to be ineffective.

Sukuk, also known as Islamic bonds, and Takaful, often known as Islamic insurance, are two examples of Shariah-compliant securities that provide concrete investment opportunities. On the other hand, what is more important than the instruments themselves are the initiatives that they fund. According to Wilson (2012), infrastructure projects, halal tourism, and Islamic fintech are three industries that are seeing rapid growth and presenting several profitable options. Not only are

these industries compatible with Islamic beliefs, but they also help many Islamic countries achieve their economic growth objectives.

Strategic consideration should also be given to collaborating and partnering with local organizations. According to Chong and Liu (2009), local partners have the ability to traverse the complexity of local traditions and regulatory contexts as well as grasp the subtleties of the unique interpretation of Shariah principles in a certain nation.

In this environment, the function of regulatory agencies, whether they national or international, is of the utmost importance. According to Archer and Karim (2009), the absence of uniformity in the interpretation and application of Shariah principles across nations might provide a formidable obstacle for foreign investors. A unified regulatory framework that is respectful of the concepts of Islamic finance while also assuring sound financial practices is required in order to create trust and promote Islamic financial transactions that take place across international borders. Although some organizations, such as the Islamic Financial Services Board (IFSB) and the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI), have made progress in this area, there is still much work to be done to bring Islamic finance into alignment with global financial standards while preserving the core values of Islamic law.

Investing in the Islamic world is not merely a foray into a financial system that forbids interest and speculators; rather, it is an immersion into a value-driven ecosystem that emphasizes ethical concerns, financial inclusion, and stability. In conclusion, investing in the Islamic world is not just a venture into a financial system that bans interest and speculations. The Islamic financial market is prepared to give enormous rewards, both real and intangible, to investors from all over the world, provided that the appropriate strategies are implemented and a profound grasp of both the financial instruments and the socio-economic backdrop is gained

Conclusion

Investing in the Islamic world, which is profoundly entrenched in the precepts of Shariah law, provides an unusual combination of ancient ideas and contemporary financial methods. This is because Shariah law is deeply established in Islamic tradition. The upward trend of Islamic finance over the last several decades is not just an indication of its flexibility; rather, it is also a testimonial to the powerful basic principles of Islamic banking and the possibility for global integration that it offers. The principles of risk-sharing, the prohibition of interest, and the connection of financial activity with actual assets have all contributed to the exceptional steadiness of the Islamic financial system. This stability was most clearly shown during the global financial crisis, when Islamic banks demonstrated exceptional resilience in comparison to their conventional counterparts (Beck, Demirguc-Kunt, & Merrouche, 2013). During this time, Islamic banks remained relatively unscathed.

The Islamic world is home to a diverse population that spans many continents and cultures, which adds another degree of complexity. Each location, with its own particular understanding of the Shariah principles, has its own particular set of difficulties. On the other hand, these difficulties bring to light a large pool of possibilities that are just waiting to be used. The promise cannot be denied, as seen by the rapidly developing Islamic fintech industry, which caters to a younger Muslim population that is tech-savvy, the surge in halal tourism, and the exponential expansion of Sukuk (Islamic bonds) in global markets (Wilson, 2012; Iqbal & Mirakhor, 2011).

Furthermore, as environmental, social, and governance (ESG) factors gain significance in global banking, the ethos of Islamic finance, which organically coincides with norms of sustainability and ethical conduct, stands out as a distinctive alternative. According to Saiti and Abdullah (2016), the model of Islamic finance might be used as a guide for organizations that want to integrate ethical issues more deeply into their business operations and investment plans.

When seen in retrospect, the path that lies ahead for Islamic finance seems not just to be promising but also to be transformational. Its expansion is not only an evolution of finance; rather, it represents the possibility of a revolution. The seamless integration of Islamic finance will surely

play a vital role in determining the course of the future, particularly in light of the increasing interconnectedness of the global financial environment.

If it is properly harnessed, the cumulative influence of Islamic financing has the potential to rewrite the rules that govern global finance. It is a reminder of the values that are sometimes put on the back burner in the pursuit of riches, while at the same time providing an alternative to traditional methods of operation. The fundamental principles that underpin Islamic finance have the potential to point global investors in the direction of a financial future that is more responsible, ethical, and ultimately sustainable.

Although the variety that exists within the Islamic world, the absence of uniformity in the interpretation of Shariah principles, and the possibility for cultural and regulatory problems to be obstacles for investors, it is arguable that the possibilities exceed the disadvantages. According to Wilson (2012), there is a massive unexplored market that is just waiting to be discovered thanks to the proliferation of Islamic fintech, infrastructure projects dedicated to Islamic principles, and the growing demand for halal tourism. The trajectory of Islamic finance seems to be positioned for an upward rise, and this trajectory may be maintained and even accelerated with coordinated efforts between foreign and local organizations, in addition to solid and harmonized regulatory frameworks.

Personally, I think that Islamic finance has the capacity to bring in a paradigm change in the way that the global investment environment is seen and operated. Islamic finance is more than just interest-free transactions and asset-backed financing; it is also an ideology that incorporates a dedication to ethical, transparent, and socially responsible financial dealings. The world of global finance is struggling with problems of trust and transparency, and there is a growing need for ethical investment. In this context, Islamic finance may very well offer some of the solutions to the urgent difficulties that are now being faced.

It is possible that Islamic banking, as it continues to expand and become more intertwined with the larger global financial system, will have enormous reverberating repercussions. It provides an alternate, a fresh perspective, through which one may examine investing, risk, and return. In a world that is becoming more linked and globalized, the principles of Islamic finance might act as a bridge, encouraging mutual understanding and perhaps guiding the global investing community towards a future that is more ethical and sustainable.

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THE IMPACT OF FISCAL POLICY ON OIL PRICES - THE CASE OF ALGERIA DURING THE PERIOD FROM 1970 TO 2022

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Abstract. *There is a consensus among experts in the field of economics that the weak economic performance of certain oil-exporting countries can be attributed to their approach in responding to fluctuations in petroleum prices. This is primarily due to the fact that in most of these countries, government expenditures are heavily reliant on revenues generated from the export of hydrocarbons. This research paper aims to examine the impact of petroleum price fluctuations on several macroeconomic indicators in Algeria from 1970 to 2022. These variables include the gross domestic product, petroleum price, currency rate, imports, and total income. The price of petroleum is regarded as the primary determinant of economic activity in Algeria. This may be demonstrated by the function of Batch responsiveness, which measures the responsiveness of variables to changes in petroleum prices.*

Keywords: *Financial Policy, Oil Prices, Stationarity, Co-integration, Response functions.*

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Introduction

Fiscal policy is one of the most important macroeconomic policies because it can help the national economy reach the most goals. This is because it has many tools that are some of the most important tools of economic management for promoting economic growth and getting rid of problems that hurt economic stability (Emmanuel & Olamide, 2018). Tools for economic policy that are both general and specific When it comes to how government spending and taxes affect aggregate demand and then macroeconomic factors, there are stabilizing effects.

Since then, fiscal policy has become a more important part of economic policy and a major tool for guiding the direction of the economy and dealing with shocks and crises (Akinboyo, 2020). It also has an effect on economic growth, especially in developing countries. In modern systems, fiscal policy has made it the state's job and obligation to guide the national economy in all of its parts, and fiscal policy has become a key part of the national economy's efforts to reach its goals.

Since the government owns the energy sector in most developing countries (Alley, 2016), fiscal policy is the most important way that money from oil exports goes into the local economy. On the other hand, the huge oil money is used to figure out how to handle economic policy. It makes the oil-producing countries more creditworthy and makes it easier for them to get loans from other countries. Since it is easier for the government to spend money and more people want the government to spend money (Rickne, 2009), the government spends more. In this case, the increase in oil revenues will cause a deficit in the balance of payments. This deficit is paid for by using future oil revenues as a guarantee to borrow money from outside the country. If oil revenues decline or stay the same instead of rising as expected, the gap between government income and spending will grow over time, which could lead to the country being in debt and unable to pay its bills.

From 1973 to 2022, the global petroleum market went through a series of tremors because of how it affected a number of different things (Chib & Benbouziane, 2019). These tremors finally showed up in the volatility of oil prices and led to a state of instability. All of this had effects that added up on oil economies and on growth in all its forms. Oil became a drug for many countries

(Adeosun & Fagbemi, 2019). Every day, policymakers around the world keep an eye on the global energy markets. This is because their economies are sensitive to every change in the price of oil, which is what they use to set their goals and objectives.

We used Algeria as a research model to back up this study and show how it fits into the bigger picture. Algeria's government gets most of its money from the oil and gas industry (Bouzid, 1999). The crisis of 1986, when prices on the oil market dropped sharply, is a good example from history. Spending is less than what comes in. This put pressure on fiscal policy and made it harder for it to adapt to changes in the local economy. From it, we can see the following parts of the study problem:

How does the government's fiscal strategy react to changes in the price of oil?

To solve the last problem, we came up with the following theories:

Hypotheses:

1. Oil-exporting countries can grow and have stable economies with the help of fiscal policy.

2. Because the Algerian economy was tied to the revenues from the hydrocarbon sector, the growth of the agricultural and manufacturing sectors slowed down significantly and clearly. This supports the idea that the Algerian economy was hit by the Dutch disease.

3. Trying to figure out what made oil prices go up in the first place.

4. A look at how changes in the price of oil affect Algeria's economic policies.

Literature Review

1. Fiscal policy in oil exporting countries:

Countries that export primary commodities have more drastic changes in their economic situation than countries with a more diverse economic base (Mahmah & Kandil, 2019). Most countries act based on their economic situation when deciding the role of fiscal policy, and the limits of flexibility depend on the stages of growth, the amount of resources available, and how realistic the goals are. That the country's fiscal policy plays a big role in moving the money made from oil to other key sectors (Afonso & Rault, 2010). This helps the country be more competitive and less likely to become too dependent on oil exports. Many economists say that the poor economic performance of some oil-exporting countries is due to how their governments respond to changes in the price of oil. This is because in most of these countries (Khan, Husnain,, & Abbas, Q., Shah, S.Z.A., 2019), government spending is closely tied to revenue from fuel exports, and changes in oil export revenues are caused by changes in the price of oil. Along with how the government spends money, this leads to a cyclical fiscal policy that hurts the businesses of oil-exporting countries in a big way.

1.1. Dutch disease:

The Dutch disease, also known as the "problem of raw materials boom", refers to the industrial decline caused by North Sea oil production and exports. Keynesian economists initially referred to this as the "problem of raw materials boom" due to the transfer of capital and floating exchange rates. In the 1970s, economic models were created to explain the impact of rising fuel prices, finding a mine, or wealth from outside sources on a particular sector. Cordon and Neary's 1982 study showed that the boom in exports had complicated effects on economic growth in other areas, leading to unemployment (Cordon & Neary, 1982). The Dutch disease was not limited to developing countries, hydrocarbons, or raw materials exports. Symptoms of the Dutch disease can also be caused by capital flows, such as foreign aid, foreign aid, or gold from South America.

Cordon used a three-part model to describe the signs and symptoms of the Dutch disease (Cordon & Max, 1982, p. 36):

a) Growing market,

b) Falling behind,

c) Commodities that can't be traded. The Cor Model, based on this case, has one moving factor, work, and other production factors unique to each sector.

There are two things that happen when a field grows (P & Van Wijnbergen, 1986):

a. What spending does:

Spending on non-tradable commodities causes short-term price increases, leading to increased national currency real prices. Export revenues also increase in the lagging sector, but these prices are set by markets. Higher non-tradable goods prices attract more workers, causing the falling sector to make less (Cordon & Neary, 1984, p. 86).

b. How materials are used:

Increased prices in the prosperous sector increase labor marginal product, leading to resource movement. This causes workers to move from the failing sector and non-tradable goods sector to the prosperous sector. Direct deindustrialization occurs when labor is moved from the second sector to countries, while indirect deindustrialization occurs when labor is moved from the lagging sector to the non-tradable goods sector (Cordon & Neary, 1982). The petroleum sector's small work use cancels out resource effects, and the rise in exchange rates causes the lagging sector to produce less and the non-returnable goods sector to produce more.

The Hamilton model for the production of a specific commodity provides a simple means of demonstrating the nature of the impact of oil price variations on the macroeconomic and fiscal policy on the portion of the inputs inside the production function (Hamilton, 1993).

$$y = f(L, K, E)\, y \tag{1}$$

Where: L It represents the labor and K capital component and E represents the cost of oil in the inputs, and the profit margin is in the following function:

$$pY - wL - rk - P_e E \tag{2}$$

Where: P It represents the price of the commodity and w the wage, and r it represents the interest on the capital, and P_e it represents the price of oil.

And in a fully competitive market, companies continue to supply the production chain with oil as long as oil prices are less than the marginal product of the energy component:

$$P_e = pF_e(L, K, E) \tag{3}$$

Where: F_e represents the derivative of the production function with respect to E and dividing it to pY so that we have the following equation:

$$\frac{P_e E}{PY} = \frac{F_e(L, K, E)}{E/Y} \tag{4}$$

Where: $\frac{P_e E}{PY}$ It represents the elasticity of production $\frac{F_e(L, K, E)}{E/Y}$. It represents the percentage of spending on oil out of the total production.

The percentage of oil use in production remained between 4% and 5% until the late 1970s, then increased to 8% during the reverse shock of oil (1979-1980). Since 2004, it has increased to 3.3%. Hamilton's model suggests that fluctuations in oil prices can lead to a decline in wages and jobs, frictional unemployment, and individuals not taking jobs in certain sectors due to their belief that their old jobs will become profitable. This highlights the potential impact of oil price fluctuations on production and unemployment.

The Woodford and Rotenberg model suggests that monopolies in markets may explain the impact of oil price fluctuations on the economy. They found that a rise in oil prices leads to a decline in production and a decrease in real wages. The economic model was modified to assume perfect competition conditions, and the effect of oil price fluctuations was limited. The effective model depends on implicit interdependence between companies, with fluctuations in oil prices causing a direct rise in unemployment rate and wages, followed by a decline in value after 14 months. Both mechanisms provide a logical explanation for oil price relationships with macroeconomics and public finances, but cannot explain changes in crude income output.

Materials and Methods

Algeria faces risks from oil price fluctuations due to its dependence on hydrocarbons. The 1986 crisis led to imbalances in macroeconomic balances, affecting development and growth. Algeria's budget is closely linked to oil price fluctuations, as the primary resource for government budgets is related to crude oil prices. These fluctuations impact hydrocarbon export revenues, which determine the country's capabilities in imports and public expenditure policy.

The oil shocks that the Algerian economy was exposed to, in addition to the instability and uncertainty in the global oil markets, are a result of the high correlation with oil, and therefore these fluctuations are reflected in the economic policies pursued by Algeria. In this applied study, we will demonstrate the impact of oil prices on some of the macroeconomic variables represented In: raw internal product, exchange rates, imports, total revenues, and the values of the variables to be studied, which we took from the International Monetary Fund (IFS/FMI) statistics, are heterogeneous in size, since some of them are calculated in dollars, so we entered the logarithm on all the variables. These The data is annual data for the period from 1970 AD to the year 2022, i.e. the size of the sample inquired is 52 observations, which is a rather small size from the minimum required to carry out these tests, and the variables to be studied are:

Table 1

Variable description and Data sources

Variable	Data source	Code
Gross domestic product	Data are taken from World Bank statistics and International Monetary Fund statistics	LGDP
Exchange rate	Expressing the exchange rate of the dinar in dollars, we symbolize it with the symbol ER, and after introducing the logarithm to it, we symbolize it with the symbol LER. The data is taken from statistics from the International Monetary Fund.	LER
Oil price	We denote it with the symbol (POILI), and after entering the logarithm it becomes “LPOILI”. Data are taken from World Bank statistics.	LPOILI
Imports	It is the value of the country's imports at current prices (CIF), and we symbolize it with the symbol (im). By inserting the logarithm, we change the symbol as follows: Lim.	im
Total revenues	It is the value of the country’s revenues, and we symbolize it with the symbol (RES). By inserting the logarithm, we change the symbol as follows: LRES. The data is taken from World Bank statistics.	RES

In this research, we try to investigate the type of variables that are considered stable or unstable, and if these variables are unstable, we test them according to the tests used, and what is their degree of integration?

2.1. The Unit root test:

One of the necessary conditions for performing simultaneous integration tests is that the time series be stable of the same degree, otherwise there can be no simultaneous integration relationship between variables, we use here the "ADF" test for single root.

Augmented Dickey Fuller Test "ADF":

The ADF test is based on the three basic models and on the following hypotheses (Bourbonnais, 2015):

$$H_0 = \phi_j = 1$$
$$H_1 = \phi_j < 1 \quad (5)$$

Accepting the nihilistic hypothesis H_0 means that there is a single root, from which the time series is unstable, and using the "OLS" method to estimate $øj$ in the three models. We get $t.Ø_j$. which is subject to the distribution of "Student", if it is $t.Ø_j$. The calculated value is greater than the tabular "Student" statistic, we accept the hypothesis H_0. That is, there is a single root.

But if it is $tøj$. Smaller than the tabular "Student" statistic, we reject the nihilistic hypothesis, accept the alternative hypothesis, and therefore the chain is stable.

Dickie Fuller rookie test "ADF" (1970-2022)

Using EVIEWS we get the following results:

Table 2

Dickie Fuller Rookie Test

Variable	Degree of delay "Lag Mic"	Calculated value "ADF ($t.\varnothing_j$)"	Probability of a single root (Prob-RU)
LPOIL	4	-0,815986	[0,9557]
LPIB	1	-2.051216	[0,5577]
LER	9	-1.915464	[0.6300]
LIM	9	-0.030002	[0,9942]
LRES	6	-0,977688	[0,9356]

Using the program "EVIEWS 8.0", the results in Table 1 show that the calculated value of "ADF ($t.\varnothing_j$)" is greater than the tabular critical values at the level of significance 10%; 5%; 1%. It also shows the probability of a single root, greater at all levels of significance, including the acceptance of the null hypothesis, and therefore all the variables of the study are unstable, and to return them stable, we apply the differences of degree (1) and show that the variables are still unstable and then we applied the differences of the second degree.

Table 3

ADF Test Second degree

Second degree 2-nd différence critical values					
10%; 5%; 1%	*(Prob)*		*Calculated value "ADF ($t.\varnothing_j$)"*	*Degree of delay "Lag Mic"*	*Variable*
$(-1{,}61)(-1{,}95)(-2{,}64)$	{	[0.0000]	-11.89710	0	∇ LPOIL
		[0.0000]	-6.856323	0	∇ Lpib
		[0.0000]	-8.548009	0	∇ LER
		[0.0000]	-10.58341	0	∇ LIM
		[0.0000]	-8.188984	0	∇ LRES

Using Eviews, the results from Table 2 are as follows:

Hence, all series are stable, and we reject the hypothesis H_0, so these time series of all variables are integrated of the second order at all levels of morality:

$$Ler.lpib.\lim.lpoil.lres \rightarrow CI(2) \quad 1\% \quad 5\% \quad 10\% \tag{6}$$

2.2. Simultaneous Integration Test:

We first determine the degree of delay of the variables, this determination is made using the Aic standard and the Schwartz standard, and then we perform the simultaneous integration test.

1.2.2. Determination of the degree of delay:

Using the Acai test and the Schwartz test, the proposed delay score is the first delay score (-3) because both tests cannot be calculated beyond this score, due to the small sample size taken from 1970 to 2022.

2.2.2. Cointegration test

After verifying the first condition, which is the stability of variables of the same degree, we estimate the long-term relationships by the method of "OLS", here we perform the Johansen Cointégration test to study the relationship in the long term or using the "Johansen" test of eigenvalues and the test of the maximum reasonableness ratio (the greatest probability) to find out the order of simultaneous integration.

The "Johansen" test is based on estimating the following model:

$$\Delta y_t = A_0 + A_1 . y_{t\text{-}p} + A_{1.} \Delta y_{t\text{-}1} + A_2 y_{t\text{-}2} + \ldots\ldots\ldots + A_{p\text{-}1} . \Delta y_{t\text{-}p\text{-}1} + \xi_T \tag{7}$$

In order to calculate the number of delays in the model, it is as follows:

$P=1$: The form is as follows:

$$\Delta y_t = A_0 + A_{1.}\Delta y_{t-1} + \xi_t \tag{8}$$

$P=2$: The form is as follows:

$$\Delta y_t = A_0 + A_2 y_{t-2} + A_{t-1}.\Delta y_{t-1} + \xi_T \tag{9}$$

$P=3$: The form becomes as follows:

$$\Delta y_t = A_0 + .\Delta y_{t-3} + \Delta y_{t-2} + \Delta y_{t-1} + \xi_T \tag{10}$$
$$\vdots$$

1. If $(r=0)$ (r: rank of matrix A).

In this case there is no "Cointegration" between the variables, and the debugging model (ECM) cannot be formed.

2. If $(r=k)$ (k: number of proposed variables).

In this case all variables are stable, and simultaneous integration is not subtracted.

3. If it is $(1 \le r \le k)$

In this case it exists a synchronous integration relationship, and the error correction model can be formed The rank of the matrix r determines the number of the simultaneous integration relationship between the variable.

From the special values of matrix A the statistic is calculated:

$$\lambda_{\text{Trace}} = -n.\sum_{i=r+1}^{k} \ln(1-\lambda_i) \tag{11}$$

λ_i: Values for the matrix.

N: Views.

r : Matrix rank.

k : Number of variables.

Results

3.1. Hypotheses of the Johansen test:

$$\begin{cases} H_0 : r = 0 \\ H_1 : r > 0 \end{cases} \tag{12}$$

If the hypothesis H_0 is rejected, we pass the second test, λ_{Trace} greater than the tabular critical values.

$$\begin{cases} H_0 : r = 1 \\ H_1 : r > 1 \end{cases} \tag{13}$$

If the null hypothesis H_0 is rejected, then the rank of the matrix is equal to k the number of variables studied $(r=k)$, hence there is no co-integratio‌n relationship between the variables because they are all stable.

Therefore, using Eviews and using the Johansen Test for Greater Eigenvalue and the Max-Eigenvalue test, we will try here to find a simultaneous integration relationship between the variables studied in the long term (Ler, Lpoil, Lpib, Lres, LiM).

H_0: There is no co-integration relationship.

H_1: Having a co-integration relationship.

Table 4
Concurrent Integration Rank Test (Johansen Test)

Date: 02/14/23 Time: 12:16				
Sample (adjusted): 1970 2022				
Included observations: 52 after adjustments				
Trend assumption: Linear deterministic trend				
Series: LER LIMP LPIB LPOIL				
Lags interval (in first differences): 1 to 1				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.590140	66.39256	47.85613	0.0004
At most 1*	0.326087	27.14722	29.79707	0.0981
At most 2	0.184716	9.782459	15.49471	0.2978
At most 3	0.017947	0.796845	3.841466	0.3720
Trace test indicates 2 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

From Table 3 we can extract the following results:

Hypothesis (1):

$r=0$ The calculated value "Max-Eigenvalue" (66.39256) is greater than the critical values at the level of 5%, (47.85613), so we reject the nihilistic hypothesis H_0 and accept the hypothesis H_1, that mean the existence of a simultaneous integration relationship.

Hypothesis (2):

$r=1$ The calculated value (27.14722) is greater than the critical values at the level of 5%, and the value of: (25.79707) Hence we reject the null hypothesis H_0 and accept H_1, the existence of a simultaneous integration relationship.

Therefore, we can conclude from Table 3 that there are two simultaneous integration relationships between the variables at the level of 5%.

We will test all possible cases in order to find these two relationships between the variables studied:

1. Granger test for synchronous integration:

To find the two relationships for simultaneous integration, we use the "Granger" test, which is one of the tests applied to the residuals (the remnants of the proposed equations), then we were able to extract these two relationships as follows:

The first relationship: oil price and crude domestic product [Lpoil-Lpib]: Using the "Granger" test and the "Eviews" program, the following result was obtained:

Table 5
Granger test for the cointegration of (oil price and crude domestic product)

P-Value	*ADF*	*"Lag Mic" delay*	*Residual*
[0,9812]	-0,013624	1	$e_t = ALpoil_t - Lpib_t$

We can see from the table that the calculated value of: ADF, is greater than the critical value and with a greater probability [0.9812] at the level of 1% we reject the hypothesis H_0 and accept . H_1 there is simultaneous integration between [Lpoil-Lpib].

Second Relationship: Oil Price and Exchange Rate [LPoil-Ler]:

Using the "Granger" test and the "Eviews" program, the following result was obtained:

Table 6
Granger test of the co-integration of the price of petroleum and the exchange rate

P-Value	*ADF*	*"Lag Mic" delay*	*Residual*
[0,9824]	-0,14521	3	$e_t = ALpoil_t - er_t$

By the table we reject H_0 and accept. H_1 That is, the existence of simultaneous integration between the price of oil and the exchange rate.

using the "Granger" applied to the remainder of the equations proposed in the model, we were able to obtain two relationships for simultaneous integration in the long term:

1) A relationship of mutual integration between the price of oil and the gross domestic product.

2) A common integration relationship between the price of oil and the exchange rate.

2. Causal Relationship Test:

We will try to test the direction of causal relationships using the "Granger" method between all the studied variables (lpib.lm2.lcrd.lpm.lpg) and here we try to show what variable affects the other, the first affects the second or the second in the first, or they are affected by each other at the same time, and from the conditions for studying the causal relationship all the variables used must be stable of the same degree.

Granger causal test:

First case:

Table 7

Granger causality test between oil price and GDP [Lpoil-Lpib]

Pairwise Granger Causality Tests			
Date: 02/14/23 Time: 12:44			
Sample: 1970 2022			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
LPOIL does not Granger Cause LPIB	52	2.91711	0.0660
LPIB does not Granger Cause LPOIL		4.84818	0.0132

We notice through Table 7 that the values (F): (2.91711) and (4.84818) are the largest tabular values at the level of 1% and 5%, and using the probability [0.066] is greater at the level of %1 and thus we reject the null hypothesis, that is, the existence of a causal relationship between the two variables, meaning there is a causal relationship from the differential of D(Lpoil) to the differential of D(Lpib). As for the second relationship, we also note that the probability of [0.0132] is greater at the level of 1% and 5%, and from it there is a causal relationship in both directions.

Second case:

Table 8

Granger causal test between petroleum price and exchange rate

Pairwise Granger Causality Tests			
Date: 02/14/23 Time: 12:48			
Sample: 1970 2022			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
LER does not Granger Cause LPOIL	52	2.76993	0.0750
LPOIL does not Granger Cause LER		0.76446	0.4724

We can see from the table in the first relationship that the value of F [2.76993] is greater at the level of %1 and %5, and from it the null hypothesis is rejected, i.e. the existence of a causal relationship between the two variables. The second relationship from [Ler] to [Lpoil] differential is that the probability value [0.47] is greater at the level of 1%, and from it we reject the null hypothesis, i.e. there is a causal relationship between the price of oil and the exchange rate, and from it there is a causal relationship in both directions.

3. Analysis of response functions:

The "Granger" causality test shows a relationship between the variables, and to show this relationship, we calculate the response functions for all the variables under study, we note, for example, from the form of the response functions the variables of the effect of the change in the oil price variable on the other total variables.

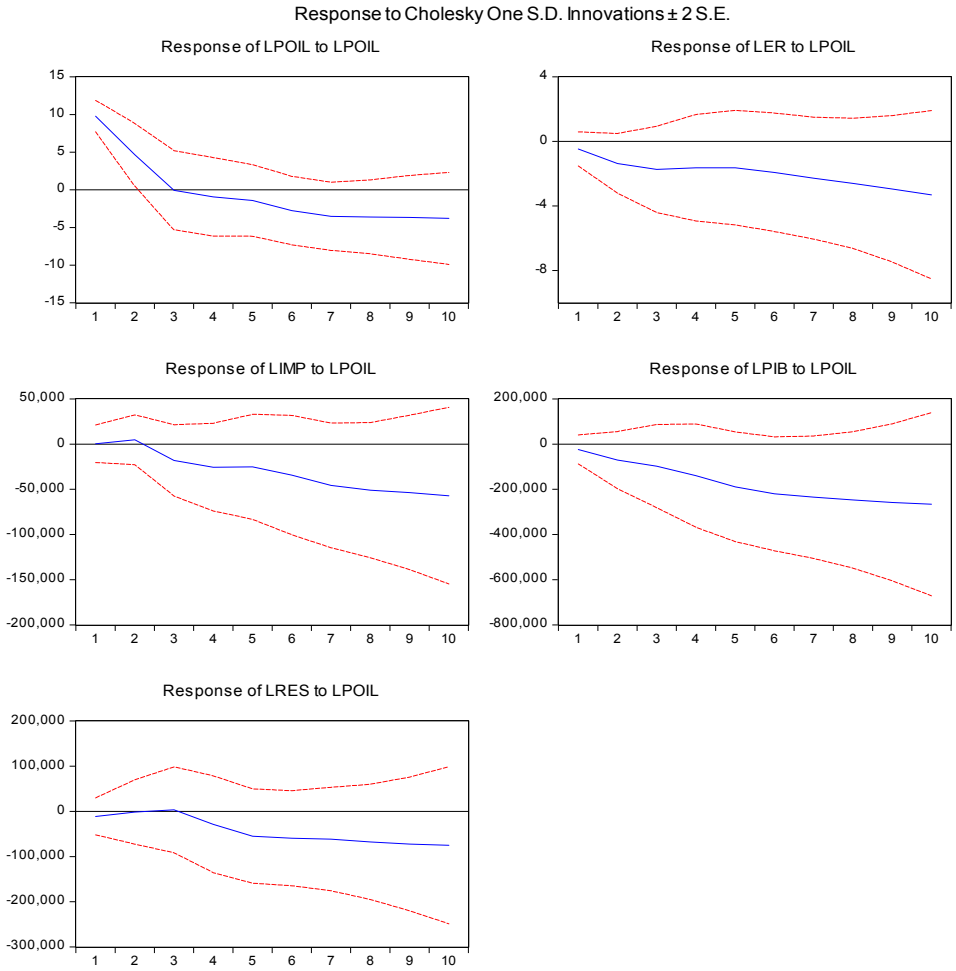

Figure 1. Form of the response functions

Source: calculated by the authors

4. Estimation of the Standard Model: The results of the econometric analysis of the impact of independent variables on the price of oil in Algeria indicated the following:

Table 9
Estimation of the Standard Model

Dependent Variable: LPOIL				
Method: Least Squares				
Date: 02/14/23 Time: 13:05				
Sample: 1970 2022				
Included observations: 52				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LPIB	1.471205	6.442306	2.286030	0.0275
LIMP	5.445605	1.915205	2.850547	0.0068
LER	0.788709	0.200453	-3.934630	0.0003
LRES	3.528605	1.345605	-2.623669	0.0122
C	16.98852	2.984648	5.691967	0.0000
R-squared	0.984512	Mean dependent var		33.52435
Adjusted R-squared	0.959343	S.D. dependent var		31.26350
S.E. of regression	12.91518	Akaike info criterion		8.057005
Sum squared resid	6838.873	Schwarz criterion		8.255771
Log likelihood	-180.3111	Hannan-Quinn criter.		8.131464
F-statistic	55.67151	Durbin-Watson stat		1.992955
Prob(F-statistic)	0.000000			

Hence, the estimated equation becomes as follows:

$$lpoil = 16.98 + 1.47\,lpid + 5.44\,\lim + 0.78\,ler + 3.52\,lres \quad (14)$$

Statistical analysis: The coefficient of determination (R2) indicates that the independent variables affecting the price of oil in Algeria, namely GDP, exchange rate, imports, total revenues explain only 98.45 percent of the changes in the price of oil and 1.55 percent due to other variables that were not included in the model, and the parameters of the model are significant depending on the test (DW) on the absence of the model from the problem of self-correlation, and we did not find that the model means from the problem of instability of homogeneity of variance.

The heteroscedasticity test aims to determine whether there is an inequality of residual variance for all observations in the linear regression model. The heteroscedasticity test can be done with the Harvey test. The decision-making is based on the probability figures from the result of the Harvey test. The results of the heteroscedasticity test can be seen below.

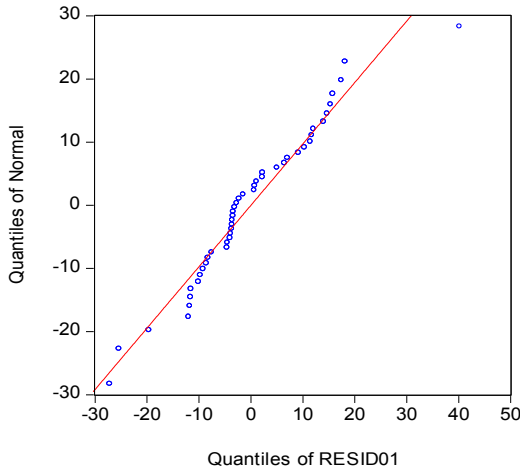

Figure 2. Propagation of residues of the first model

Source: calculated by the authors

The second model: the relationship can be estimated in its standard form as follows:

Table 10

Estimation of the Second Model

Dependent Variable: LPIB				
Method: Least Squares				
Date: 02/14/23 Time: 13:30				
Sample: 1970 2022				
Included observations: 52				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LPOIL	76.74987	3357.343	2.286030	0.0275
LER	26.71633	3381.282	7.901241	0.0000
LIMP	0.368559	0.473473	0.778417	0.4408
LRES	1.352926	0.254146	5.323427	0.0000
C	18.26321	86578.41	-2.109441	0.0411
R-squared	0.984641	Mean dependent var		3266451.
Adjusted R-squared	0.914119	S.D. dependent var		3844156.
S.E. of regression	294807.8	Akaike info criterion		28.12836
Sum squared resid	3.568612	Schwarz criterion		28.32712
Log likelihood	-641.9522	Hannan-Quinn criter.		28.20282
F-statistic	1902.581	Durbin-Watson stat		1.942127
Prob(F-statistic)	0.000000			

Hence, the estimated equation becomes as follows:

$$lpib = 18.98 + 76.74\,lpoi + 26.71\,ler + 0.36\,\lim + 1.35\,lres \quad (15)$$

Statistical analysis: The coefficient of determination (R2) indicates that the independent variables affecting the GDP, namely, exchange rate, imports, total revenues, oil price, explain only 98.46 percent of the changes in GDP, and the parameters of the model are significant depending on the (DW) test.

The third model: the relationship can be estimated in its standard form as follows:

Table 11
Estimation of the Third Model

Dependent Variable: LRES				
Method: Least Squares				
Date: 02/14/23 Time: 13:44				
Sample: 1970 2022				
Included observations: 52				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LPOIL	4.089619	1558.740	-2.623669	0.0122
LPIB	0.302087	0.056747	5.323427	0.0000
LIMP	0.918593	0.173822	5.284682	0.0000
LER	9.676054	2038.718	-4.746146	0.0000
C	72.63677	41553.07	1.748048	0.0879
R-squared	0.983813	Mean dependent var		1321156.
Adjusted R-squared	0.963209	S.D. dependent var		1690446.
S.E. of regression	139305.3	Akaike info criterion		26.62905
Sum squared resid	7.9632511	Schwarz criterion		26.82781
Log likelihood	-607.4680	Hannan-Quinn criter.		26.70350
F-statistic	1646.359	Durbin-Watson stat		1.983684
Prob(F-statistic)	0.000000			

Hence, the estimated equation becomes as follows:

$$lres = 72.63 + 4.089\,lpoil + 9.67\,ler + 0.91\,\text{lim} + 0.3\,lpib \quad (16)$$

Statistical analysis: The coefficient of determination (R2) indicates that the independent variables affecting the total revenues explain the changes that have occurred, and the parameters of the model are significant depending on the (DW) test.

Conclusion

Through this research, we have studied and analyzed the response of fiscal policy to the fluctuations of oil prices and the impact of these fluctuations on some macroeconomic variables and by applying the method of joint integration to the economic variables under the proposed study, we found that all the variables studied: gross domestic product, oil price, exchange rate, imports, total revenues are second-class integrals, then using the test (Johansen) on the three basic models we found the ranks of simultaneous integration There are two relationships for joint integration, which is the first relationship Between the price of oil and the gross domestic product and the second between the price of oil and the exchange rate. The results showed that the price of oil is among the most important determinants of economic activity in Algeria through what was shown by the impulse response functions to the response of variables to the change in the price of oil.

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JEL Classification: L00; L60; L69

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EMPIRICAL INVESTIGATION INTO THE IMPACT OF INTER-ORGANISATIONAL INFORMATION SYSTEMS ON SUPPLY CHAIN PERFORMANCE

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Abstract. *During the past few years, the pandemic of COVID-19 has significantly disrupted supply chains. Indeed, these chains are facing multiple challenges, such as designing new products to adapt to the disruptions of their markets and to maintain their profit margins and ensure their survival. Thus, this paper aims to explore the influence of inter-organizational information systems on supply chain performance by studying the role of risk management culture, collaboration, and agility and supply chain resilience. Data was collected online using a self-administered questionnaire from company executives in the automotive industry. The findings based on structural equation modeling highlighted a number of practical recommendations for automotive company managers on how to improve the level of supply chain performance.*

Keywords: *information systems, automotive industry, risk, performance, agility.*

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Introduction

In a volatile, indecisive context of permanent crisis with multiple causes: health, economic, natural disasters; companies find themselves forced to look for solutions to adapt and maintain the level of performance that can be envisaged. More specifically, over the last few years, the COVID-19 pandemic has had a profound impact on the international economy, raising unprecedented challenges for our lives (Francis, 2020). Therefore, supply chains (SC) are facing several challenges, including the design of new solutions to adapt to the upheavals in their markets and taking the right decisions to maintain their profit margins and, in extreme cases, ensure their survival (Montoya-Torres et al. 2021). To achieve this, and in the face of this turbulent environment, most industrial companies have opted to synchronise their physical and information flows by adopting sophisticated IS, with the ultimate aim of satisfying customers, while meeting several criteria: offering the right product, in the right place, in the right condition, at the right price, and at the right time (Lin, 2022). Indeed, in recent years, companies have been investing more and more in business-oriented technological tools to boost their performance. This has led logistics managers to question the congruence of these colossal investments and their impact on overall performance.

The study of the impact of inter-organisational IS on performance continues to arouse the interest of several management science researchers and IS management professionals (Chong et al. 2019). Thus, our research is part of this perspective and is in line with research work analysing the contribution of inter-organisational information systems (IOIS) as a vector for improving the

agility, resilience and performance of the supply chain (Chen, 2019; Francis, 2020; Mandal et al. 2016). In view of the above, the central question of our research is as follows: How does IOIS impact supply chain collaboration, agility, resilience and performance?

This paper is organised into four sections. The first section focuses on the literature review and justifies the choice of research hypotheses. Section 2 then presents the methodological approach used to test the hypotheses and the research model. Section 3 will be devoted to presenting and discussing the results of validating the measurement models and testing the hypotheses. The final section will conclude by highlighting the main contributions of this research, its limitations and future avenues of research.

Literature Review

Inter-organisational information systems

Management science literature offers a wide range of definitions of information systems (IS). This section presents the definitions most widely accepted by management science researchers. An information system can be defined as "an organised set of resources: hardware, software, personnel, data, procedures for acquiring, processing, storing and communicating information (in the form of data, text, images, sound, etc) within organisations" (Reix, 2004). To complete this definition, Reix (2004) has proposed a classification of IS by distinguishing, on the one hand, information systems that support operations (transaction processing, support for office and communication operations) and, on the other hand, systems that support management (report production, decision support). This definition highlights the procedural content of the information system, emphasising the interactions between its constituent elements. O'Brien (2011) defines the IS as "a structured set of human, hardware and software resources, data and communication networks which collect, transform and disseminate information within a company". Thus, in line with this work, we consider the IS to be a set of resources (material and human), in this case the interaction between these resources will enable us to gain a better understanding of how the logistics IS works.

Inter-organisational information systems (IOIS) represent a category of information systems that enable different organisations to communicate and collaborate with each other by sharing information and data (Kauremaa & Tanskanen, 2016). These systems are often used to improve the effectiveness and efficiency of business processes between partner organisations. They facilitate communication and collaboration between different organisations by enabling them to share information and data. IOIS are designed to support inter-organisational business processes and activities, including areas like SC management, logistics, and customer relations management (Kauremaa & Tanskanen, 2016). These IOIS can take different forms, ranging from simple data exchange mechanisms such as electronic data interchange (Klapita, 2021), to complex systems that involve multiple organisations and support complex business processes such as enterprise resource planning systems (Ahmad, 2022). IOIS can also include web-based platforms that enable organisations to collaborate and share information in real time, such as cloud-based platforms for data sharing and collaboration.

Role of inter-organisational IS in the supply chain

Christopher (2016) points out that the proper functioning of the SC depends on the proper circulation of information flows within and outside the company. Other researchers add that this is possible thanks to the use of inter-organisational IS (Bernasconi, 1996). The operation of the SC is accompanied by two types of integration. The first, known as cross-functional integration, enables the integration of all business processes from upstream to downstream (Tyndall et al. 1998). The second category, referred to as inter-organizational collaboration, relies on a network of partnerships among companies that mutually commit to exchanging information, sharing risks and rewards, ultimately resulting in a competitive edge (Cooper & Ellram, 1993). The pull-flow approach to logistics has only increased the fear of multiple hazards (late deliveries, stock-outs, etc.). In this sense, the level of logistical risk has become a key indicator to monitor, not only for the

company itself, but also for those involved throughout the supply chain (Bernasconi, 1996). The SCIS is thus the nervous system of supply chains. IS are essential to the smooth running of the supply chain, enabling logistics information to be analysed quickly and collectively in order to make effective decisions (Qrunfleh & Tarafdar, 2014). Through this literature review, we can confirm the inseparable link between SCM and the use of IOIS. This link emphasises that IOIS represents an organisational component that facilitates intra- and inter-organisational coordination (Qrunfleh & Tarafdar, 2014). In this sense, the use of IT accompanied by strong collaboration leads to the joint creation of knowledge, the sharing of expertise and the understanding of the partner's strategic intentions and approaches (Sinkovics & Roath, 2004). IOIS offer several benefits to organisations, such as improving efficiency, reducing costs, improving communication and supporting innovation. They can also help organisations to better understand and manage their supply chain, streamline processes and improve competitiveness (Hannila et al. 2019).

Based on previous work (Chen, 2019; Liu et al. 2018; Lu et al., 2006; Mandal et al., 2016; Sundram et al., 2018), we proposed the following research model.

w are various concepts from the author's point of view regarding family ownership, family business, clan governance and tribal governance.

From the definitions of Table 1 and Table 2 that the authors reveal about family ownership, clan governance and tribal governance there is a related relationship. We make a groove like the one below.

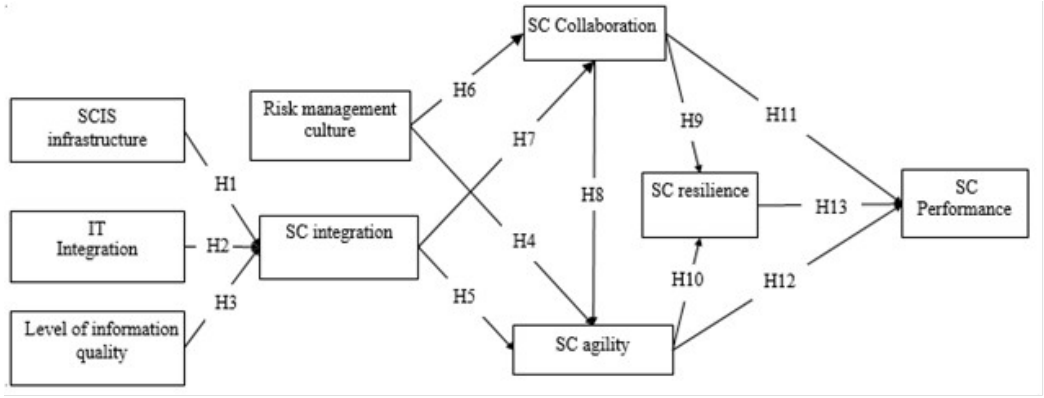

Figure 1. Conceptual research model

Methods

The choice of the automotive industry in Morocco as the field of empirical investigation can be explained by the fact that Morocco has succeeded in positioning itself as a global hub for the automotive industry. Many stakeholders interact within the automotive industry, including designers, third-tier suppliers, second-tier suppliers, first-tier suppliers, the original equipment manufacturer, transporters and distributors.

Operationalization of the constructs and development of the questionnaire

The measurement model comprises various key variables, each assessed through a specific set of items and associated with relevant authors' work. These variables include SC information system infrastructure (ISICA) with five items identified by Sundram et al. (2018), IT integration (ITICA) assessed by five items from Chen (2019), level of information quality (NQI) gauged through five items as outlined by Ragu-Nathan et al. (2006), SC integration (ISA) with five items by Sundram et al. (2018), risk management culture (CGR) evaluated through six items based on Liu et al.'s (2018) research, SC collaboration (CCA) assessed using five items derived from Salam's (2017) work, SC agility (ACA) measured by eight items proposed by Chen (2019), SC resilience (RCA) with four items associated with Mandal et al. (2016), and finally, SC performance (PCA) evaluated with five items from the research conducted by Chowdhury et al. (2019). Thus, a set of 48 items measuring the 8 latent variables was selected. these measurement scales were translated from english to french. Forr all the questions, we used the Likert scale with seven intervals. Given the

impossibility of carrying out face-to-face data collection due to the pandemic crisis caused by COVID-19, we opted for online data collection. To ensure that respondents understood the questions during the data collection phase, we undertook a pre-test. This test as carried out with two teacher-researchers in management sciences, and ten SC professionals. This pre-test was conducted to ensure that the questionnaire is easily understood by the survey participants. On the basis of the comments raised, we were able to make changes to the questionnaire.

Sampling method

Since they do not require a sampling basis, management science researchers often use purposive sampling methods to constitute the study sample. Compared to our study, where access to a sampling base of all the logistics managers and directors of companies belonging to the automotive supply chain remains an impossible task, we have chosen non-probability sampling methods. At this stage, the convenience sampling method was chosen for our study, in an attempt to distribute the questionnaire to professionals in automotive supply chain companies.

Questionnaire administration and data collection

Given the impossibility of carrying out face-to-face data collection due to the pandemic crisis caused by COVID-19, we preferred to administer the questionnaire electronically via online data collection. At this stage, the questionnaire was put online using Google forms. The questionnaire was administered between January and May 2021. During this period we collected 185 responses, including 4 that could not be used, giving a total of 181 valid and usable responses. From Table 1, it is clear that the majority of responses came from men (76.8%). In terms of the position held by the participant in our survey, it appears that the data collected comes from different decision-making levels. The majority of respondents are logistics coordinators (20.44%), production planners (16.57%), and logistics managers (16.20%). In terms of level of education, the descriptive statistics show that the majority of respondents have a master's degree (61.88%).

Table 1
Characteristics of the study participants

Measures	Categories	Headcount	Percentage
Gender	Woman	42	23,20%
	Man	139	76,80%
Formation	Bachelor +2	1	0,55%
	Bachelor +3 (Licence)	67	37,02%
	Bachelor +5 (Engineer, Master)	112	61,88%
	MBA	1	0,55%
City	Tangier	168	92,82%
	Casablanca	10	5,52%
	Kenitra	3	1,66%
Experience	Less than a year	7	3,87%
	From 1 to less than 3 years	38	20,99%
	From 3 to less than 5 years	61	33,70%
	From 5 to less than 7 years	49	27,07%
	Over 7 years old	26	14,36%

In this study, we employed partial least squares structural equation modeling (PLS-SEM) to assess hypotheses. This technique is well suited for investigating the impact of Inter-organisational Information Systems (IOIS) on supply chain performance due to its proficiency in handling complex, multifaceted relationships even when dealing with limited sample sizes (Hair et al., 2021).

Results

Measurement models model testing results

The level of convergent validity is verified by checking a set of indices: the factor contribution, the average variance extracted (AVE) and the composite reliability (CR). As shown in the table below, the factor contribution of the various indicators is well above the recommended value of 0.7 (Table 2). Likewise, Cronbach's alpha values are above 0.7, confirming that all the measurement models are reliable. In addition, for all constructs the value of the composite validity

is well above the minimum threshold of 0.7. Finally, the value of the average variance extracted from all the measurement models is well above the pre-requisite threshold of 50%.

Table 2
Convergent Validity Assessment

Constructs	Factor contribution (>0.7)	α	CR	AVE
Supply Chain information system infrastructure	0.919 0.955	0.964	0.972	0.875
Supply chain IT integration	0.894 0.959	0.961	0.970	0.866
Level of information quality	0.956 0.974	0.982	0.986	0.933
Supply chain integration	0.898 0.981	0.979	0.983	0.922
Risk management culture	0.929 0.966	0.979	0.983	0.907
Supply Chain Collaboration	0.905 0.957	0.967	0.974	0.883
Supply chain agility	0.891 0.970	0.986	0.988	0.914
Supply Chain Resilience	0.872 0.953	0.946	0.962	0.862
Supply Chain Performance	0.740 0.928	0.912	0.935	0.744

Table 3 shows the results of the discriminant validity test using the Fornell-Larcker criterion. Based on the results obtained, it appears that the root square of the AVE of the constructs is significantly higher than the correlations of this construct with the other constructs.

Table 3
Assessment of discriminant validity based on Fornell-Larcker criterion

Variables	1	2	3	4	5	6	7	8	9
Supply chain agility (1)	**0.956**								
Collaboration (2)	0.780	**0.940**							
Risk management culture (3)	0.788	0.768	**0.952**						
IS infrastructure (4)	0.791	0.674	0.700	**0.936**					
Supply chain integration (5)	0.834	0.738	0.778	0.817	**0.960**				
IT integration (6)	0.761	0.669	0.725	0.769	0.846	**0.931**			
Information quality (7)	0.785	0.721	0.706	0.767	0.830	0.702	**0.966**		
Supply Chain Performance (8)	0.794	0.787	0.969	0.706	0.780	0.737	0.693	**0.863**	
Supply chain Resilience (9)	0.734	0.841	0.753	0.666	0.697	0.680	0.598	0.788	**0.929**

Henseler et al (2015) indicate that HTMT values should be less than 0.90 to judge discriminant validity. According to Table 5, the measurement models in our model research pass this test since the highest HTMT value was 0.89. This confirms the constructs discriminant validity.

Table 4
Assessment of discriminant validity based on HTMT

Variables	1	2	3	4	5	6	7	8	9
Supply chain agility (1)									
Collaboration (2)	0.797								
Risk management culture (3)	0.802	0.787							
IS infrastructure (4)	0.811	0.697	0.718						
Supply chain integration (5)	0.849	0.757	0.794	0.841					
IT integration (6)	0.776	0.690	0.744	0.796	0.867				
Information quality (7)	0.797	0.739	0.720	0.785	0.846	0.719			
Supply Chain Performance (8)	0.835	0.837	**0.896**	0.750	0.824	0.782	0.732		
Supply chain Resilience (9)	0.760	0.879	0.781	0.696	0.724	0.714	0.618	0.847	

Structural model testing results

After validating the measurement models for the different latent variables, the second phase consists of verifying the internal model, with reference to several criteria. Table 6 shows that the coefficient of determination (R^2) values for the various endogenous latent variables in our study are greater than 0.67. This reflects a high level of determination for these variables.

The f^2 index is an indicator that measures the size effect of an exogenous latent variable on an endogenous latent variable. The results obtained show that the f^2 values of the exogenous latent variables on the endogenous latent variables (Table 6) are acceptable (Cohen, 1988).

Table 5
Coefficient of determination for endogenous latent variables

Endogenous latent variables	R Square	R Square Adjusted	Interpretation
Supply chain agility	0.771	0.767	Strong
Supply Chain Collaboration	0.640	0.636	Moderate
Supply chain integration	0.838	0.835	Strong
Supply Chain Performance	0.731	0.727	Strong
Supply Chain Resilience	0.723	0.720	Strong

Table 6
Size effect values of exogenous variables on endogenous variables

Exogenous variable		Endogenous variable	Value	Interpretation
Information System Infrastructure		SC integration	0.075	Weak
IT Integration			0.430	Strong
Level of information quality			0.334	Moderate
SC Integration		SC Collaboration	0.138	Weak
		SC agility	0.328	Moderate
Risk management culture		SC Collaboration	0.266	Moderate
		SC agility	0.067	Weak
SC Collaboration		SC agility	0.111	Weak
		SC Resilience	0.665	Strong
		SC Performance	0.038	Weak
SC Agility		SC Resilience	0.056	Weak
		SC Performance	0.213	Moderate
SC Resilience		SC Performance	0.108	Weak

The findings displayed in Table 7 provide confirmation that all Q^2 index values surpass zero, signifying the predictive significance of the constructs for the endogenous construct. In addition, the GoF index stands at 0.806, indicating a notably high level of model fit quality, well exceeding the recommended threshold of 0.36 set by Henseler, Ringle, and Sinkovics (2009).

Table 7
Predictive power of the model

Constructs	SSO	SSE	QI	Validity
Supply Chain Agility	1448.000	439.638	0.696	Acceptable
Supply Chain Collaboration	905.000	403.186	0.554	Acceptable
Risk management culture	1086.000	1086.000		
SC Information System infrastructure	905.000	905.000		
Supply Chain Integration	905.000	214.429	0.763	Acceptable
IT Integration	905.000	905.000		
Level of information quality	905.000	905.000		
Supply Chain Performance	905.000	426.216	0.529	Acceptable
Supply Chain Resilience	724.000	277.092	0.617	Acceptable

The results of testing the research model and the hypotheses using the SmartPLS software led to the acceptance of eleven (11) hypotheses and the rejection of two hypotheses. As shown in Table 8, our results display the non-significance of the relationship between IS infrastructure and SC integration (H1. $\beta = 0.198$; $t= 1.940$, $p= 0.053$). SC integration is influenced mainly by the two variables: IT integration in the supply chain (H2. $\beta = 0.429$, $t = 3.946$, $p = 0.000$) and the level of information quality (H3. $\beta = 0.377$, $t = 4.331$, $p = 0.000$). Thus, technology integration contributes more ($\beta = 0.429$) to the determination of SC integration, than the level of information quality ($\beta = 0.377$). These variables contribute up to 0.838 (R^2 = 83.8%) to the explanation of supply chain integration. In short, we can conclude by rejecting the first hypothesis (H1), and validating the second and third hypotheses (H2 and H3). The tests show a positive relationship between supply chain integration and collaboration between supply chain participants (H4. $\beta = 0.355$). The relationship between these two variables is significant ($t = 3.398$, $p= 0.001$). This fourth hypothesis is therefore accepted. The level of collaboration within the supply chain is determined at 0.640 (R^2

= 64%). The fifth hypothesis, which assumes a significant and positive effect of supply chain integration on SC agility, was confirmed (H5. β = 0.465, t = 4.378, p = 0.000). The results confirm the positive impact of risk management culture on supply chain collaboration (H6. β = 0.492, t = 5,209, p = 0.000) and supply chain agility (H7. β = 0.222, t = 2,730, p = 0.007*). The β coefficient of the effect of risk management culture on SC collaboration (H6. β = 0.492) is higher than its effect on SC agility (H7. β = 0.222). The level of supply chain agility is determined to be 0.771 (R^2 = 77.1%).

Table 8
Hypothesis testing results

Associations		β	T Statistics	P Values
H1 SCIS infrastructure	SC Integration	0.198	1.940	0.053 NS
H2 IT Integration	SC Integration	0.429	3.946	0.000***
H3 Level of information quality	SC Integration	0.377	4.331	0.000***
H4 SC Integration	SC Collaboration	0.355	3.398	0.001***
H5 SC Integration	SC Agility	0.465	4.378	0.000***
H6 Risk management culture	SC Collaboration	0.492	5.209	0.000***
H7 Risk management culture	SC Agility	0.222	2.730	0.007**
H8 SC Collaboration	SC Agility	0.266	2.272	0.024*
H9 SC Collaboration	SC Resilience	0.686	5.799	0.000***
H10SC Agility	SC Resilience	0.200	1.572	0.117NS
H11SC Collaboration	SC Performance	0.208	2.186	0.029*
H12SC Agility	SC Performance	0.393	4.225	0.000***
H13SC Resilience	SC Performance	0.325	3.495	0.001**

Data analysis based on structural equation modelling indicates that collaboration within the supply chain has a positive and significant effect on supply chain agility (H8. β = 0.266; t = 2.272; p = 0.024). Thus, this eighth hypothesis is confirmed. The level of SC resilience was determined to be 0.723 (R^2 = 72.3%). The results identify a positive and significant relationship between SC collaboration and SC resilience (H9. β = 0.686; t = 5.799; p = 0.000). The ninth hypothesis is therefore confirmed. The PLS analysis shows that there is no significant relationship between supply chain agility and supply chain resilience (H10. β = 0.200; t = 1.572; p = 0.117). As a result, this tenth hypothesis is rejected. Based on the results obtained, we can identify that collaboration between supply chain members, supply chain agility and resilience strongly contribute to the explanation of SC performance. Collaboration within the supply chain has a positive and significant effect on SCperformance (H11), with a beta coefficient of 0.208 and a significance level of 0.029. According to the PLS analysis, it is evident that SC agility has a direct and substantial impact on SC (H12. β = 0.393; t = 4.225; p = 0.000). As a result, this twelfth hypothesis is confirmed. Finally, resilience contributes positively and significantly to the explanation of automotive SC performance (H13. β = 0.325; t = 3.495; p = 0.001). SC collaboration, agility and resilience contribute to the explanation of SC performance with a level of determination of 73.1%.

Discussion

Contrary to previous work that has concluded that the supply chain IS infrastructure (H1) is an essential element to ensure supply chain integration (Sundram et al., 2018), our results highlight the lack of relationship between these two variables. The results allow us to identify the integration of IT (H2) and the level of information quality (H3) as two determinants of supply chain integration. These results are in strong agreement with previous research which suggests that IT integration can improve SC agility (Li et al., 2009). At this point, Cooper and Tracey (2005) have asserted that IT integration plays a crucial role in promoting efficient interaction and collaboration, thereby facilitating genuine business process integration among SC partners.

The association between the level of information quality and SC integration (H3) was confirmed. As a result, companies in the automotive industry can work together to improve the level of information quality in order to facilitate supply chain integration. As previous work indicates, information sharing is an essential element in relationship building and an organisation's willingness to share proprietary information is often seen as a good indication of its readiness to

develop integrated decision making. Thus, improving the quality of information encourages companies to trust each other, which leads to better SC integration (Vivek et al. 2011).

Analysis of the data using PLS modelling allowed us to accept the hypothesis linking SC integration and collaboration within the supply chain (H4). These results are in accordance with previous research which generally supports that supply chain integration can lead to the establishment of inter-firm collaborations (Pagell, 2004).

The research results confirm the relationship between SC integration and supply chain agility (H5). These results are in accordance with previous works that indicate that both internal and external integration constitute a basis for establishing an agile SC (Shukor et al. 2020).

The results confirm the hypothesis that risk management culture has a direct and positive influence on inter-organisational collaboration (H6) and SC agility (H7). Several previous studies have confirmed the importance of risk management culture as a determinant of SC agility (Liu et al., 2018). As Sheffi and Rice (2005) suggest, the establishment of a risk management culture enables risk management procedures to be effectively incorporated throughout an organisation's operational structure, ensuring the normal functioning of the supply chain. Liu et al (2018) have empirically confirmed that risk management culture can help enhance business agility, enabling companies to easily respond quickly to market changes.

The research results affirm that collaboration between SC members has a positive impact on the level of SC agility (H8). The validation of this discriminating hypothesis is aligned with several previous research studies (Dubey et al., 2021). Lee (2004) supports the idea that collaboration is an essential element of SC agility. Furthermore, these results support hypothesis (H9) which suggests that collaboration positively and directly affects the level of SC resilience. Several empirical research studies have confirmed this relationship (Kang & Moon, 2016).

In a supply chain, it is necessary to align the activities, routines and processes of individual companies in a synchronised way to reap the benefits of collaboration. In particular, in the event of disruption, the resilience of a supply chain can only be achieved if all the companies involved in a supply chain collaborate and react synergistically (Jüttner & Maklan, 2011). This indicates that supply chain collaboration is a prerequisite for SC resilience. Mandal et al (2016) confirmed the direct influence of collaboration between SC members and SC resilience. Contrary to previous works that confirm the positive influence of agility on supply chain resilience (Fayezi et al. 2015), the results of our research invalidate the relationship between these two variables (H10).

Our results confirm the positive and direct impact of collaboration on SC performance (H11). As emphasised by management studies, inter-organisational collaboration is an important factor in performance (Boubker et al. 2023; Mofokeng & Chinomona, 2019). These results also confirm the relationship between SC agility and SC performance (H12). The confirmation of this hypothesis aligns with the findings of previous research (Naoui et al. 2023; Blome et al. 2013). Likewise, the last hypothesis, which assumes the influence of resilience on SC performance (H13), was accepted. These results are in line with previous studies that support that developing tangible and intangible resilience capacities will lead to better SC performance (Wieland et al. 2013).

Conclusion

The objective of this study was to investigate the impact of inter-organizational information systems on enhancing supply chain performance. The findings have enabled the formulation of a user-friendly model, providing automotive supply chain managers with a practical tool to devise and execute action plans. These plans are founded on the validated measures developed, aiming to facilitate the enhancement of the automotive supply chain's overall performance. Consequently, this study provides numerous contributions, encompassing both theoretical and practical dimensions.

Implications of the study

The primary theoretical contribution lies in the formulation and validation of a research model designed to scrutinize the nexus between IT integration within the supply chain, information quality levels, risk management culture, inter-organizational collaboration, agility, resilience, and the performance. The findings suggest that incorporating IT into the supply chain and maintaining

high information quality within it can enhance inter-organizational integration. Notably, supply chain integration and cultivating a risk management culture emerge as pivotal factors for successful collaboration within the automotive SC in Morocco, aligning with previous research (Kang & Moon, 2016; Mofokeng & Chinomona, 2019). Moreover, our research underlines the importance of collaboration as a prerequisite for bolstering the agility and resilience of the automotive supply chain. Consequently, this study significantly contributes to elucidating the interplay among these three variables. Another theoretical advancement is the clarification of the link between collaboration, agility, resilience, and supply chain performance. The study underscores that the performance of the automotive SC hinges on inter-organizational collaboration, SC agility, and resilience.

In practical terms, the research outcomes offer substantial insights for automotive supply chain managers in Morocco. They can leverage the relationships outlined in the proposed model to enhance the performance of the automotive supply chain. Rather than being susceptible to potential disruptions arising from an unstable environment, SC leaders and managers are encouraged to implement practices that identify and address operational and strategic risks, thereby fostering a risk management culture.

Limitations and perspectives

Regarding the limitations of our study, it can be noted that our research model's development relied solely on prior research, constituting a theoretical constraint. To address this, forthcoming investigations will employ a hybrid exploratory qualitative approach to situate the research model in context and devise scales tailored to measure various constructs within the study's framework. Furthermore, adopting action research would be advantageous for thoroughly examining the connections among the research variables.

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THE ROLE OF SELF-CONFIDENCE IN MEDIATING INFLUENCERS, MATERIALISM, AND THE SOCIAL ENVIRONMENT ON ONLINE IMPULSE BUYING IN INDONESIA

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Abstract. *Impulse buying behavior will open up opportunities for business actors, where business actors have the opportunity to fulfill consumer desires by providing a wide choice of products or services and encouraging consumer impulse purchases. Business actors need to know the determinants of consumer impulse buying. This research aims to determine the determinants of online impulse buying as seen from influencers, materialism, and the social environment with self-confidence as a mediator, so that businessmen can implement appropriate business strategies to encourage consumers impulse buying behavior. The data collection technique used an online survey with the Google Forms survey platform. This data was then distributed via social media such as WhatsApp (personal and group contacts), Instagram, and X (Twitter). The questionnaire in the research was given to the entire population, and they were consumers who shop online. The data analysis used in hypothesis testing was Structural Equation Modeling (SEM) with SmartPLS. This study was successful in determining the effects of materialism, social environment, and self-confidence on online impulse buying, but it was unable to confirm the influence of influencers on online impulse buying. Data from studies revealed that self-confidence could mediate the influence of influencers and the social environment, but it failed to demonstrate the importance of self-confidence in moderating the influence of materialism on online impulse purchases.*

Keywords: *influencers, materialism, social environment, online impulse buying.*

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Introduction

Along with the advancement and growth of communication technology, the internet has now become one of the most significant things for society. The Internet as a marketing channel tends to stimulate impulsive consumer purchases (Cavazos-Arroyo & Máynez-Guaderrama, 2022). Impulse buying via internet channels varies from e-commerce to social commerce (Akram et al., 2018), and the process begins with the impulse to buy impulsively and continues until the purchase is accomplished, without regard for the negative repercussions of the action (Utama et al., 2021). According to We Are Social, 178.9 million Indonesians made online purchases of US$55.97 billion (Rp. 851 trillion) between 2022 and early 2023. According to User Interface Engineering, nearly 40% of online shopping transactions are classified as impulse purchases (Prihadi et al., 2022), while Wu et al., (2020) stated that more than 50% of online shopping is classified as impulse purchases, demonstrating the importance of studying impulse buying behavior and to further understand this behavior, considerable effort has been devoted to research (Fu et al., 2018).

The phenomenon of online impulse buying has been extensively studied in general online contexts (Sundström et al., 2019 dan Wu et al., 2020) as well as in social media commerce contexts (Abdelsalam et al., 2020; Liu et al., 2019; Setyani et al., 2019). Online impulse buying is primarily concerned with uncontrollable customer behavior when exposed to online cues from e-stores (Amos et al., 2019). The increased usage of social media is also driving online impulse purchases. According to Influencer Marketing Hub, the global sales value via social media is anticipated to be $732 billion in 2021, with an average annual growth rate of 31.54%, and is expected to reach $2.9 trillion in 2026. Since the rise of social media platforms, certain people's accounts now have the chance to get more followers, allowing the account owner to become an influencer. Influencer marketing has emerged as a critical tactic to employ (Lee et al., 2022). Because of the high degree of effectiveness and low cost of employing influencers in marketing compared to traditional marketing, it is expected that many organizations continue to expand their budgets for marketing using influencers (Gamage & Ashill, 2022).

Ease of shopping also increases interest in shopping to fulfill material needs such as appearance needs or showing social status often called materialism (Cuandra & Kelvin, 2021). Usually, individuals who adhere to extreme materialism seek dignity and social status (Doosti & Karampour, 2018). Several researchers have examined the relationship between impulse buying and materialism (Cuandra & Kelvin, 2021; Barakat, 2019; Mukhtar et al., 2021). If a materialist wants to own an item, he may buy it without thinking or considering it first and the worst is shopping for fulfilling desires.

Family, frieends, classmates, coworkers, and so on also stimulate impulsive purchasing (Pujiastuti et al., 2021). This social atmosphere serves as a guideline for where to make a purchase. A person begins their consumption activities by purchasing items that their friends wear to imitate their style and conceal their flaws to gain recognition and attention from their surroundings. Unfortunately, if qualities are set too high based on wishes rather than needs, these spending activities become excessive and lead to impulsive purchases. Self-confidence is a feeling of trust in one's abilities and judgment to complete a task. When someone has self-confidence, they are optimistic and embrace their talents to deal with anything. According to Dörnyei (2018), the concept of self-confidence is intimately tied to the concept of self-esteem. Self-confidence comes from the outside, it is frequently easier to develop than self-esteem (Jack, 2020).

Studies have investigated intrinsic characteristics that drive impulse buying, such as materialism (Cuandra & Kelvin, 2021; dan Barakat, 2019), proving that materialism leads to impulsive buying. According to Maison & Adamczyk (2020) materialistic customers are more likely to spend money than less materialistic consumers. Mukhtar et al., (2021) discovered that materialism had a strong and significantly favorable influence on impulse buying, however, because this study only included female respondents, it is not typical. Furthermore, Kim & Kim (2021) said that influencers, in conjunction with the increased usage of social media, can induce impulse purchases (Jegham & Bouzaabia, 2022). Several more research back up the claim that consumer

trust in influencers is critical for a successful marketing strategy since it drives impulse purchases (Chetioui et al., 2020; Magano et al., 2022; M. Liu, 2022).

This research aims to determine the determinants of online impulse buying as seen from influencers, materialism, and the social environment with self-confidence as a mediator, so that business people can implement appropriate business strategies to encourage consumer impulse buying behavior. This study examines consumer self-confidence as a mediator between influencers, materialism, the social environment, and impulsive buying, as no other researcher has done so. Self-confidence refers to a positive image of oneself that can be influenced by outside influences such as influencers and one's social surroundings. Low self-esteem promotes materialism (Trzcińska & Sekścińska, 2021), causing people to make hasty purchases.

Literature Review

Currently, digitalization has made social media platforms more accessible and popular, which has altered traditional marketing strategies to social media-based marketing (Rutter et al., 2021). The rise of social media platforms has allowed certain people's accounts to get more followers, allowing the account owner to become an influencer (Claesson & Starud, 2023). In sponsored posts, influencers tend to speak positively about products. Some influencers promote affordable products continuously and repeatedly causing the audience to become interested and then make impulse purchases. The more influential an influencer, the higher the online impulse buying (Sari et al., 2023).

H1. Influencers influence online impulse buying.

As globalization accelerates, materialism is an essential behavior in the humanities and social sciences; nonetheless, materialism is still infrequently articulated and poorly understood (Gamble et al., 2019). Consumers with a high social status consume things that reflect their status. Materialism influences impulse purchases, particularly among young customers seeking to strengthen and validate their self-concept (Moran & Kwak, 2017). Sen & Nayak (2019) found that the younger generation of Indian is materialistic and the consequences are seen in impulsive shopping. Research by Yi & Jai (2019) shows that consumers who are aware of the bad consequences of impulsively buying goods less likely to make impulse purchases in the future and become less materialistic.

H2. Materialism influences online impulse buying.

The social environment around a person is thought to be able to influence purchasing decisions for goods and services, both consciously and impulsively. Luan et al., (2017) explains that the influence of the social environment usually comes from the nuclear family, friends, school mates, colleagues, and etc. Fitriya (2021) believes that an individual is reliant on the correct, best, and sensible decisions and tends to emulate those in his social environment, such other parties in his social environment are regarded as decision-makers and then he does impulsive purchases.

H3. The social environment influences online impulse buying.

People sometimes engage in numerous activities to increase their self-esteem, even if the consequences are not always as intended (Firmansyah, 2020). A person's self-confidence develops when he feels valuable, and this self-confidence can be achieved through various means, including appearance. A person who lacks self-confidence make a great effort to appear excellent in the eyes of others. This is ironic because, for people with low self-confidence, appreciation from other people is an important aspect of their lives since what influences their lives is the opinion of external parties (Singh & Nayak, 2016). This condition triggers impulsive purchases from those people who have low self-confidence to gain appreciation from others so that their self-confidence are raising. Research conducted by Zheng et al., (2023) find that self-confidence and materialism mediated social network on compulsive buying. Indrawati et al., (2022) proves that self-confidence has a negative influence on impulse buying. Research by Tran (2022) provides empirical evidence that someone with low self-confidence has pressure to escape negative feelings and makes impulse purchases to increase his self-confidence. Dhandra (2020) emphasizes that low self-confidence is one of the factors that influences impulsive buying.

H4. Self-confidence influences online impulse buying.

According to Burton et al., (2019), impulsive buying occurs when a sudden, strong emotional desire occurs, caused by reactive behavior with low cognitive control. The four elements that specifically contribute to impulse buying are external stimuli, internal stimuli, situational and product-related factors, and demographic also sociocultural factors (Muruganantham & Bhakat, 2018). External stimuli are marketing indicators that marketers use to attract consumers to make purchases, while internal stimuli are aspects of a person's personality (Luo et al., 2018). Additionally, in the context of online commerce, the social environment also influences impulse purchases (Ming et al., 2021). External factors in this study are stimulation from influencers and the social environment, internal stimulation is materialism and self-confidence.

Mukhtar et al., (2021) discovered that consumer materialistic values predict impulse purchases and consumer pressure. Consumers with low self-confidence rely more on extern information gained from other people to evaluate products, such as influencers and their social surroundings. Low self-confidence and aversion to taking risks result in a person's incapacity to determine what to buy for themselves (Akram et al., 2018; Khan et al., 2018). According to Mukhtar et al., (2021) depression moderates the link between materialism and impulse buying.

H5. Self-confidence mediates the influence of influencers on online impulse buying.

H6. Self-confidence mediates the influence of materialism on online impulse buying.

H7. Self-confidence mediates the influence of the social environment on online impulse buying.

Methods

The research method applied was quantitative, that was associative to determine the correlation between two or more variables. In the context of research, we wanted to know the results of hypothesis testing regarding the influence of influencers, materialism, and the social environment on online impulse buying with self-confidence as a mediator. The participants were consumers who shopped online with a total of 250 respondents and were selected using a simple random sampling technique. Data were collected using a five-point Likert scale, varying from strongly disagree to strongly agree.

The indicators used for each variable refer to previous research. The influencer variable indicator refered to the TEARS celebrity endorser model (Shimp, 2019) which consisted of trustworthiness, expertise, attractiveness, and similarity. The materialism variable was divided into 3 indicators referring to the opinions of (Shimp, 2019) and Ahuvia & Wong (2002), namely acquisition centrality, possession defining success, and acquisition as the pursuit of happiness. The social environment variable had two indicators, namely the reference group and the family. The self-confidence variable adopted to Dash et al (1976) idea that proposed self-confidence elements were self-belief, objective, and rational. The impulse buying variable adhered to the opinion of Utami (2019) who divided impulse buying into pure impulse, reminder impulse, suggestion impulse, and planned impulse. Each research instrument was tested for validity and reliability, to ensure that the research used the right instruments to obtain data.

The data collection technique used an online survey with the Google Forms survey platform. This data was then distributed via social media such as WhatsApp (personal and group contacts), Instagram, and X (Twitter). The questionnaire in the research was given to the entire population, namely consumers who shop online. The data analysis used in hypothesis testing was Structural Equation Modeling (SEM) with SmartPLS.

Results

Pearson correlation product moment was used to test the construct validity, and Cronbach alpha for testing reliability. 30 respondents participated in validity and reliability testing, and the results indicated that all the items in the instruments were valid and reliable thus they could be used as collecting data tools.

The questionnaires that had been tested for validity and reliability were distributed to 250 respondents. The results of the questionnaires explained that women did more impulse buying at

56.4% compared to men at 43.6%. The majority of research respondents were aged between 11 and 26 years, namely, 85.6%, and the majority of respondents stated that they preferred the Shopee marketplace for shopping online transactions.

Before testing the hypothesis, the outer model was tested. The instruments were tested using the loading value, Cronbach's alpha, composite reliability, and AVE to see the value of construct validity and reliability. The results can be seen in Table 1.

Table 1
The Results of Loading Value, Cronbach's alpha, CR, and AVE

Variable/Indicator	Loading Value	Cronbach's alpha	Composite Reliability	AVE
FLU		0.909	0.927	0.615
FLU01	0.723			
FLU02	0.788			
FLU03	0.848			
FLU04	0.857			
FLU05	0.799			
FLU06	0.853			
FLU07	0.737			
FLU08	0.646			
MTR		0.854	0.892	0.580
MTR01	0.791			
MTR02	0.815			
MTR03	0.658			
MTR04	0.802			
MTR05	0.699			
MTR06	0.790			
LSS		0.767	0.822	0.611
LSS01	0.855			
LSS02	0.834			
LSS03	0.234			
LSS04	0.621			
KPD		0.819	0.867	0.523
KPD01	0.635			
KPD02	0.679			
KPD03	0.721			
KPD04	0.736			
KPD05	0.787			
KPD06				
IMB		0.786	0.862	0.610
IMB01	0.712			
IMB02	0.819			
IMB03	0.818			
IMB04	0.770			

Note: Influencers (FLU); materialism (MTR); social environment (LSS); Self-confidence (KPD); online impulse buying (IMB)

Based on the results of loading factors in convergent validity testing (Table 1), the variables influencer, materialism, self-confidence, and online impulse buying are considered to have loading factors greater than 0.5 because according to Ghozali (2021) research in the initial stages of developing the measurement scale has a loading value of 0,5 is considered sufficient. The social environmental indicator (LSS03) has a loading factor value of 0.234 so LSS03 is removed from the model. Composite reliability (CR) and Cronbach's alpha results were obtained from all indicators with a composite reliability of more than 0.70, thus showing that these indicators are reliable. Meanwhile, the average variance extracted (AVE) results were obtained from all indices that had an AVE above 0.50, which met the requirements for explaining the use of indicators.

After testing the inner model, various results emerged for each hypothesis studied. Table 2 presents the results of the influence test between variables. H2, H3, H4, H5, and H7 each have a significant influence. Meanwhile, H1 and H6 show results that have no effect. The researcher then explains each hypothesis testing result and compares it with previous research findings.

Table 1
Direct and Indirect Effects of the Variables

Hypothesis/Path	direct Effect			indirect Effect			Result
	β	t_value	ρvalue	β	t_value	ρvalue	
H_1. FLU IMB	0.000	0.001	0.999				Rejected
H_2. MTR IMB	0.337	4.865	0.000				Supported
H_3. LSS IMB	0.274	3.876	0.000				Supported
H_4. KPD IMB	0.215	2.632	0.009				Supported
H_5. FLU KPD IMB				0.074	2.730	0.007	Supported
H_6. MTR KPD IMB				0.045	1.840	0.066	Rejected
H_7. LSS KPD IMB				0.057	2.163	0.031	Supported

Note: Influencers (FLU); materialism (MTR); social environment (LSS); Self-confidence (KPD); online impulse buying (IMB)

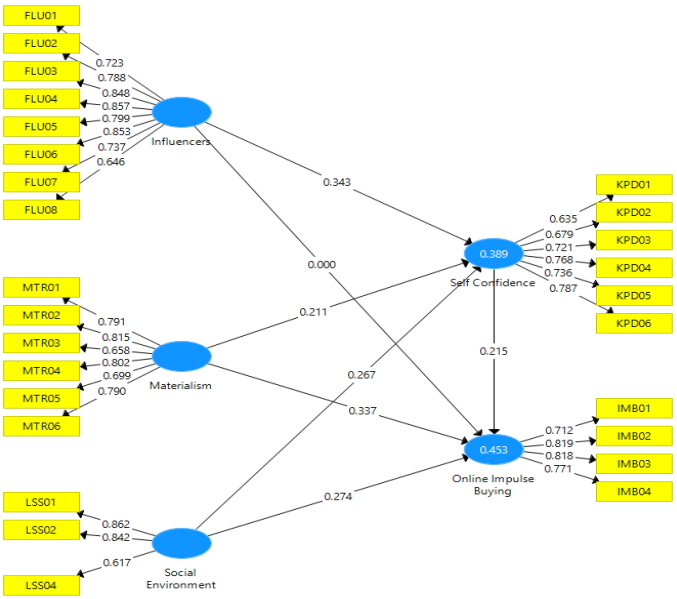

Figure 1. Research Model

Discussion

The first hypothesis tests the influence of influencers on online impulse buying. The research results indicate a coefficient value of 0.000 with a value of t = 0.001 < 1.96 with a significant value of 0.999 > 0.05, which means that H1 is rejected. It is assumed that respondents trusted influencers less when advertising products. Respondents are more careful with persuasion and recommendations from influencers so they are not encouraged to make impulse purchases online. This opinion is supported by Chetioui et al., (2020); Magano et al. (2022), and Liu (2022) who state that the perception of trust that consumers feel towards influencers can become paradoxical if the influencer starts to become less trustworthy.

Nizri, (2022) explains that Influencers are divided into nano-influencers, micro-influencers, and macro-influencers. Influencers are not only characterized by the direction they choose to promote themselves but they are divided into groups based on the number of followers and their influence. Gross & Wangenheims (2022) research states that macro-influencer followers give influencers more attention compared to micro-influencer followers, but both find that although macro-influencers have higher followers and a wider reach, the number of followers who react

against them is less. Gross & Wangenheim (2022) conclude that this is caused by individuals not feeling like they are directly targeted when they are with or in a larger group of people. Therefore, the message conveyed does not have much impact because it can be directed at anyone and the followers do not have a high sense of responsibility to react to the message. Meanwhile, micro-influencers have a high level of credibility and have higher engagement from their followers.

The second hypothesis tests the influence of materialism on online impulse buying. The research results indicate a coefficient value of 0.337 with a value of t = 4,865 > 1.96 with a significant value of 0.000 < 0.05, which means H2 was accepted. A materialist consumer thinks that material possessions are the main attribute of individual identity leading to success and are the key to happiness (Attiq & Azam, 2022). If a materialist wants to have an item to show their identity, they buy it without pondering or scrutinizing when shopping. Usually, people who adhere to extreme materialism seek dignity and social status (Doosti & Karampour, 2018). Moran & Kwak (2015) research proves that impulse buying is influenced by materialism, especially among young consumers to strengthen and confirm their self-concept. Likewise, according to Türk & Erciş (2017), Cuandra & Kelvin, (2021); Öztürk & Nart (2017); Barakat (2019), and Mukhtar et al., (2021) prove that impulse buying is influenced by materialism.

The third hypothesis tests the influence of the social environment on online impulse buying. The research results indicate a coefficient value of 0.274 with a value of t = 3,876 > 1.96 with a significant value of 0.000 < 0.05, which means H3 is accepted. The social environment around a person influences impulse purchases because of recommendations from the environment, whether through family, friends, schoolmates, colleagues, etc. This social environment becomes a reference for consumers who make purchases (Valiansyah et al., 2023). Fitriya's research (2021) states that an individual is dependent on the correct, best, and rational choices and tends to imitate those in his social environment so that other parties in his social environment are considered to be the source of decision-making and make impulsive purchases. Research by Pujiastuti et al., (2021) proves that the social environment such as family, friends, school friends, co-workers, etc also encourages impulsive purchases.

The fourth hypothesis tests the influence of self-confidence on online impulse buying. The research results indicate a coefficient value of 0.215 with a value of t = 2,632 > 1.96 with a significant value of 0.009 < 0.05, which means H4 was accepted. One of the factors that causes a person to feel valuable is self-confidence and someone who lacks self-confidence tries as hard as possible to appear good in the eyes of others. This is sometimes ironic because appreciation from other people is a crucial part of his life. After all, what influences his life is the opinion of parties external to him (Singh & Nayak, 2016) so this triggers impulsive purchases from someone to be able to get appreciation from other people and increase self-confidence. This research supports the results of the study by Dhandra, (2020); Indrawati et al., (2022) dan Tran (2022) state that impulsive shopping is a compensatory action to increase self-confidence.

The fifth hypothesis tests the influence of influencers on online impulse buying with self-confidence as a mediator. The research results indicated a coefficient value of 0.074 with a value of t = 2,730 > 1.96 with a significant value of 0.007 < 0.05, which means H5 is accepted. Chuang et al (2018), in a psychology study, find that self-confidence is a crucial component of every human mental condition and is a crucial feature examined in the customer purchasing decision-making process, and is often used to analyze consumer behavior. Self-confidence is one of the most important identity attributes, which determines how individuals react to circumstances. consumers who lack confidence rely more on external information such as an influencer to make purchasing decisions and trigger impulse purchases.

The sixth hypothesis tests the influence of materialism on online impulse buying with self-confidence as a mediator. The research results indicate a coefficient value of 0.045 with a value of t = 1,840 < 1.96 with a significant value of 0.066 > 0.05, which means that H6 is rejected. Self-confidence does not influence consumers' materialistic attitudes in making impulse purchases online. Materialism increases people's need for a product and entices them to buy excessively, most

people are impulsive, but the high or low self-confidence of a consumer is not able to encourage an attitude of materialism.

The seventh hypothesis tests the influence of the social environment on online impulse buying with self-confidence as a mediator. The research results show a coefficient value of 0.057 with a value of t = 2,163 > 1.96 with a significant value of 0.031 < 0.05, which means H7 is accepted. Self-confidence plays a crucial role in helping individuals have good interactions with other people. The better a person's relationship with their social environment, the more self-confidence they have (Haryati et al., 2021). The social environment has a big influence on the formation of self-confidence in a meaningful life as a form of a person's courage to explore everything that the individual finds interesting, including making impulse purchases.

Conclusion

This study is successful in determining the effects of materialism, social environment, and self-confidence on online impulse buying, but it is unable to confirm the influence of influencers on online impulse buying. Data from studies reveal that self-confidence mediates the influence of influencers and the social environment, but it fails to demonstrate the importance of self-confidence in moderating the influence of materialism on online impulse purchases. As a conclusion, the findings can be used to enrich information and serve as a reference for related issues such as consumer behavior, social influence, consumer psychology, and, in particular, the use of influencers to drive online impulse buying.

This study provides several implications that can be applied to business. The findings of this study help entrepreneurs and businessmen identify consumers in the process of making impulsive buying decisions based on consumer psychology, especially in terms of materialistic qualities and self-confidence that encourage consumers to buy impulsively. Companies engaging in e-commerce should emphasize the status of their products and services and focus on creative marketing communication messages in promotions or direct sales because materialism, including self-confidence, social environment, and the popularity of influencers influence impulse purchases. Entrepreneurs and businessmen who use influencers to advertise or introduce their products must be more careful in looking for influencers who are truly capable of generating impulse purchases. These findings provide managers with deeper insight into customers. Specifically, when customers feel stressed, anxious, or nervous, they tend to buy impulsively.

The limitation of this research is that this research only tests influencers, materialism, and social environment with the mediating role of self-confidence. Apart from that, this research has not focused on consumers with certain age strata because this research was conducted on respondents with various age levels. Future research should be able to compare the millennial generation and Generation Z in impulse buying behavior.

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