Montenegrin Journal of Economics

INDEXING

C O N T E N T S

6

Montenegrin Journal of Economics

ELIT
Economic Laboratory Transition
Research Podgorica

Identity, Human Capital and Poverty Reduction Effects: An empirical study based on China Family Panel Studies

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ARTICLE INFO

ABSTRACT

Poverty is a common problem worldwide, and governments have been committed to poverty reduction. This study empirically examines the effect of identity on income poverty and multidimensional poverty in rural households. The findings show that identity has a significant negative impact on income and multidimensional poverty, in other words, identity has a significant pro-poor effect on rural households. Based on the 2016 and 2018 Chinese Family Tracking Survey (CFPS) data, the relationship between identity and the poverty-benefiting effect was empirically analyzed. The results show that identity has a significant pro-poor effect, and the results remain significant after adding control variables. The results remain robust after changing the measurement method and the explanatory variables. Heterogeneity analysis showed that the household head's age, gender, education level, and regional factors also influenced the poverty-beneficial effect of identity. The above findings suggest that ensuring the farmers' main status, building a homogeneous identity, and giving full play to its poverty-benefiting effects can better consolidate the results of poverty eradication and promote the overall revitalization of the countryside. At the same time, it is urgent to build a high-quality platform for migrant workers to return to their hometowns for employment and entrepreneurship, focusing on the cultivation of new skills of rural residents, improving their labor productivity, and providing a continuous supply of high-quality human capital for rural revitalization. Examining the effect of identity on poverty and income generation can provide theoretical support and policy suggestions for promoting the equalization of identity between rural and urban residents.

INTRODUCTION

On November 23, 2020, after nine counties in Guizhou province withdrew from the sequence of poor regions, 832 impoverished counties in China were completely removed from poverty list, the national goal of poverty eradication was completed, and the problem of absolute poverty was completely solved in China. It should be noted that eliminating absolute poverty does not mean that the cause of poverty reduction is eradicated. The vulnerability of poverty determines that the people who have just crossed the poverty line and got out of poverty still may return to this state. Therefore, stopping the return to poverty and improving the quality of poverty eradication is related to the consolidation of the results of poverty eradication and the smooth promotion of the rural revitalization strategy. This is determined by the participating subjects in the rural revitalization and the problems existing in the current study. First, most farmers should become the main force of rural revitalization (Zuhui, 2018). The basic premise and condition of rural revitalization are to take farmers as the main body and let them build their good life by themselves (Xuefeng, 2019). Secondly, the sense of integration of individuals into the group and society, the identity transformation and identity after integration are crucial, which determines the behavior and ability of these individuals to engage in various productive activities. Therefore, inequality in identity can largely lead to a lack of endogenous motivation among farmers (Bin & Guisheng, 2019). Having a sense of group belonging and enjoying basic civil rights for poor groups is a top priority for poverty governance and escaping poverty. The absence of rights, while causing marginalization of individual status, increases the likelihood that they will become poor or return to poverty (Basu, 2013). Finally, because of the high consistency of agricultural workers' identity (Shujuan & Xianxiang, 2016), promoting the transformation of farmers' identity is an inevitable development trend of rural agricultural modernization and an important part of solving the "three rural problems" in China. In the longer term, the construction of a long-term mechanism to stop the return to poverty and solve relative poverty should focus on the people's main status, identity transformation, and benefit-sharing. Therefore, examining the effect of identity on poverty and income generation can provide theoretical support and policy suggestions for promoting the equalization of identity between rural and urban residents.

The marginal contributions of this study are mainly in the following aspects: firstly, for the first time, we analyze the poverty-beneficial effect of identity from the perspective of identity, construct an identity index for empirical testing, and provide a systematic explanation of the impact mechanism. Secondly, considering the characteristics of multidimensional poverty of transition poor groups and potential poor groups, this study compares the poverty level measured by multidimensional poverty criteria with the income poverty level. Third, this study empirically tests the poverty-beneficial effect of identity using the China Family Tracking Survey (CFPS) data and conducts a more detailed analysis at the micro-level, providing empirical evidence for achieving identity parity and realizing rural revitalization.

The structure of this study is arranged in the following manner: the second part is the relevant literature analysis and review; the third part is the relevant research design content, including sample data, indicator design, econometric model design, and descriptive statistics of various variables; the fourth part is the empirical study, including robustness analysis, heterogeneity discussion and relevant tests of influence mechanisms; the fifth part contains the main conclusions of this study with related policy recommendations.

1. LITERATURE REVIEW

Poverty is a common problem worldwide, and governments have been committed to poverty reduction. Regarding the definition of poverty, the World Bank gave a systematic interpretation in the World Development Report 2000-2001: poverty is both a phenomenon of low income and low consumption and a disadvantage faced in other areas of the human development process such as health care, education, political and social status, safety and security, which cause the poor groups to suffer from dignity, self-confidence, self-esteem, and power (Sulan & Yan, 2001). This implies that poverty is a multidimensional phenomenon, which provides scholars with new perspectives to study poverty and poverty reduction. For example, Yuan, Guanghua and Qinghua (2013) point out that chronic poverty is an important symptom of the poverty

phenomenon. Therefore, the government and society must provide relevant support to the poor groups regarding medical care, education, and technological capabilities.

Similarly, Wei Zou and Yingfeng Fang (2012) argue that "capacity development" is an effective way to reduce the vulnerability and chronicity of poverty. Guanghua, Fei & Yuan (2014) found that increasing the level of assets can significantly reduce poverty vulnerability. Therefore, the accumulation of assets of poor groups should be promoted, and their efficiency should be improved to reduce poverty and poverty vulnerability. If education, health care, and retirement are included in the category of individual assets, they can produce significant welfare effects (Liu, Chang, & Shaojun, 2015). However, if the minimum living security only exert poverty reduction effects in the current period, they cannot achieve poverty vulnerability reduction in the long run (Xu & Li, 2017).

Meanwhile, the importance of industrial poverty alleviation is gradually highlighted. On the one hand, industrial poverty alleviation can significantly reduce poverty vulnerability; on the other hand, industrial poverty alleviation has played an important role in China's poverty reduction practice and entrepreneurial poverty reduction. With the deepening of poverty eradication, some deep poverty groups experiencing difficulties in getting out of poverty, the question of stimulating their endogenous motivation for poverty eradication from a multidimensional poverty perspective has become a hot spot of academic concern. The state and government have repeatedly mentioned that guaranteeing farmers' main status and ensuring the rights of farmers' group development, identity, and subject status belong to the same category; this issue has also become a new hot spot for scholars to study the poverty issue.

Identity is an important dimension in understanding poverty, poverty governance, and measuring organizational behavior. Early studies of identity took a philosophical, theoretical paradigm. Later in the period, the powerful explanatory power of identity theory led to its widespread use in sociology, psychology, economics, and management. Applications in economics include pioneering studies by Kerlof and Kranton (2000), Sen (1985), and Basu (2013), among others. For example, Sen's (1985) research suggests that the famine people face does not necessarily stem from a lack of food but rather from the fact that the poor do not have access to this food. Basu (2013) argues that a person's identity within a group and sense of inclusion in society are so important that they determine the person's ability to engage in productive activities. This means that if a poor person perceives his/her position as a marginalized one, he/she will tend to give up.

Status is closely related to group level in the group effect, and group level is an important factor affecting the living standard of individuals and regional poverty status (Zou & Fang, 2012). Y. Fang & S. Qinghua (2013) distinguished between income-based inequality and ability-based inequality when examining the welfare of migrant workers. They concluded that income inequality has a significant negative impact on the welfare of those migrant workers with low ability and low income. Therefore, even though there is no difference in income levels, significant differences in identity and other aspects between urban migrant farmers and urban residents create a de facto inequality between them (Chen & Zhang, 2015). The higher the level of urban identity of migrant workers, the higher their willingness to stay in the city (Wang & Li, 2021). The study of Wan Haiyuan and Li Shi (2013) showed that the individual discrimination caused by the household registration system in China has a significant negative impact on the urban-rural income gap.

Meanwhile, different household registration statuses harm residents' subjective well-being (Li & Zhu, 2014), which may be reflected in differences in education level, age, household registration, and occupational status (Hongmei, 2016; Shi, Fang, & Gao, 2021). This identity inequality is an important causal factor of an imperfect labor market system. It leads to a general dilemma in their occupational identity, forming an "involutional" character with no endogenous motivation and occupational slackness. Further, an imperfect labor market system leads to inefficient labor allocation. As a result, it widens the income gap, which needs to be corrected by improving labor allocation and creating a fairer and more reasonable income distribution system (Li & Zhu, 2018). In a study on a poverty reduction model of participatory community-based integrated development, Junping, Aizhao, & Song (2017) examined poverty alleviation and income distribution effects. It was concluded that such a poverty reduction model is highly sustainable. However, there are significant differences in the effects on farmers' participation in various productive activities, both at the "group" and "period" levels. At the same time, the key variable of effort does not play an

important role in constructing individual social status. The role of the government is to provide the necessary platform and channels for the disadvantaged groups to change their fate and gradually improve the existing redistribution system.

In contrast, while examining poverty alleviation projects in the western region, Ma Liangchan and Ha Hongying (2017) found that certain constraints on the power of basic poverty alleviation cadres, an insufficient supply of social forces, and the loss of subjective rights and the status of the poor are important reasons for the structural dilemma of poverty alleviation projects. Macro-level studies on income inequality and economic growth, among others, can also help us understand the important link between identity and poverty. For example, Gong, Li, & Lei (2017) show that inequality of opportunity, and inequality of effort have a significant positive effect on economic growth. This means that if poor people cannot get rid of the "identity label of poverty", inequality of opportunity is inevitable, which fails to improve the living standard of poor people and does not contribute to the quality economic growth of a country.

Identity parity helps improve the effectiveness of one's behavior and develop common values of life. Thus, the assimilation and equalization of the identity of rural and urban residents, the enhancement of the identity status of rural residents, and the strengthening of their subject status have a positive contribution to solving the poverty problem. They also play an important role in comprehensively promoting the process of rural revitalization, agricultural and rural modernization, and urban-rural integration development. Therefore, analyzing the relationship between identity and rural poverty provide better understanding of the importance of rural residents' subject status, identity equalization, equal development between urban and rural areas, and put forward valuable policy suggestions in a targeted manner.

2. RESEARCH METHOD

2.1 Data selection

This study mainly uses data from the China Family Tracking Survey (CFPS) in 2016 and 2018 for the main regression analysis. The CFPS database reflects the basic conditions of rural households and individuals comprehensively. Therefore, the sample data provided by the database can effectively measure the status of identity according to the relevant research variables used in the literature. Based on the sample of matched households, the study first eliminated the missing and abnormal data in data processing and finally obtained the sample size of 4487 households per year. This study also performed maximum and minimum normalization for each type of indicator to eliminate the effects of differences in the indicator outline and range of values. In addition, this study also tailored various continuous variables to change the extreme values that fall outside the 1% and 99% quartiles.

2.2 Econometric model design

The following core econometric model was used for this study to investigate the poverty-beneficial effects of identity:

$$y_{it} = \beta_{10} + \beta_{11}Identity_{it} + \beta_{12}X_{it} + \sigma_{it} \qquad (1)$$

This model represents the poverty index of rural household i in year t, including the income poverty index, multidimensional poverty index, and poverty status of rural household i in year t under different poverty criteria. In addition, it represents the identity index of rural household i in year t. It shows controls for relevant factors that may affect the poverty status of the household. The household level includes the identity characteristics of the household head (gender, age, marital status, etc.) and the household size, the level of the social network, etc. The regional level refers to the geographical location of rural households divided into three regions: eastern, central, and western (the provinces where they are located are divided according to different geographical locations and the level of the economic and social development status of different regions). It also represents the random error term.

2.3 Variable selection

2.3.1 Explanatory variables (income and multidimensional poverty index)

While income poverty still plays a fundamental role in poverty identification, more and more scholars in recent years have shifted the perspective of poverty to multidimensional poverty, which more accurately describes the nature of poverty (Jiazhi & Sifang, 2017). The multidimensional poverty index (MPI), also known as the A-F poverty index, was proposed by Alkire and Foster (2011). The MPI can reflect the differences and extent of poverty at the individual or household level in different dimensions (Zhang, Yang, & Yuan, 2017). Therefore, this study chose to use both income poverty criteria and multidimensional poverty criteria as the poverty identification criteria.

Regarding income poverty, the absolute poverty criterion selected for this study is derived from the relevant definition of the national poverty line standard, i.e., the per capita net income of rural households. This indicator was adjusted to 3146 yuan per capita in 2016 and 3535 yuan per capita in 2018 according to this poverty line standard in constant 2010 prices (2300 yuan). Multidimensional poverty refers to the setting of multidimensional poverty dimensions and indicators by Yang Yanlin and Fu Chenyu (2019), combined with the CFPS data. This study finally selected six indicators from four dimensions of education level, health level, income level, and living conditions to measure multidimensional poverty. The model and method of measuring multidimensional poverty set by Alkire-Foster were adopted, i.e., more stringent deprivation indicators were used in terms of deprivation thresholds, and the weights were set using the equal-weighting method. According to Shen (2018), the second critical value, k=1/3, was selected. A household was considered multidimensional poverty (multipov) when the total score of deprivation indicators multiplied by weights was equal to or more than 1/3. The meaning of specific indicators is shown in Table 1.

Table 1. Dimensions, indicators, deprivation thresholds, and weights of multidimensional poverty

Dimension	Indicator	Threshold values and assignments	Value weight
Education	Degree of Education	Family members with an education level less than junior high school are considered as educational poverty and are assigned 1	1/4
Health	Self-reported health	If the self-rated health is "poor", it is considered healthy poverty and is assigned a value of 1	1/8
	Medical insurance	If you have a family member who does not have any health insurance, you give it 1	1/8
Income	Income	Per capita annual income below the poverty line of 2,300 yuan (2010 Price), considered as income poverty, and assigned a value of 1	1/4
The standard of living	Drinking water source	Household drinking water is a natural source of water (pond water, well water, etc.), assigned a value of 1	1/8
	The fuel of life	The cooking fuel is mainly non-clean energy such as firewood, which is assigned a value of 1	1/8

2.3.2 Explanatory variables

2.3.2.1 Identity index

This study examines the issue of identity by referring to the majority of scholars' hierarchical measures (the composite social status scores of the five levels according to the questionnaire in the CFPS database, i.e., the level in which the respondents chose themselves or their families). In addition, other variables were introduced to construct the identity index further to carve out the impact of shifts in identity status. The study of identity influences focused on variables such as income, and human capital elements (literacy, occupation), where occupation was measured by the SIOPS of occupational prestige, the Standard

International Occupational Prestige Scale. The prestige dimension of the economic status measure indicates the level of prestige represented by different occupational categories in the society. Considering the asset factor has a greater impact on identity than income on identity, the choice of the asset factor instead of income is justified. Given the feasibility of the study and the availability of data, this study constructs the identity index with the following indicators. It measures them using the entropy method (the meanings of the specific indicators are shown in Table 2).

Table 2. Construction of identity indicators

Dimension	Indicator	Meanings
EconomicFactors	Assets	Mainly refers to self-use assets, i.e., the value of Consumer durables and the value of the property (¥)
Human capital	Occupation	SIOPS score based on career prestige
	Education level	The values are assigned to 0-7 depending on the education level.
Psychological factors	Social Status	According to the CFPS questionnaire - what is your status? Scoring 1-5
	Income class	According to the CFPS questionnaire - What is your incom in your local area? Score 1-5

2.3.2.2 Control variables

In this study, personal characteristics such as age, gender (1 for men and 0 for women), and marital status (1 for married status and 0 for non-married status such as unmarried, cohabiting, divorced, and widowed) of the household head and household characteristics such as social network (communication expenses and the proportion of income accounted for by favor expenses) and household size were selected as control variables. In addition, this study introduces three dummy variables for eastern, central, and western regions to control regional differences in poverty. Eastern region includes: Beijing, Tianjin, Hebei, Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, and Guangdong. The central region includes Shanxi, Jilin, Heilongjiang, Anhui, Jiangxi, Henan, Hubei, and Hunan. The western region includes Guangxi, Chongqing, Sichuan, Guizhou, Yunnan, Shaanxi, and Gansu..

The descriptive statistics of the main variables in this study are shown in Table 3.

Table 3. Descriptive statistics of main variables

Variable	Variable Description	Observations	Average value	Standard deviation	Min	Max
incpov	Income poverty status (poverty is 1, otherwise 0)	9394	0.132	0.338	0	1
multipov	Multidimensional poverty status (poverty is 1, otherwise 0)	9394	0.727	0.446	0	1
finpovn	Inverse index of per capita net income represents the income poverty index	9394	0.165	0.164	0	1
MPI	Rural Family Multidimensional Poverty Composite	9394	0.306	0.137	0	0.742
identity	Rural family identity index	9394	0.148	0.104	0	0.919
family size	Family size	9394	3.961	1.918	1	10
age	Household head's age	9394	54.048	12.770	24	81
gender	Household head's gender (male 1, female 0)	9394	0.560	0.496	0	1
marriage	Household head's marital status (1 in marriage, 0 in other states)	9394	0.861	0.346	0	1
socnet	Social Network (based on CFPS Questionnaire -- Favorite Spending)	9394	0.043	0.068	0	1
party	Party political status (if a member is 1, otherwise 0)	9394	0.080	0.272	0	1

3. DATA ANALYSIS

First, this section analyzes the baseline regression results to explore the poverty-beneficial effects of identity. Secondly, it conducts robustness tests by replacing the regression model and variables. Thirdly, it conducts fixed-effects regression to discuss the endogeneity issue. And finally, it conducts heterogeneity analysis to separate the micro mechanisms of the poverty-beneficial effects of identity. This study first uses ordinary least squares (OLS) regression to test the effect of the identity index on income poverty and multidimensional poverty.

3.1 Baseline regression

The baseline regression results are shown in Table 4, which examines the relationship between the identity index and income poverty and multidimensional poverty, respectively.

Table 4. Baseline regression results

	finpovn	finpovn	MPI	MPI
	（1）	（2）	（3）	（4）
Identity	-0.1471***	-0.1348***	-0.1139***	-0.1067***
	（0.0225）	（0.0205）	（0.0170）	（0.0153）
age		0.0024***		0.0021***
		（0.0002）		（0.0001）
gender		-0.0098*		-0.0223***
		（0.0044）		（0.0035）
marriage		-0.0076		-0.0155***
		（0.0068）		（0.0050）
party		-0.0420***		-0.0557***
		（0.0087）		（0.0070）
socnet		-0.4400***		-0.1843***
		（0.0325）		（0.0216）
familysize		0.0128***		0.0004
		（0.0011）		（0.0009）
east		0.1096*		0.0069
		（0.0632）		（0.0259）
mid		0.1290**		0.0102
		（0.0631）		（0.0259）
west		0.1592**		0.0367
		（0.0631）		（0.0258）
Constant term	0.8394***	0.5555***	0.3230***	0.2276***
	（0.0034）	（0.0641）	（0.0030）	（0.0272）
N	9394	9394	9394	9394
R²	0.0076	0.0965	0.0075	0.0825

Note: Figures in parentheses are robust standard errors, ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. The control variables in the table include the household head's age, marital status, political affiliation party, and household social network.

The coefficients in models (1) and (3) are negative and significant at the 1% level, indicating that the identity index has a significant negative impact on income poverty and multidimensional poverty, i.e., identity has a significant pro-poor effect on rural households. The coefficients of the identity index in models (2) and (4) are still significantly negative after adding the control variables of household head characteristics and household characteristics, indicating that the household head's gender, marital status, political affiliation, and family social network have significant negative effects on income poverty (finpovn) and multidimensional poverty (MPI). The regression results are actually consistent with the expectation of this study that male household head, marital status, party membership, and a higher level of the social network

13

are characteristics that do not make households vulnerable to poverty. Meanwhile, household size significantly affects the poverty level, indicating that larger household size is more likely to deepen household poverty, consistent with the actual situation.

3.2 Robustness tests

In this study, two methods, replacing the model and replacing the explanatory variables, are selected to test the robustness of the empirical results. First, the two-way fixed effects model is selected for re-estimation, and the regression results are shown in Table 5. The findings show that the identity index is still significantly negative at 1%. Specifically, the effect of the identity index on income poverty is somewhat larger than that of multidimensional poverty because higher income can intuitively solve the problem of absolute poverty. In addition, poor groups are more likely to get rid of the poverty label and thus improve their self-identity, while multidimensional poverty contains more complex dimensions and more influencing factors. Therefore, the effect of identity on multidimensional poverty is relatively smaller. Secondly, to further verify the robustness of the regression results, the explanatory variables were replaced with income poverty *incpov* (poverty is 1, otherwise 0). Multidimensional poverty *multipov* (poverty is 1, otherwise 0) and the *Probit* model were selected for the regression. Both *incpov* and *multipov* have a significant poverty-benefiting effect. Moreover, the results remain significant after the inclusion of control variables. Thus, the regression results after replacing the variables also further validate that the baseline regression results of this study are robust.

Table 5. Robustness test results (replacement regression model)

	finpovn	*finpovn*	*MPI*	*MPI*
	(1)	(2)	(3)	(4)
Identity	-0.0335***	-0.0343***	-0.0032***	-0.0029***
	(0.0154)	(0.0153)	(0.0125)	(0.0125)
Constant term	0.8164***	0.7875***	0.3179***	0.3088***
	(0.0025)	(0.0127)	(0.0019)	(0.0088)
Control variables	No	Yes	No	Yes
N	9394	9394	9394	9394

3.3 Discussion of endogeneity issues

Considering the problem of endogeneity bias caused by omitted variables, this study controls for as many factors affecting rural household income as possible (e.g., the household head's age, marital status, level of the household social network, etc.). However, there are still some unmeasured omitted variables. This study conducted a regression analysis using a fixed-effects model to alleviate some of the endogeneity bias. The results obtained confirm that the findings are still robust (Table 6). The regression results indicate that the previous findings still hold. The identity index has a significant negative effect on income and multidimensional poverty.

Table 6. Fixed effects regression results

	finpovn	*finpovn*	*MPI*	*MPI*
	(1)	(2)	(3)	(4)
Identity	-0.1153***	-0.1084***	-0.1205***	-0.1143***
	(0.0202)	(0.0193)	(0.0190)	(0.0171)
Constant term	-0.1445***	-0.2520***	0.3246***	0.2648***
	(0.0032)	(0.0113)	(0.0031)	(0.0093)
Control variables	No	Yes	No	Yes
N	8268	8268	8268	8268

3.4 Heterogeneity analysis

The above empirical evidence and analysis show that identity has a significant poverty-benefiting effect. However, considering the differences in the poverty-beneficial effects of identity among different groups, this study conducted heterogeneity analysis through four factors: region, household head's age, gender, and education level. The results are shown in Table 7.

Table 7. Heterogeneity regression results

		finpovn		MPI		Control variables	Sample size
		Identity	Constant term	Identity	Constant term		
(1)	east	-0.1773*** (0.0378)	-0.3826*** (0.0285)	-0.1188*** (0.0281)	0.2148*** (0.0197)	Yes	3132
(2)	mid	-0.0703*** (0.0293)	-0.3078*** (0.0222)	-0.0997*** (0.0268)	0.2403*** (0.0189)	Yes	2806
(3)	west	-0.0826*** (0.0315)	-0.2047*** (0.0170)	-0.0967*** (0.0247)	0.2693*** (0.0157)	Yes	3456
(4)	age 〈54	-0.1874*** (0.0324)	-0.2265*** (0.0136)	-0.1806*** (0.0252)	0.3260*** (0.0103)	Yes	4626
(5)	Age〉54	-0.0603*** (0.0245)	-0.1183*** (0.0080)	-0.0543*** (0.0197)	0.3965*** (0.0075)	Yes	4482
(6)	male	-0.1271*** (0.0274)	-0.2832*** (0.0168)	-0.1404*** (0.0251)	0.2572*** (0.0137)	Yes	5258
(7)	female	-0.0978*** (0.0274)	-0.2699*** (0.0206)	-0.0765*** (0.0193)	0.2218*** (0.0167)	Yes	4136
(8)	Low level of education	-0.0716*** (0.0276)	-0.1996*** (0.0186)	-0.0563*** (0.0199)	0.3120*** (0.0159)	Yes	3456
(9)	High level of education	-0.1455*** (0.0282)	-0.3085*** (0.0170)	-0.1456*** (0.0228)	0.2457*** (0.0130)	Yes	5938

According to the geographical division above, this study examined the poverty-beneficial effects of identity in the eastern, central, and western regions, respectively. The results did not show significant differences. Specifically, in terms of income poverty, the coefficients of the identity index in the eastern, central, and western regions are -0.1773, -0.0703, and -0.0826, which indicates that the poverty-beneficial effect of identity on income poverty is more obvious in the eastern region because it is relatively economically developed. The income increase of the rural group is larger after the identity increase, and thus the poverty benefit effect is more obvious. In terms of multidimensional poverty, the coefficients of -0.1188, -0.0997, and -0.0967 in the eastern, central, and western regions, respectively, suggest that the beneficial effect of identity on multidimensional poverty is also more pronounced in the east. A plausible explanation is that compared to other regions, the eastern region has less poverty and significantly better infrastructure and social public services, i.e., when examined using multidimensional poverty, the pro-poor effect of identity is also better in the eastern region.

The age of the household head also affects the poverty-beneficial effect of identity to some extent. In this study, regressions were conducted using subsamples above the median (54 years) and below the median to examine the effect of the household head's age on the poverty-beneficial effect of identity. In terms of income poverty, the coefficients of -0.1874 and -0.0603 for the age <54 and age >54 groups indicate that the poverty-beneficial effect of identity on the age <54 group is somewhat more pronounced because the age <54 group has a stronger endogenous motivation to escape poverty. It is more efficient in empowering themselves through learning and identity because this age group is more motivated to escape from poverty and more efficient in empowering themselves through learning. Their identity improves more quickly so that the beneficial effect of identity is relatively obvious. Regarding

multidimensional poverty, the coefficients for the age <54 and age >54 groups are -0.1806 and -0.0543, respectively, and the above explanation for the income poverty results still holds for multidimensional poverty. In addition, another reasonable explanation is that the age >54 group has a serious identity entrenchment due to its older age, which is more evident when multidimensional poverty is used to examine its poverty level. Therefore, regardless of the perspective, the poverty-benefiting effect of identity is more pronounced in the age <54 group.

Gender also affects identity. In terms of income poverty, the coefficients are -0.1271 and -0.0978 for male and female heads of households. However, in terms of multidimensional poverty, the coefficients are -0.1404 and -0.0765 for male and female heads of households. In terms of income poverty and multidimensional poverty, the effect of household poverty benefit is more pronounced for male heads of households with the same identity index. This may be because male heads of households have easier access to skills due to their better position in social production and labor division than female heads of households. Thus, this household characteristic of male heads of households makes the poverty-beneficial effect of identity more pronounced.

Educational attainment is an important factor affecting people's cognitive ability and decision-making level. This study uses regressions on subsamples above the median (1.949) and below the median to test whether there is a difference in the effect of higher or lower education levels on the poverty-beneficial effect of identity. In terms of income poverty, the coefficients for the two groups with lower and higher levels of education were -0.0716 and -0.1455. In terms of multidimensional poverty, the coefficients for the two groups with lower and higher levels of education were -0.0563 and -0.1456. It can be seen that the poverty benefit effect is more pronounced for households with a higher education level of the household head, both in terms of income poverty and multidimensional poverty. Thus, the higher the level of education, the higher the level of identity, and the higher the level of cognition, skills, and self-development; hence, the higher the poverty-benefiting effect.

3.5 Moderating effect of human capital level

In this study, human capital is used as a research variable with moderating effect, and education is used as a proxy variable for human capital. The moderating effect model is set up as follows"

$$y_{it} = \beta_{20} + \beta_{21}Identity_{it} + \beta_{22}edu_{it} + \beta_{23}Identity_{it} * edu_{it} + \beta_{24}X_{it} + \mu_{it} \quad （2）$$

The regression results (Table 8) show that the regression coefficient of the interaction term is significant in model (1), which examines income poverty. However, in model (2), which examines multidimensional poverty, the regression coefficient of the interaction term is not significant. This implies that the level of human capital has a moderating effect between identity and income poverty, i.e., when examining income poverty, the level of human capital has a positive moderating effect on the poverty-beneficial effect of identity, and the higher the level of identity, the stronger the moderating effect.

With the implementation of precise poverty alleviation policies, rural infrastructure has been improved, and embedded industrial poverty alleviation has brought a large number of jobs. Rural laborers with higher human capital levels can fill the jobs and earn corresponding income, so the positive moderating effect of human capital level on the poverty-beneficial effect of identity is obvious when viewed only from the perspective of income poverty. However, the human capital level does not address all dimensions of measuring multidimensional poverty due to its complexity. Thus, the moderating effect of the human capital level on the pro-poor effect of identity is not significant.

Table 8. Moderating effect of human capital level

	finpovn	MPI
	(1)	(2)
Identity	-0.0736***	-0.0941***
	(0.0196)	(0.0159)
edu	-0.0084***	-0.0170***
	(0.0016)	(0.0013)
edu* Identity	-0.0183**	-0.0059
	(0.0074)	(0.0060)
Constant term	0.1204***	0.3883***
	(0.0059)	(0.0048)
Control variables	Yes	Yes
N	9394	9394

CONCLUSIONS AND RECOMMENDATIONS

Based on data from the China Family Tracking Survey (CFPS), this study empirically examines the effect of identity on income poverty and multidimensional poverty in rural households. The findings show that identity has a significant negative impact on income and multidimensional poverty, i.e., identity has a significant pro-poor effect on rural households. This basic finding still holds after robustness tests and mitigation of endogeneity bias. In addition, heterogeneity analysis shows that differences in factors such as the area where the household is located, the age and gender of the household head, and the education level also have a certain influence on the poverty-beneficial effect of identity.

Based on the above findings, this study proposes the following policy recommendations.

First, it is necessary to ensure the main status of farmers, build a model of democratic governance at the grassroots level, and promote the reconstruction of farmers' identity, so that the identity of "farmers" can be transformed into "residents" and "new professional farmers". The ultimate goal is to equalize the identities of rural and urban areas.

Second, we should coordinate the balanced development of the east, middle and west, improve the carrying capacity of economic development in rural areas, eliminate the gap between urban and rural areas, and promote the equalization of public services. We should continuously improve financial, fiscal, land use, and social security policies suitable for rural industries and promote the integrated development of one, two, and three industries. We should also build a quality platform targeting migrant workers returning to their hometowns for employment and entrepreneurship so that they can be embedded in a variety of new business entities and truly share the benefits of value-added industrial chains.

Third, it is required to strengthen education and vocational skills training for rural residents. Since implementing the precise poverty eradication policy, a large labor gap for new skills has formed in rural areas. New skills are embodied in agricultural business management, cooperative leaders, eco-agriculture, new technologies, and new business models. However, many rural residents cannot transform into new professional farmers due to the lack of new skills, their identity transformation and restructuring have not been fundamentally realized, preventing them from enjoying the dividends brought by rural agricultural modernization. Therefore, it is necessary to focus on cultivating new skills for rural residents, improving their labor productivity, supporting rural entrepreneurs with professional quality among rural residents, and providing a continuous supply of high-quality human capital for rural revitalization.

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Geopolitical Risks, Returns, and Volatility in the MENA Financial Markets: Evidence from GARCH and EGARCH Models

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ARTICLE INFO

ABSTRACT

This paper aims to examine the effect of geopolitical risks on the daily returns and volatilities of the MENA indices over the period 2016-2022. This study investigates the returns and volatilities in the MENA indices covering two important geopolitical events: the first period includes the repercussions of the Arab Spring and tensions in the Gulf region starting from 3 January, 2016 to 30 December, 2019, while the second period relates to the current geopolitical risks of the war between Russia and Ukraine from 24 February, 2022 to 15 June, 2022. Two models were employed in the analysis, GARCH and EGARCH. Based on the GARCH model, geopolitical risks have no negatively and statistically significant effect on the daily returns of stock markets in the MENA region, except for Iraqi, Omani and Egyptian indices. The results also reveal that the volatilities of the MENA indices is statistically significant during the full sample period and geopolitical risk resulted from the repercussions of the Arab Spring and tensions in the Gulf region. For the period of the Russian-Ukrainian war and based on the EGARCH model, Geopolitical risk has a negative and statistically significant effect on the daily volatility for Bahraini, Tunisian, Moroccan, Qatari and Dubai indices. The results provide strong evidence of leverage effect for the Kuwaiti and Moroccan indices. This paper provides an important insight for the government as decision makers and for investors as traders in the MENA region to realize the various risks.

INTRODUCTION

Recently, the impact of geopolitical risks (GPR) on the returns and volatilities of financial markets has drawn the interest of many policymakers, researchers, and market participants. The term geopolitical risks, according to Caldara and Iacoviello, (2022, p. 2) refers to "the risk associated with wars, terrorist acts, and tensions between states that affect the normal and peaceful course of international relations". Geopolitical tensions and threats have a significant effect on local and global economies, causing higher uncertainties

and financial market instability (Campbell et. al., 2012). In a Gallup survey conducted in 2017, 75% of investors who participated in this survey were concerned about how global military and political conflicts will affect their investments. More importantly, those investors prioritized geopolitical threats over political and economic instability (Caldara and Iacoviello, 2022). In addition, GPR is documented in several studies as a key determinant of investment decisions for investors, firms as well as government (Jin Pyo, 2021).

The adverse effect of GPR on financial markets has become significantly higher nowadays, particularly because of the rapid growth of information technology where all the financial market transactions have become faster and easier, as well as the sensitivity of stock prices has also extremely increased (Yang et.al 2021). Negative GPR can impact the stock market in many different ways. Higher GPR increases uncertainty which results in delaying market players' decision-making, increasing the risk of investment. Moreover, higher tensions and shocks might adversely affect both the demand and supply channels causing higher costs for the companies (Bloom, 2009; Fernandez-Villaverde et. al 2015). However, despite the significance of the subject, the empirical evidence is quite scant and excessively ambiguous. Even the limited research papers conducted report inconsistent findings on how GPR might affect financial market returns and volatilities. For example, some papers demonstrate that GPR negatively affects financial markets (Jin Pyo, 2021; Fossung et.al, 2021; Caldara & Iacoviello, 2022). Others claim that the relationship depends on the levels of stock market development, volatility regimes, and macroeconomic factors (Hoque & Zaidi, 2020). While other conducted studies reveal no effects of geopolitical threats on financial markets (Apergis et al., 2018; Bouras et al., 2019). These mixed results serve as a motivation for the current study.

In the Middle East and North Africa (MENA) region, this topic might gain more importance. This region has experienced numerous geopolitical shocks including wars and political conflicts (such as the Gulf War (1990–1991), the Iraq War (2003–2011), the Arab Spring (2010–2012), the Syrian Civil War (which began in 2011), tensions in the Gulf region, especially between Saudi Arabia and Qatar (2016-2020), reaching to the current conflict between Russia and Ukraine, as a part of the world. This region also has witnessed several terrorist activities over the last decade. Thus studying the effect of GPR in such a region, that is rich in such negative shocks, might offer a clear picture of the effect of these events on the returns and volatilities of MENA markets. Further, the selection of the MENA markets, as a sample, might consider an important contribution for the current study.

First of all, most of prior studies consider one country in the analysis, while including cross-countries studies might enhance the credibility and generalizability of the findings. Second, when it comes to the MENA countries, usually they share similar economic structures, have rapid population growth, have underdeveloped financial markets, and have political systems that are frequently operate differently from those of developed countries (Elsayed and Helmi, 2021). These characteristics might lead to different findings that were reported from developed economies. Last but not least, with exception to Elsayed and Helmi, (2021), the lack of studies that tackle the GPR in such region is apparent in the literature and the need for more research is a priority. Even the study of Elsayed and Helmi (2021) does not include the effect of recent GPR i.e. the Russian- Ukrainian conflict, their study just stops at the year 2018. The current study, however, yields up-to-date, covering the period from 2016 to 2022.

The main objective of the current study is to inspect the effect of geopolitical risks on the daily returns and volatilities of the MENA indices. Initially, the analysis is done covering the full sample period i.e. from 3 January, 2016 to 15 June, 2022. Later, two main periods were created; the first period includes the repercussions of the Arab Spring and tensions in the Gulf region, especially between Saudi Arabia and Qatar covering from 3 January, 2016 to 30 December, 2019. The second period includes the current war between Russia and Ukraine covering the period of 24 February, 2022 to 15 June, 2022. Further, the impact of the Corona pandemic is also discussed as an additional third period to understand the effect of volatilities in the returns of the indicators during the study period.

The rest of the paper moves as follows. Section 2 presents the related literature review. Section 3 details data and methodology. The findings of the analysis are presented in section 4 and the last section offers the conclusion and discussion.

1. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Recently, the interest in studying the effect of geopolitical risks (GPR) on financial markets has increased. Geopolitical risks are viewed as important determinants of investors' investment decisions. It is documented that the increased levels of geopolitical tension results in several negative consequences such as a decrease in stock returns, lower economic activities, higher markets volatility, and redirection of capital to more stable environments (Berkman et al., 2011; Caldara & Iacoviello, 2022; Dogan et al., 2021; Elsayed and Helmi, 2021). The link between geopolitical risks and financial markets can be explained by several theoretical perspectives. The core theory is the efficient market hypothesis which assumes that assets' prices are a reflection of the available information in the market, thus the value of the company is quantified by its share price (Fama, 1970). Market participants, therefore, reevaluate market risk and immediately alter their investment decision upon the arrival of new information. Thus, when it comes to extreme positive or negative events, financial markets will respond quickly and adjust their prices, depending on their level of efficiency (Fama et al., 1969). In this regard, the event study theory assumes that the reaction of financial markets to a certain event can be easily detected by the change of share price around this event, simply by calculating abnormal and the cumulative abnormal return during the event window (Ball and Brown, 1968; Mackinlay, 1997).

From the psychological literature, the explanations of the effect of geopolitical risks on financial markets lie in the investors' behavior and sentiment. In this regard, these theories argue that investors in the financial markets tend to overreact to the news of geopolitical uncertainty. Thus, the presence of geopolitical risks stimulates strong emotional reactions for market participants such as anxiety or fear leading to irrational behavior that might result in assets' mispricing (De Bondt, 1989; Sunstein and Zeckhauser, 2011). The political literature also supports the link between geopolitical uncertainty and financial markets. These studies view certain events such as anti-government demonstrations, riots, and assassinations increase instability in the markets. Theoretically, Schwert (1989) in his model, supports and provides evidence that geopolitical risks lead to higher volatilities in the financial markets.

The empirical evidence on the association between geopolitical risks and financial markets is generally limited. However, the available evidence tackles this relationship from different angles. For example, part of the literature examines how GPR affects stocks' returns and volatilities. An important study by Pastor and Veronesi (2013) employs a policy uncertainty (PU) index and develops a general equilibrium model that tests how political uncertainty affects share prices in S&P 500 index from January 1985 through December 2010. The findings reveal that policy uncertainty calls for a higher risk premium, leading to higher stock volatility and correlation, particularly, in weaker economic settings. From the same setting, Chuliá et al. (2017) were the first who use the quantile impulse-response functions to evaluate how US policy and equity market uncertainties are related not only to the domestic stock returns but also to the mature and emerging financial markets. The study used long daily observations covering from Jan.1998 to March 2016. The study found that uncertainties have a negative effect on stock returns for both mature and emerging markets but more for emerging ones. However, weak negative evidence is documented for US Policy uncertainty on the returns of financial emerging markets.

From Korea, Jin Pyo (2020) investigates the relationship between geopolitical events on financial market behavior. The research shows that positive geopolitical events positively influence stock returns, and the opposite is also true. However, on the aggregate level, geopolitical tensions have no significant effect on either stock price index, industrial output, employment, or even gross trade volume indicating that these factors immune toward such geopolitical shocks. Hoque and Zaidi (2020) report a nonlinear effect of both global and country-specific geopolitical risk events on the returns of stock markets. The study employs a three-regime Markov-switching approach using data from five emerging economies namely, Brazil, India, Indonesia, South Africa, and Turkey. While the nonlinear relationship is clearly detected, the study reveals that global geopolitical tensions could have positive and negative impacts depending on several factors like volatility regimes, time lag, and the stock market. In the meanwhile, the country-specific political risks appear with a negative effect on all the stock markets' performance except the Indian stock market.

Another cross-country evidence is provided by Elsayed and Helmi (2021). Their study tests how geopolitical risks are related to returns and volatilities dynamics in the MENA region which includes countries from the Middle East and North Africa. The study employs the GPR index to cover different geopolitical

tensions including wars, terrorism, and political uncertainty. The ADCC-GARCH model and a spillover approach show interesting results. The GPRs are not related to the return spillovers of financial markets for this region. Nevertheless, when the dynamic analysis is applied, the findings show that the total spillover index is highly responsive to the main political tensions in the region. Moreover, three countries namely, Saudi Arabia, Qatar, and the United Arab of Emirates are considered the core transmitters of return spillovers to the rest of the financial markets in this region.

A recent and important study is carried out by Caldara and Iacoviello (2022) covering 26 advanced economies over a very long period starting from 1900 to 2019. The study developed a GPR index that considers the timing and the severity of the negative geopolitical tensions. The VAR analysis reaches important and exciting findings. First, GPR negatively affects most of the macrocosmic variables i.e. lowering employment, export, and GDP for most economies. Second, as GPR increases a significant decrease in the stock prices is documented, this is noticed in 17 advanced economies according to the authors. The study concludes that GPR is a key driver of stock price movements in most financial markets, and more importantly, GPR spreads among markets because of a lack of confidence among investors in addition to the uncertainty regarding economic policy.

A separate strand of the literature examined sectoral analysis. For instance, Apergis et al. (2018) apply nonparametric causality tests to investigate if GPR can predict the movements and volatilities of stock returns in 24 global defense companies. The findings reveal that GPR can predict the volatility of 50% of these companies but not the movements of stock returns. From a different sector i.e. travel and leisure, Demiralay and Kilincarslan (2019) provide consistent evidence and report that GPR negatively affects stock index returns of major travel and leisure companies around the world, with the exception of the Asia & Pacific index. Consistent findings are reported for the Chinese tourism stock return by Jiang et al. (2020) and China's renewable energy stock market by Yang et al. (2021).

Recently, the current conflict between Russia and Ukraine also has been studied by Izzeldin et al. (2022). The study examines the reaction of the European and worldwide financial stock markets, in addition to certain commodities to the Russian invasion, and offers a comparison with previous pandemic and crisis. The findings reveal that financial markets react earlier to this military conflict compared with Covid-19 or even the global financial crisis. However, the negative duration is less compared with above mentioned two events. With regard to commodities, the study highlights that the most affected commodities are Wheat and nickel. Yousaf et al. (2022), consider how the conflict between Russia and Ukraine influences several financial markets from the G20 and the rest of the world. Using event study analysis, the military actions affect most of the sampled financial markets in a very negative way, particularly the Russian market. The study also indicates that the financial markets of Hungary, Russia, Poland, and Slovakia are among the first who were affected. Moving to a more comprehensive paper, Hossain and Al Masum (2022) employ daily observations from 39 financial markets. The study offers clear evidence of the negative effect of the Russian-Ukrainian conflict on the volatilities of the major financial markets. Moreover, this geopolitical risk also leads to a sharp decline in the major stock indices as well as the global currencies. Further, countries in the Euro-zone were the most negatively affected, compared with the rest of the world. Based on the above discussions we prose the following hypothesis:

H1: Geopolitical risk has a statistically significant negative effect on the MENA equity markets.

H1a: Geopolitical risk has a statistically significant negative effect on the daily returns for MENA equity markets.

H1b: Geopolitical risk has a statistically significant effect on the daily volatility for MENA equity markets.

2. DATA AND METHODOLOGY

2.1 Data

To examine the impact of geopolitical risks on MENA indices, these main indices are determined based on the availability of daily data. These 13 indices represent most of the MENA countries, namely Saudi Arabia, Dubai, Abu Dhabi, Qatar, Kuwait, Bahrain, Iraq, Oman, Jordan, Palestine, Egypt, Tunisia and Morocco. The study data were downloaded from the https://www.investing.com/indices/website.

The time period of this study covers from 3 January, 2016 to 15 June, 2022. The entire time period is examined for the volatility of the MENA indices returns to form a general framework for the results of the study. To study the impact of geopolitical risks, two main periods are selected. The first time period of this study is investigated from 3 January, 2016 to 30 December, 2019 before the spread of the Corona pandemic is investigated, as a period that included the tension in the region following the Arab Spring revolutions and the tension in Gulf relations, especially between Saudi Arabia and Qatar. The second period is after the Corona pandemic, the beginning of the Russian-Ukrainian war that began in 24 February, 2022 until the time of this study. The volatility in the returns of the MENA indices during the Corona pandemic period is also discussed because it came during the study period. Table 1 provides a comprehensive statistical description of all MENA indices used in this study.

Table 1. Descriptive Statistics

MENA Countries	Av. %	S.D. %	Max. %	Min. %	Skew.	Kurt.	Obs.
Abu Dhabi	0.055	1.047	8.411	-8.063	-0.15	14.48	1612
Saudi Arabia	0.039	1.054	7.07	-8.32	-0.98	9.62	1611
Kuwait	0.031	1.122	6.34	-25.44	-8.96	183.27	1588
Egypt	0.030	1.275	6.70	-9.34	-0.39	5.95	1571
Bahrain	0.028	0.553	3.48	-5.82	-0.99	13.68	1585
Tunis	0.024	0.455	2.71	-4.10	-1.20	11.87	1612
Morocco	0.023	0.731	5.45	-8.82	-1.55	24.92	1607
Qatar	0.017	0.973	5.51	-9.70	-0.93	12.40	1604
Palestine	0.016	0.430	2.63	-3.67	-0.32	7.58	1553
Dubai	0.010	1.118	7.32	-8.29	-0.50	9.82	1612
Jordan	0.010	0.491	2.75	-4.48	-0.01	8.23	1563
Iraq	-0.011	0.907	4.039	-2.821	0.81	4.53	1376
Oman	-0.016	0.528	3.25	-5.57	-0.82	11.41	1590

Source: own

Table 1 presents the statistical description of mean returns, standard deviation, highest and lowest value, skewness, kurtosis, and number of observations for MENA indices from 3 January, 2016 to 15 June, 2022. The Abu Dhabi index achieves the highest average return among the MENA indices by about 0.055%, while the Oman index achieves the lowest negative average return of -0.016%. All MENA indicators indicate highly volatility, measured by standard deviation. The standard deviation clearly shows higher values than the average. The large difference between the minimum and maximum values confirms the large fluctuation in the MENA indices. It is clear that the MENA indicators are mostly around zero and skewed to the left, with the exception of the Kuwait indicator, which reports -8.96, while kurtosis indicates the presence of some extreme values. The last column displays the number of observation for each index.

2.2 Research Methods

The Generalized Autoregressive Conditional Heteroscedasticity (GARCH) is used in this study to find out the effect of geopolitical risks on the volatility of returns for the MENA indices. The ARCH group is very important in determining the effect of variability of returns (Chaudhary, Bakhshi, and Gupta, 2020). Therefore, it is used in this study. The use of the GARCH (1, 1) model enhances the knowledge of the effect of change in volatility over time (Engle, 1982). The natural logarithm of the MENA indices prices is calculated in order to arrive at the returns of these indices as follows:

$$R_i = \left(\frac{P_{it}}{P_{i,t-1}}\right) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(1)$$

Where:

R_i is return of MENA index *i*, P_{it} is the price of MENA index *i* at *t* day, P_{it-1} is the price of MENA index *i* at *t*-1 day.

2.2.1 Unit-Root Test

In time series analysis studies, the stationary of the data is checked using the unit root test. The two most commonly used tests in this field are Augmented Decker-Fuller (ADF) and Philips-Peron (PP). They are two tests that measure whether time series are stationary over time. The Augmented Decker-Fuller (ADF) is calculated based on the following:

$$\Delta y_t = \alpha_0 + \gamma_t y_{t-1} + \sum_{i=1}^{p} \beta_i \Delta y_{t-i} + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(2)$$

Where:

Δ is the first difference operator, y_t is time series, α_0 is the intercept, *p* is the optimum number of lags, ε_t indicates the residual errors, $\gamma = 0$ when series is not stationary and there is a unit root problem.

The Phillips-Peron (PP) is calculated based on the following:

$$\Delta y_t = (\rho - 1) y_{t-1} + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(3)$$

Δ is the first difference operator, y_t is time series, ε_t indicates the residual errors, this test makes a non-parametric correction to the *t*-test statistic.

2.2.2 ARCH Effect Test

Before applying the GARCH model, Engel (1982) referred to an important condition, which is the application of the heterogeneity test and the presence of the ARCH and GARCH effect. Thus, the Autoregressive Conditional Heteroscedasticity-Lagrange Multiplier test (ARCH-LM) is applied in this study as follows:

$$u_t^2 = \gamma_0 + \gamma_1 u_{t-1}^2 + \gamma_2 u_{t-2}^2 + \cdots + \gamma_q u_{t-q}^2 + \upsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots(4)$$

Where:

u^2 is the square residual, q number of lags, γ_0 is the intercept, $\gamma_1, \gamma_2 \cdots \gamma_q$ are the unknown coefficients with q as order, and υ indicates a random term.

2.2.3 GARCH Model

The generalized ARCH model is usually used to overcome the large number of parameters used in the ARCH model. Bollerslev (1986) introduced the GARCH model and distinguished it from the ARCH model because it distinguishes between late volatility and current shocks. Thus, the GARCH (1, 1) or GARCH model provides a better understanding of market volatility than the ARCH model. It can be written in the following way:

$$u_t^2 = \omega + \sum_{i=1}^{q} \alpha_i \varepsilon_{t-i}^2 + \sum_{i=1}^{p} \beta_i \lambda_{t-i}^2 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

Where:

u is the conditional variance, ω is the intercept term, p and q is number of lags in the conditional variance terms; α and β is coefficients for the terms ARCH and GARCH, ε_{t-i} is the residual squared lag (ARCH term) from the prior year, λ_{t-1} is the variation from the prior year (GARCH term).

When a large volatility appears in a time series after the stabilization period, this is called cluster volatility. To address cluster volatility, an ARCH and CARCH model was developed to handle correlations in error variance. An increase in ARCH coefficient α indicates an increase in the influence of recent information, while an increase in beta coefficient β indicates delayed information and an increase in the lag of the shock fade time. The sum of ARCH and CARCH $(\alpha + \beta)$ means that the time series are consistent and the higher their values, the longer the volatility continues over a longer period of time. In times of crisis, cluster fluctuations are present (Predescu & Stancu, 2011). Therefore, to address these cluster fluctuations during geopolitical risks, ARCH and CARCH is used to capture these cluster volatility.

The GARCH model is used first over the entire study period to examine the effect of volatilities in the returns of the MENA indices. Then the study sample was divided into two main periods, the first period being geopolitical risks before the Corona pandemic over the period of 3 January, 2016 to 30 December, 2019, which includes the repercussions of the Arab Spring and tensions in the Gulf region, especially between Saudi Arabia and Qatar. The second period after the Corona pandemic over the period of 24 February, 2022 to 15 June, 2022 relates to the current geopolitical risks of the war between Russia and Ukraine. Because the Corona pandemic is during the study period over the period of 30 December, 2019 to 24 February, 2022, the impact of the pandemic is also discussed as an additional third period to understand the effect of volatilities in the returns of the indicators during the study period.

2.2.4 EGARCH Model

The exponential general autoregressive conditional heteroskedastic (EGARCH is another form of the GARCH family. EGARCH was developed by Nelson (1991) to solve the GARCH weakness in processing financial time series. This model is used in the event that the sum of the coefficients of ARCH and GARCH is more than one, as it allows determining the asymmetric effects between the positive and negative asset returns. A model can be written as follows:

$$\log(\sigma_t^2) = \alpha_0 + \sum_{j=i}^{\rho} \beta_j (\sigma_{t-j}^2) + \sum_{j=1}^{q} \left(\alpha_i \left| \frac{e_{t-i}}{\sigma_{t-i}} \right| + \gamma \frac{e_{t-i}}{\sigma_{t-i}} \right) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (6)$$

Where: α_j is coefficient ARCH, β_i is coefficient GARCH, and γ is coefficient leverage effect.

3. RESULTS

Test for Unit Root

Table 2 shows the results of the Augmented Dickey Feller and Phillips-Perron tests. The results indicate that the market indices for the entire MENA countries are stationary. The *p*-value of all results of the Augmented Dickey Feller and Phillips-Perron are lower than 5 precent. Therefore, the MENA market indices are integrated at the level zero.

Table 2. Unit Root Test

MENA Countries	Augmented Dickey-Fuller		Phillips-Perron	
	t-Statistics	Prob.	t-Statistics	Prob.
Abu Dhabi	-15.12478	0.0000	-38.45322	0.0000
Saudi Arabia	-35.30210	0.0000	-35.29851	0.0000
Kuwait	-35.10093	0.0000	-35.36604	0.0000
Egypt	-31.13252	0.0000	-31.07511	0.0000
Bahrain	-23.64363	0.0000	-36.70603	0.0000
Tunis	-30.96387	0.0000	-30.95635	0.0000
Morocco	-33.92009	0.0000	-34.07103	0.0000
Qatar	-36.79145	0.0000	-36.86748	0.0000
Palestine	-23.20143	0.0000	-36.11943	0.0000
Dubai	-35.28786	0.0000	-35.95576	0.0000
Jordan	-31.56861	0.0000	-32.07983	0.0000
Iraq	-35.27169	0.0000	-35.26236	0.0000
Oman	-30.10394	0.0000	-30.47071	0.0000

Source: own

Test for Heteroscedasticity and Autocorrelation Errors

Table 3 includes the results of heteroskedastisty error test in Panel A, while Panel B details the results of autocorrelation error test for all MENA market indices. The result in Panel A of Table 3 shows that all MENA market indices are statistically significant at the level of 5%, except for the Kuwaiti index. This means that the data of most MENA market indices have a problem of heterogeneity. On the other hand, the results in Panel B of Table 3 show that All MENA market indices are also statistically significant at the level of 5%, except for Abu Dhabi and Iraq indices. Therefore, using a linear autoregressive model is unacceptable because it violates the basic assumptions of the ordinary least square (OLS) model. To solve this problem, this study uses the generalized autoregressive conditionally heteroskedasticity GARCH (1, 1) model rather than OLS model.

Table 3. Heteroscedasticity and Autocorrelation Errors

Panel A: Heteroscedasticity ARCH test results		
MENA Countries	Obs*R-squared	Prob. Chi-Square(1)
Abu Dhabi	255.6263	0.0000
Saudi Arabia	278.2819	0.0000
Kuwait	2.130542	0.1444
Egypt	154.7802	0.0000
Bahrain	111.5021	0.0000
Tunis	476.6105	0.0000

Morocco	87.83543	0.0000
Qatar	29.11201	0.0000
Palestine	32.70554	0.0000
Dubai	254.5869	0.0000
Jordan	206.0066	0.0000
Iraq	124.3191	0.0000
Oman	59.36058	0.0000
Panel B: Autocorrelation errors test		
MENA Countries	*Obs*R-squared*	*Prob. Chi-Square(2)*
Abu Dhabi	5.355396	0.0687
Saudi Arabia	26.04015	0.0000
Kuwait	24.71889	0.0000
Egypt	88.96818	0.0000
Bahrain	41.76272	0.0000
Tunis	96.79415	0.0000
Morocco	42.62900	0.0000
Qatar	10.66398	0.0048
Palestine	44.58206	0.0000
Dubai	25.62613	0.0000
Jordan	79.17311	0.0000
Iraq	3.447161	0.1784
Oman	117.3435	0.0000

Source: own

Test for Autoregressive Conditional Heteroscedasticity

To address the problem of heterogeneity in errors and to check if the GARCH (1, 1) solve the problem, this study uses a measure of ARCH-LM test. Table 4 shows the results of the heterogeneous conditional autoregressive. The results show that the *p*-value for all MENA market indicators is less than 5%, and this confirms that the use of GARCH (1, 1) model solves the problem

Table 4. ARCH-LM Test

	Results of ARCH-LM test	
MENA Countries	*Obs*R-squared*	*Prob. Chi-Square(1)*
Abu Dhabi	0.154146	0.6948
Saudi Arabia	0.185512	0.6667
Kuwait	-	-
Egypt	0.109512	0.7407
Bahrain	0.085389	0.7701
Tunis	0.686400	0.4074
Morocco	0.019811	0.8881
Qatar	0.076931	0.7815
Palestine	0.143818	0.7045
Dubai	2.343938	0.1258
Jordan	2.746834	0.0974
Iraq		
Oman	8.895330	0.0686

Source: own

Test for GARCH (1, 1) Model

Table 5 displays the results of returns and volatilities of MENA market indices based on the auto-regressive conditional heterokedostic model GARCH (1, 1). This model is used in this paper to improve the linear and simple autoregressive model by solving the problem of heterogeneity of variance. Table 5 is divided into Panel A, B and C. Panel A in Table 5 shows the returns and volatilities of the MENA indices for the full sample period extending from 3 January, 2016 to 15 June, 2022. Panel B shows the returns and volatility of the MENA indices during the period of the Corona pandemic extending from 30 December, 2019 to 23 February, 2022, while the third period, which is Panel C shows the returns and volatilities of the MENA indices during the period of the geopolitical war between Russia and Ukraine extending from 24 February, 2022 to 15 June, 2022.

Table 5. GARCH Model results

MENA Countries	μ	ω	α (ARCH effect)	β (GARCH effect)	$\alpha + \beta$	Log likelihood
Panel A: GARCH (1,1) Full sample period from 3 January, 2016 – 15 June, 2022						
Abu Dhabi	0.000745*	0.0000062	0.144222*	0.771345*	0.915567	5399.004
Saudi Arabia	0.000750*	0.0000047	0.154338*	0.801624*	0.955962	5253.336
Kuwait	0.000139	0.0000444	0.314644*	0.429090*	0.743734	5016.471
Egypt	0.000455	0.0000121	0.149614*	0.773519*	0.923133	4794.264
Bahrain	0.000301*	0.0000043	0.185066*	0.665858*	0.850924	6173.038
Tunis	0.000163	0.0000024	0.295589*	0.592432*	0.888021	6549.941
Morocco	0.000475*	0.0000044	0.195160*	0.704879*	0.900039	5905.692
Qatar	0.000507**	0.0000056	0.150358*	0.795634*	0.945992	5277.852
Palestine	0.0000442	0.0000033	0.169368*	0.656408*	0.825776	6338.563
Dubai	0.000163	0.0000043	0.100925*	0.854676*	0.955601	5173.273
Jordan	0.0000126	0.0000019	0.183305*	0.732920*	0.916225	6314.503
Iraq	-0.000250	0.0000185	0.291282*	0.488359*	0.779641	4658.647
Oman	-0.000322*	0.0000026	0.188702*	0.720971*	0.909673	6223.148
Panel B: GARCH (1,1) Geopolitical risk during the period of 3 January, 2016 – 29 December, 2019						
Abu Dhabi	0.000242	0.000002*	0.052256*	0.912064*	0.964251	3419.398
Saudi Arabia	0.000412	0.000005*	0.159139*	0.785603*	0.944742	3296.861
Kuwait	0.000252	0.000049	-0.000376	0.568385	0.568009	3117.980
Egypt	0.000686	0.000028*	0.193487*	0.651737*	0.845224	3028.747
Bahrain	0.000191	0.000005*	0.219932*	0.542241*	0.762173	3932.827
Tunis	0.000137	0.000002*	0.281673*	0.602852*	0.884525	4112.291
Morocco	0.000212	0.000007	0.209566	0.581066	0.790632	3769.696
Qatar	0.000209	0.000007*	0.080604*	0.838382*	0.918986	3229.265
Palestine	-0.000031	0.000005*	0.120648*	0.564970*	0.685618	4068.475
Dubai	-0.000075	0.000004*	0.068693*	0.883992*	0.952685	3328.389
Jordan	-0.000100	0.000003*	0.184597*	0.626006*	0.810603	4147.319
Iraq	-0.000566**	0.000014*	0.228212*	0.568454*	0.796666	2975.847
Oman	-0.000495*	0.000003*	0.154206*	0.733164*	0.88737	3911.354
Panel C: GARCH (1,1) COVID-19 during the period of 30 December, 2019 – 23 February, 2022						
Abu Dhabi	0.001323*	0.000006*	0.190147*	0.742854*	0.933001	1819.317
Saudi Arabia	0.001268*	0.000004*	0.155347*	0.819446*	0.974793	1795.030
Kuwait	0.001014*	0.000004*	0.432603*	0.639460*	1.072063	1795.875
Egypt	0.000476	0.000008*	0.169777*	0.772678*	0.942455	1640.342
Bahrain	0.000812*	0.000005*	0.171290*	0.685871*	0.857161	2028.156
Tunis	0.000164	0.000002*	0.326920*	0.575186*	0.902106	2219.602
Morocco	0.000738*	0.000003*	0.162723*	0.786200*	0.948923	1965.091

Qatar	0.000806*	0.000003*	0.180903*	0.778925*	0.959828	1896.452
Palestine	0.000112	0.000004*	0.236578*	0.632143*	0.868721	1998.938
Dubai	0.000520	0.000004*	0.128943*	0.848945*	0.977888	1694.326
Jordan	0.000300	0.000002*	0.167345*	0.773235*	0.94058	1921.549
Iraq	0.000484	0.000026*	0.354147*	0.434588*	0.788735	1435.956
Oman	-0.000005	0.000003*	0.233416*	0.698590*	0.932006	2059.303
Panel D: GARCH (1,1) Geopolitics Risks during the period of 24 February, 2022 – 15 June, 2022						
Abu Dhabi	0.001545	0.0000037	0.093279	0.956951*	1.05023	175.3544
Saudi Arabia	0.002085*	0.0000033	0.006636	1.164184*	1.17082	179.3340
Kuwait	0.000298	0.0000071	0.403905*	0.770507*	1.174412	230.2135
Egypt	-0.003038*	0.0000006	0.120688	1.048908*	1.169596	214.1998
Bahrain	-0.001298	0.0000463	0.184522	0.346738	0.53126	249.9235
Tunis	0.000942*	0.0000060	0.112559	0.441270	0.553829	231.5320
Morocco	0.001360*	0.0000006	2.221068*	0.581658*	2.802726	208.2406
Qatar	-0.001111	0.0000056	0.061196	1.163068	1.224264	180.0939
Palestine	0.001219**	0.0000125	0.516669**	0.182210	0.698879	287.5629
Dubai	0.001060	0.0000048	0.183379	1.124874*	1.308253	169.0528
Jordan	0.000916	0.0000026	0.361805	0.800797*	1.162602	262.6095
Iraq	-0.000499	0.0000007	0.452357**	1.007401*	1.459758	260.6992
Oman	0.000152	0.0000001	0.063481	0.983005*	1.046486	268.5193

*(P<0.01), ** (P<0.05)

Source: own

Panel A in Table 5 shows that, the full sample period, the conditional mean (μ) coefficient of the stock market indices of Abu Dhabi, Saudi Arabia, Bahrain, Morocco, Qatar are positive and statistically significant, while Kuwait, Egypt, Tunis, Palestine, Jordan, Dubai and Iraq are positive but statistically insignificant. However, the conditional mean of Oman index is only negative and statistically significant.

Panel A in Table 5 displays that the long-term variance (ω) which is statistically significant at the level of most of the MENA stock exchanges. This means that the GARCH (1, 1) succeeded in modelling the fluctuations during the full sample period for all the MENA market indices. In addition, the α (ARCH effect) and β (GARCH effect) coefficients are statistically significant. This is evidence that most of the MENA market indices are influenced by recent information and old news. However, the GARCH effect coefficients are larger than ARCH effect coefficients, which mean that market participants take into account older news more than new information, as well as old news is taking a long time to fade and volatility continues. Panel (A) in Table 5 also shows that the sum of the ARCH and GARCH coefficients ($\alpha + \beta$) is close to one, Abu Dhabi (0.915567), Saudi Arabia (0.955962), Egypt (0.923133), Morocco (0.900039), Dubai (0.955601), Jordan (0.916225), and Oman (0.909673), which means a severe and slow endings of the volatility shock. For the Bahrain, Tunis, and Palestine, the sum of ARCH and GARCH coefficients ($\alpha + \beta$) are 0.850924, 0.888021, and 0.825776, respectively. This indicates that the continuation of the shock of the medium volatility. Finally, the indicators of the remaining countries are Iraq 0.779641 and Kuwait 0.743734. This means that that the shock of relatively low volatility continues.

Panel B in Table 5 shows that, Geopolitical risks arising from the repercussions of the Arab Spring and tensions in the Gulf region from January 3, 2016 to December 30, 2019, indicate that there is a difference in the mean returns of the MENA indices. The conditional mean (μ) coefficient of the stock market indices of Abu Dhabi, Saudi Arabia, Kuwait, Egypt, Bahrain, Tunisia, Morocco and Qatar are positive but statistically insignificant, while the indices of the Palestine, Dubai, Jordan, Iraq and Oman are negative and statistically insignificant, except of Iraqi and Omani indices, which are negative and statistically significant. Therefore, we reject the hypothesis that indicates geopolitical risks have a negative and statistically significant effect on the daily returns of stock markets in the MENA region; while accept it for Iraqi and Omani indices.

Panel B in Table 5 displays that the long-term variance (ω) is statistically significant at the level of most of the MENA stock exchanges, except of Kuwait and Morocco. This means that the GARCH (1, 1) succeeded in modelling the fluctuations during the repercussions of the Arab Spring and tensions in the Gulf region for most the MENA market indices, except of the Kuwait and Morocco index because they are not statistically significant. The increased levels of geopolitical tension lead higher markets volatility and this result is consistent with previous finding such as Schwert (1989), Berkman, Jacobsen, and Lee (2011), Caldara and Iacoviello (2022), Dogan et al. (2021) and Elsayed and Helmi (2021). In addition, the α (ARCH effect) and β (GARCH effect) coefficients are statistically significant. This is evidence that most MENA market indices are influenced by recent information and old news. However, the GARCH effect coefficients are larger than ARCH effect coefficients, which mean that market participants take into account older news that is larger than new information, as well as old news is taking a long time to fade and volatility continues. These findings confirm the investor behaviour theory that investors in financial markets tend to overreact to news of geopolitical uncertainty. Thus, the presence of geopolitical risks induces strong emotional reactions of market participants such as anxiety or fear leading to irrational behaviour that may lead to mispricing of assets (De Bondt 1989; Sunstein and Zeckhauser 2011).

Panel B in Table 5 also shows that the sum of ARCH and GARCH coefficients ($\alpha + \beta$) is close to one, Abu Dhabi (0.96425), Saudi Arabia (0.94474), Qatar (0.91898) and Dubai (0.95268), which means a severe and slow endings of the volatility shock. For the Oman, Tunis, Egypt and Jordan, the sum of ARCH and GARCH coefficients ($\alpha + \beta$) are 0.88737 0.88452, 0.84522, and 0.810603, respectively. This indicates the continuation of the shock of the medium volatility. Finally, the indicators of the remaining countries are Iraq 0.796666, Bahrain 0.790632, Palestine 0.762173, and Kuwait 0.568009. This means that that the shock of relatively low volatility continues. Therefore, we accept the hypothesis that Geopolitical risk has a statistically significant effect on the daily volatility for MENA equity markets, while reject it for Moroccan index. These results indicate that MENA indices fluctuate in geopolitical risks results and contradict with finding of Jin Pyo (2020) who find that geopolitical tensions in Korea have no significant effect on either stock price index, industrial output, employment, or even gross trade volume indicating that these factors immune toward such geopolitical shocks.

Panel C in Table 5 shows that, during the Corona pandemic period, the conditional mean (μ) coefficient of the stock market indices of Abu Dhabi, Saudi Arabia, Kuwait, Bahrain, Morocco and Qatar are positive and statistically significant. It is noted that all of these countries are from the Gulf countries, except of Morocco stock market and these Gulf countries can benefit from the high prices in the energy sector, which supported the returns of shares in these markets, especially when oil and gas prices rose during the year 2021. On the other hand, all other countries' markets in the MENA are positive, but they are not statistically significant, except for the Oman, which was negative.

Panel C in Table 5 shows that results of stock indices volatility are relatively similar to the results in panel A. The long-term variance (ω) is statistically significant for all the stock exchanges. This means that the GARCH (1, 1) succeeded in modelling the fluctuations during the COVID 19 periods for all the MENA market indices. Also, the (ARCH effect) and (GARCH effect) coefficients are all positive and statistically significant. In addition, this is evidence that most of the MENA market indices are affected by recent information and old news during the Corona pandemic period. In particular, the ARCH coefficients in Panel C are greater than ARCH coefficients in Panel A. This is evidence that recent news has a greater impact due to the influence of these markets by the news of the Corona pandemic. However, the GARCH effect coefficients are larger than the ARCH effect coefficients, which mean that market participants take into account old news that has more influence than new information, as well as old news that takes a long time to fade and volatility continues. Panel C in Table 5 also shows that the sum of the ARCH and GARCH coefficients is slightly less than one, except of Bahrain and Iraq. This means severe and slow endings of the volatility shock for all the MENA market indices. For the Bahrain and Iraq index, the shock of relatively low volatility continues.

Table 5 Panel D shows that the conditional mean (μ) of the MENA market indices during the period of the Geopolitical risks of the Russian-Ukrainian war is affected and its performance relatively declined. It is clear that the highest conditional mean among MENA countries is Saudi Arabia 0.002085, while the lowest conditional mean is Egypt -0.003038. In addition, there are 4 countries such as Saudi Arabia, Tunis,

Morocco, and Palestine have positive and statistically significant conditional mean, while 4 countries Abu Dhabi, Kuwait, Dubai, Jordan and Oman have positive but statistically insignificant conditional mean. In contrast, the four remaining countries in the MENA (Egypt, Bahrain, Qatar and Iraq) have negative conditional mean, but they are not statistically significant, except for Egypt, which are statistically significant. Therefore, we reject the hypothesis that geopolitical risks have a negative and statistically significant effect on the daily returns of stock markets in the MENA region, while accept it for Egyptian index.

Table 5 in Panel D shows that the variance value reached the highest level in the index of Palestine, which is 0.0000125 and statistically significant at the level of 5%, while it is the lowest in the Omani market, which is 0.0000001, but it is not statistically significant. However, Panel D displays that the long-term variance (ω) is not statistically significant for all the stock exchanges. This means that the GARCH (1, 1) failed in modelling the fluctuations during the Russian-Ukrainian war periods for all the MENA market indices. Looking at the coefficient of ARCH, it reached the maximum level in the Morocco, Palestine, Iraq and Kuwait indices and they are statistically significant. This is evidence that recent information or the Russian-Ukrainian war have a significant impact on these markets. On the other hand, looking at the GARCH (1, 1) coefficient, all the coefficients of the MENA markets are statistically significant, except of four markets: Bahrain, Tunisia, Qatar and Palestine. This is evidence that most of the MENA markets are affected by long-term news. Table 5 in Panel C also shows that in most MENA markets, the sum of ARCH and GARCH coefficients ($\alpha + \beta$) is more than one. This is evidence of the continuity of oscillation shocks, which requires dealing with a special type of these models, which is the EGARCH model, where the shock leads to infinity.

Table 6. EGARCH Model Results

MENA Countries	C = μ	C(2) = ω	C(3) = α	C(4) = γ	C(5) = β	Log likelihood
EGARCH Geopolitical Risks during the period of 24 February, 2022 – 15 June, 2022						
Abu Dhabi	0.001434	-10.29856	0.171824	0.315523	-0.050983	170.3157
Saudi Arabia	0.001372	-3.659532	-0.046313	-0.215223	0.618843	170.8059
Kuwait	0.000435	-1.516729	-0.131719	-0.451865*	0.830213*	235.7946
Egypt	-0.001857	-0.155307	-0.117783*	0.163698	0.975313*	212.9134
Bahrain	-0.001500	-10.93567*	1.204186*	0.480677*	-0.043395	252.8612
Tunis	0.000303	-7.403996*	-0.921219*	0.465674	0.305300	228.9873
Morocco	0.000725	-1.982999*	0.345119	-0.448227*	0.837458*	205.6583
Qatar	-0.002429	-5.713638**	0.670125	0.334457	0.435470	175.3994
Palestine	0.001138	-17.05357	-0.231752	-0.142163	-0.629733	286.5394
Dubai	0.001059	-6.583610**	1.171907**	0.128161	0.401058	164.0513
Jordan	0.001062	-1.243138	0.359866	0.085519	0.904997	262.5612
Iraq	-0.000801	-3.587110	0.618892*	-0.104496	0.696652*	258.1241
Oman	0.000130	-7.351618	-0.304044	0.464465**	0.270019	264.1801

Source: own

Table 6 displays the results of EGARCH (1, 1) during the geopolitical risks over the period of 24 February, 2022 – 15 June, 2022. The result of Table 6 shows that the long-term variance (ω) is statistically significant for indices of Bahrain, Tunis, Morocco, Qatar, and Dubai, while is not statistically significant for others. Therefore, we accept the hypothesis that Geopolitical risk has a negative and statistically significant effect on the daily volatility for Bahraini, Tunisian, Moroccan, Qatari and Dubai indices, while reject it for remaining MEAN indices. This result supports the results documented by Izzeldin et.al (2022), Yousaf et.al (2022), Al Masum (2022). The results of this study are also in consistent with Elsayed and Helmi (2021) when they apply dynamic analysis in the MENA markets.

Table 6 also shows γ is the coefficient of the asymmetric term and it is negative and statistically significant for the Kuwaiti and Moroccan indices. This means that there is strong evidence of the effect of

leverage. In other words, a negative news or shock has larger effect on the conditional variance compared to positive news or shock. The indicators of Saudi Arabia, Palestine and Iraq, γ is negative, but it is not statistically significant. Thus, the EGARCH (1, 1) specification failed to model the volatility of these indices due to the inability of the model to improve the probability. Therefore, the effect of financial leverage does not exist. For the Bahraini index, γ is positive and statistically significant at the 1% level, while for the Omani index it is positive and statistically significant at the 5% level. In other words, a positive news or shock has larger effect on the conditional variance compared to negative news or shock. For the rest of the indicators, namely Abu Dhabi, Egypt, Tunis, Qatar, Dubai, and Jordan, γ is positive but not statistically significant. Given β, it is relatively low in most indicators and sometimes negative. This suggests that shocks are less persistent, and resolve faster during a period of geopolitical risk.

CONCLUSION AND DISCUSSION

This study examines the volatility characteristics of MENA indices returns based on the GARCH and EGARH model. These models helped us understand the volatility of indices returns in the MENA countries and provide an important background for investors and decision makers. The current study provides several conclusions from the previous analysis: MENA indices are characterized by large volatility, especially during the geopolitical risks that proceeded the Corona pandemic period, and this indicates that these markets are interconnected and affected by each other. This paper also showed greater volatilities in the MENA indices during the Corona pandemic period, especially from recent news side. The GARCH model can be applied to the MENA indices because it reflects the volatility of returns with high accuracy, especially in the period of the overall study and in the period of geopolitical risks before the Corona pandemic, as well as during the Corona pandemic period. The results of the study also showed, based on the GARCH model, that the volatilities of returns in the MENA indices persist for long periods with a gradual decline over time.

For the geopolitical risk period of the Russian-Ukrainian war, the GARCH model failed to model the volatility of the MENA indices' returns. Therefore, the EGARCH model is used to address this problem. The study showed that the effect of financial leverage is noticeable in the Kuwaiti and Moroccan indices. We conclude based on the results of the asymmetric GARCH family models, that market news has mixed effects on the MENA indices. The weak leverage effect confirms that MENA indices are more sensitive to market information.

Based on the above results, this paper presents some suggestions for investors in MENA indices. Firstly, MENA markets are not immune to such geopolitical shocks. Therefore, the MENA markets need to strengthen and develop their risk administrative systems. MENA markets are inefficient emerging markets, especially compared to developed markets. They are greatly affected by globalization and the rapid transfer of risks across countries. The design of a risk management control system can effectively reduce the risks of financial volatilities and thus reduce its impact on the MENA indices. Secondly, enforcing the law and activating the role of supervision and control over the market, especially with regard to legal violations. The disclosure of information must be expedited because the MENA indices are greatly affected by the current information. In addition, some markets were affected by negative news, such as Kuwait and Morocco. Thus, this leads investors to sell more stocks, causing large fluctuations in these indices. Rapid disclosure of information, credibility and transparency mitigate information asymmetry among listed companies. Examining the volatility of returns on the MENA indices helps us understand the actual economic process and provides an important insight for the government as decision makers and for investors as traders to realize the various risks.

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Measuring Jordan's Ability to Pay Its Public Debts

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ARTICLE INFO

ABSTRACT

Many developed and developing countries resort to internal and external borrowing for the purpose of using it to finance the deficit in the public budget, the deficit in the current balance (the trade deficit), or for other purposes. International standards have specified that the ratio of public debt to GDP should not exceed 60% for developing countries and more than that for developed countries. The optimal use of loans, such as using them in productive investment projects or reforming the country's infrastructure, increases national exports and the gross domestic product, and this would lead to a decrease in the deficit in the public budget and the current balance, and thus lead to decreasing debt or limiting its increase. This study main goal is to measure Jordan's ability to reduce or pay off its public debts by examining the impact of some of macroeconomic variables such as (public budget deficit, trade deficit private domestic investment and foreign reserves) on public debt for the period 1997-2019. The empirical results were depending on an autoregressive distributed lag (ARDL) bound approach of testing. The advantage of using ARDL model is to capture short – and long – run impacts. Empirical findings confirmed that economic growth, budget deficit, trade deficit and foreign reserves have positive effect on public debt, which means that an increase in these variables will lead to worsen public debt. While domestic private investment has a negative impact on public debt, which means an increase in domestic private investment leads to reduce public debt. Accordingly, the study found that Jordan's ability to repay or reduce its debts is weak. The study recommended that policy makers in Jordan should adopt an effective economic policies and procedures that will help to encourage domestic private investment, reduce the budget deficit, increase exports and reduce imports in order to reduce public debt.

INTRODUCTION

Public debt is one of the significant indicators upon which explaining the slowdown in economic growth after the financial crisis in 2008 and the European sovereign debt crisis depends. The rise in public debt is a source of concern for developing countries, especially Jordan, one of the developing countries with

limited economic and financial resources. Accordingly, the public debt has become a direct burden on its economy. The public debt in Jordan has doubled significantly during the period between 1997 and 2019, reaching about 5.912 billion dinars in 1997 to about 30.076 billion dinars in 2019, which represents 96% of the GDP. The public debt ratio in Jordan exceeded the global percentage and the permissible percentage in the Jordanian public debt law of 60%. World Bank studies confirmed that public debt threshold should not exceed 77% for a long time in developed countries and 64% for developing and emerging countries. Therefore, an arising in these percent leads to a deceleration in economic growth.

Jordan's total public debt is divided into external debt and domestic debt, where the government borrows from external sources such as banks, international financial and monetary institutions in addition to foreign countries. As for domestic borrowing, the government obtains it mainly through the national banking sector. Jordan's dependence on external borrowing was greater than its internal debt before 2008, as external borrowing amounted to 59% of total borrowing in 2007, while domestic borrowing amounted to 41% of total borrowing for the same year. Since 2008, Jordan started to depend more on domestic borrowing than external borrowing. Domestic debt reduces the weakness of the country facing external and domestic shocks and the implementation of a monetary policy facing periodic fluctuations. Therefore, the evidence is in favor of the domestic public debt, and this can be verified through the experience of developing countries such as China, India and Chile (Fseifes and Warrad 2020). It is expected that the Jordanian public debt will continue to rise during the coming period, as a result of the Jordanian government's announcement of agreeing on credits from the International Monetary Fund in the amount of $ 1.3 billion under the so-called "economic reform program" agreed upon between the two. The increase in debt will exacerbate the budget deficit due to the increase in interest and installments debts that Jordan must pay each year, and interest payments on public debt have increased from 12.3% of total domestic revenues in 2012 to 14% in 2018. Interest payments to public debt also increased from 9.4% of current spending to 13% during the same period, and the public debt interest paid by Jordan amounting to 1.5 billion dinars is a major reason for the deficit in the public budget (Jordan Strategy, 2019). Also, the debt increased at a rate of more than 90% annually during the period 2009-2019, which was the reason for the decline in growth in GDP at rates ranging between 5.2% -1.9%. International Monetary Fund indicated that the public debt in Jordan is still high and growth trends are decreasing during the twenty-year period when the public debt has increased. Some studies have showed that the increase in public debt generally and domestic debt particularly leads to a decline in investment as consequence of the government crowding out the private sector over the funds existed with local banks and financial organizations. On the contrary, public debt may be beneficial to a country if it uses borrowed money to finance projects and economic productive activities that would achieve economic development in the desired manner.

Thus, the main aim of this study is to shed light on Jordan's ability to pay its public debts by examining the effect of each of the economic growth rate, private budget deficit, trade deficit, private domestic investment, and foreign reserves on domestic debt, external debt and total debt in Jordan for the period 1997- 2019. The rest of the paper is set up as follows: section 2 illustrates the literature review; section 3 describes data and the econometric methodology. Section 4 gives a report about the study results. and the last section, section 5, appears the conclusions and recommendations.

1. LITERATURE REVIEW

The economic literature has ascribed the reasons for the increase in the state's public debt to three main factors, including: political, institutional, structural, and macroeconomic variables. A study done by Edwards and Tabellini (1991) on group of 21 LCDs, concluded that political instability and political polarization have a significant role in illustrating cross the differences of country especially in government borrowing and fiscal shortfalls. Their suggestion is that the large budget deficit is related to more politically unstable countries. In many cases, political instability leads to frequent government changes and thus reduces the possibility of re-election of the current policy maker, which may in turn negatively affect the economic policies currently taken.

Institutional and structural variables have great impact on public debt. Lavigne (2011) indicates that institutional stability such as the disappearing of government's corruption and quality of the bureaucracy

have a big influence on the public debt. Cooray et al. (2016) affirmed that a higher level of corruptions causes to a higher level of public debt. Also, it was a link between structural variables and the growth of public debt. Creel et al. (2012) argued that population ageing put upward pressures on government expenditures and public debt through age-related health care and public pension expenditures. Veiga and Veiga (2014) showed that expenditures structure and revenues has an effect on the level of public debt, and higher unemployment rates lead to a higher public debt levels. As for the macroeconomic aspect and its role in influencing the public debt, many countries often resort to borrowing money to finance their profit or service projects, such as financing infrastructure projects (i.e., roads, transportations, etc.), as well as human resource development projects (such as education, health, ... and others).

Some developed countries may resort to borrowing to finance their advanced social safety net programs such as social security insurance, unemployment insurance, health care and others to achieve economic, political, and social stability. Its indebtedness may increase due to the increase in its expenditures on these programs to avoid resorting to distorting tax fluctuations (Barro, 1979). Government borrowing allows governments to reduce the tax burden and redistribute it to future generations over time (Cukierman and Meltzer, 1989).

Since this empirical study focuses on the macroeconomic variables in determining Jordan' ability to pay off its large public debt, we will concentrate on reviewing some of the empirical studies introduced in the literature.

Reinhart and Rogoff (2010b) suggested that there is a probable bi-directional causality between debt and economic growth. They argue that high debt causes higher taxes and/or lower government spending, which affects negatively economic growth, while the duration of low growth may cause high deficits and accumulation of debt. Dereje (2013) used panel data for selected eight heavily indebted poor African countries to investigate whether external debt has any effects on economic growth. His study results confirm that external debt has an influence on economic growth through the debt crowding out effect rather than debt overhang. Al-Zeaud (2014) used OLS regression model to check the effect of public debt on the growth of economy for Jordan. The results showed that population growth and public debt have a significant positive impact on economic growth. Panizza and Presbitero (2014) apply an instrumental variable approach to test whether public debt has a causal effect on economic growth in a sample of OECD countries. They found that there is no evidence that public debt owning a causal impact on economic growth is significant regarding to the fact that the negative correlation between debt and growth is sometimes used to justifying policies that infer debt has a negative causal effect on economic growth.

Also, a study by Siddique et al. (2015) uses panel data for 40 highly indebted poor countries to analyze to what extent the external debt burden has an impact on a country's growth of GDP. Their results show that there is short and long run negative correlation between external debt and economic growth, which means that a reduction in external debt leads to an increase in the performance of economic growth in selected indebted countries. Huang et al. (2016) establish their results in three methods. First, local public debt is conversely correlated with the city-level investment ratio of domestic private manufacturing companies. Second, local public debt has a larger negative impact on investment by private companies in industries more dependent on external funding. Finally, in cities with high government debt, firm-level investment is more sensitive to internal funding, also when this sensitivity is estimated jointly with the firm's likelihood of being credit-constrained. Jacobo and Jalile (2017) test the impact of government debt on GDP in sixteen Latin American countries. The short-run impact of debt on GDP growth is positive, but beyond public debt-to-GDP ratios between 64 and 71% government debt to-GDP ratios would have a negative effect on economic growth. Gómez-Puig and Sosvilla-Rivero (2017) use ARDL Model to examine the short and long run impact of public debt on economic growth for eleven central and peripheral countries of the euro area (EA). The findings indicate a significant negative impact on the long-run performance of EA member states, but short-run influence may be positive depending on the country. A study by Lau et al. (2019) shows the existence of asymmetric effect of public debt on private investment in Malaysia by using non-linear autoregressive distributed lags (NARDL) estimation. Results appear some evidence of asymmetrical impact in private investment–public debt nexus in both the long- and short-run. There is evidence of long-run asymmetry between private investment and total public debt, external debt, and federal government debt. In the short run, asymmetric relationship exists between private investment and domestic debt, external debt, and federal government debt. The study concluded that higher public debt crowds out private

investment. Onafowora and Owoye (2019) use a structural vector autoregression generalized economic growth model to test the impact of external public debt-to-GDP ratio on per capita GDP growth, investment, trade openness, exchange rate, and inflation in Nigeria. The findings show that external debt has long-lived negative influences on economic growth and investment. Fseifes and Warrad (2020) examine the long-run corrolation between public debt and economic growth in Jordan using a fully modified ordinary least squares (FM-OLS) method. Findings appear an evidence of non-linearity between public debt and economic growth in the long-run, only with debt exceeding 78 percent of GDP. This result approves an inverted U-shaped curve in the debt-growth relationship in Jordan. In other words, the direction of the effect of public debt on economic growth converts smoothly from positive to negative depending on the debt level. Saungweme and Odhiambo (2020). The study uses autoregressive distributed lag (ARDL) technique to examine the impact of total public debt on economic growth and the relative impact of domestic and foreign public debt on economic growth in South Africa. The results suggest that there is a short and long run statistically significant negative impact of total public debt on economic growth. Moreover, the results confirm that domestic public debt and economic growth have positive correlation in the short run only. Furthermore, foreign public debt has a long-run negative effect on economic growth. Besnik Fetai et al. (2020) try to identify and determine the threshold values or the extent to which public debt-to-GDP ratio has a positive effect on economic growth, and beyond which point debt-to-GDP ratio has a negative effect on the economic growth in European transition countries. Their study uses different econometric models and techniques such as pooled OLS, fixed and random effects models, GMM (Generalized Method of Moments), and bootstrap method in order to determine threshold values of public debt-to-GDP ratio. The results show that at low level of public debt- to-GDP, ratio has a positive effect on economic growth, whereas beyond a certain turning point a negative effect on growth prevails in the European transition countries. Abd Rahman et al. (2019) examine whether there exists a mutual consent on the effects of public debt on the economic growth of a country or group of economies. The authors tackle thirty-three articles to be reviewed. They found that there is no mutual consent on the relationship between public debt and economic growth. The relationship can be positive, negative, or even non-linear.

Most of the previous studies tried to analyze the influence of public debt on economic growth in growing and developed countries alike. Therefore, they did not try to deal with measuring the extent of these countries' ability to pay their public debt. Thus, the objectives of this study are to identify the factors affecting the determination of Jordan's ability to pay its public debt by using new econometric techniques. The results and recommendations could help the government to take appropriate policy decisions to reduce its public debt and achieve desired economic growth.

The study's null hypotheses have been developed as follows:

- There is no statistically significant impact on the economic growth rate, budget deficit, trade deficit, domestic private investment, and foreign reserves on domestic debt.
- There is no statistically significant impact on the economic growth rate, budget deficit, trade deficit, domestic private investment, and foreign reserves on external debt.
- There is no statistically significant impact on the economic growth rate, budget deficit, trade deficit, domestic private investment, and foreign reserves on public debt.

2. DATA AND METHODOLOGY

2.1. Data

To evaluate the impact of macroeconomic variables on debt, the model consists of three dependent variables, which are domestic debt (DD), external debt (EX) and total debt (TOD) and five independent variables including: real GDP (RP), budget deficit (BD), trade deficit (TD), investment (I) and foreign reserves (FR). All variables are converted to natural logarithms. All variables are based on yearly data covering period from 1997 to 2019. Choosing this period span was based on the availability of accurate data. The data were obtained from the Central Bank of Jordan. The time series data descriptions and sources are provided in Table 1. Also, all the variables are depicted in Figure 1, and descriptive statistics for all variables are appeared in Table 1.
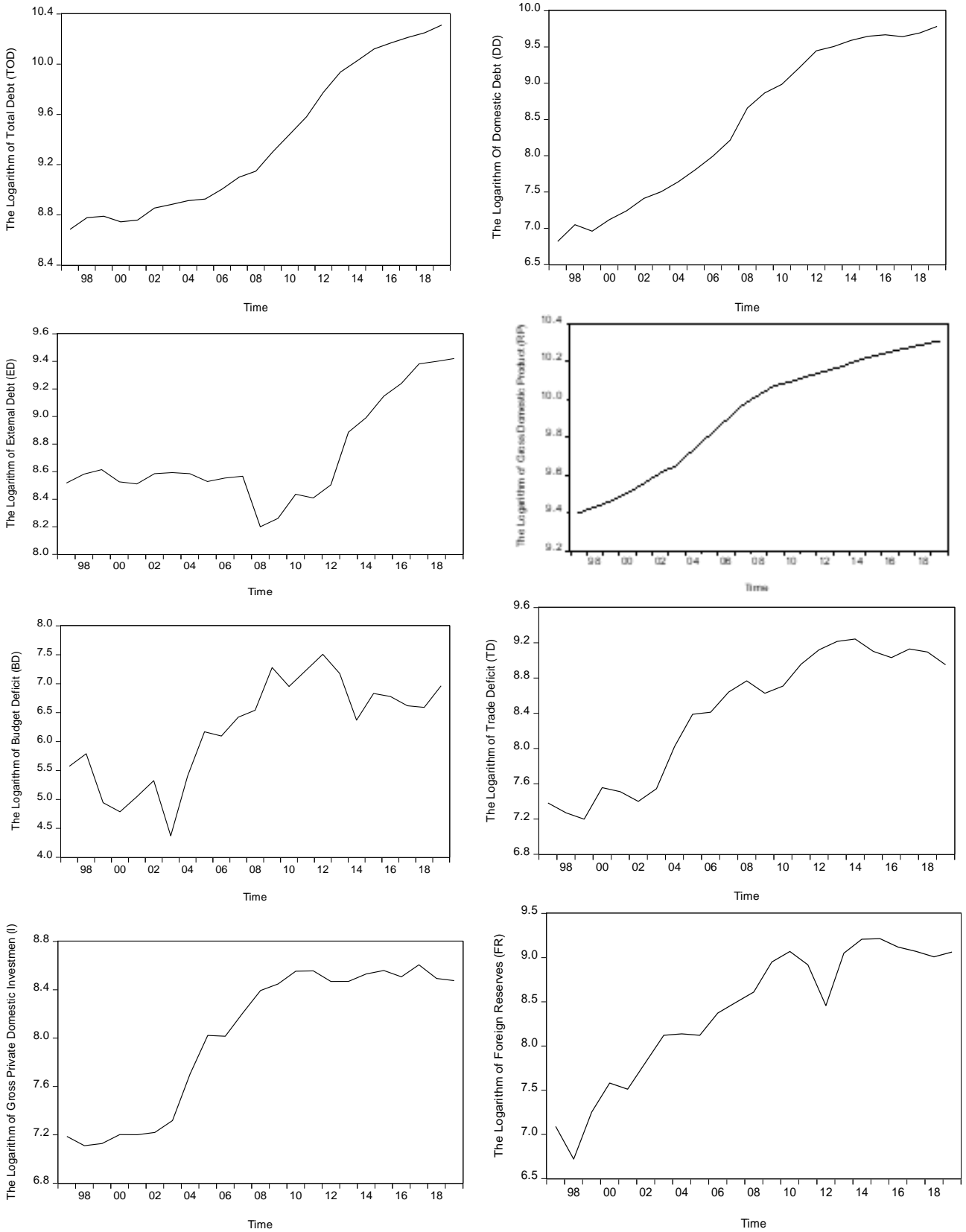
Figure 1. Plot of the Sample Series.

Source: Data from CBJ.

Table 1. Basic Data Descriptive Statistics

Variables Descriptive	LDD	LED	LTOD	LRP	LBD	LTD	LI	LFR
Mean	8.454	8.71	9.378	9.922	6.206	8.402	8.016	8.389
Maximum	9.783	9.42	10.31	10.31	7.508	9.242	8.605	9.213
Minimum	6.818	8.19	8.684	9.399	4.369	7.197	7.109	6.720
Std. Dev.	1.077	0.36	0.589	0.314	0.892	0.735	0.595	0.752

Source: own processing.

2.2. Methodology

The empirical estimation results for short-run and long-run relationship between debt and macroeconomics variables involved is based on Autoregressive Distributed Lag (ARDL)/bounds testing cointegration procedure. ARDL technique has some advantages such as: (i) it is a suitable technique for small sample size study (Pesaran et al., 2001); (ii) it is desirable technique when dealing with variables that are combined with different order, I(0), I(1) or combination of the both; (iii)) it gives unbiased estimates of the long-run model and valid statistics even when some of the regressors are endogenous (Harris and Sollis, 2003).

This study divides the empirical works to three main groups: first, the impact of the independent variables mentioned above on the domestic debt; second, the impact of the independent variables on the external debt; and third, the impact of independent variables on the total debt.
The following three ARDL base models will be estimated to check if there is any significant evidence of long-run relationship among the variables included in this study.

$$\Delta lnDD_t = a_0 + \alpha_1 LnDD_{t-1} + \alpha_2 LnRP_{t-1} + \alpha_3 LnBD_{t-1} + \alpha_4 LnTD_{t-1} + \alpha_5 LnI_{t-1} + \alpha_6 LnFR_{t-1} + \sum_{i=0}^{n} \beta \Delta LnDD_{t-i} + \sum_{i=0}^{n} \gamma \Delta LnRP_{t-i} + \sum_{i=0}^{n} \delta \Delta LnBD_{t-i} + \sum_{i=0}^{n} \varphi \Delta LnTD_{t-i} + \sum_{i=0}^{n} \rho \Delta LnI_{t-i} + \sum_{i=0}^{n} \pi \Delta LnFR_{t-i} + \mu_t \quad (1)$$

$$\Delta lnED_t = a_0 + \alpha_1 LnED_{t-1} + \alpha_2 LnRP_{t-1} + \alpha_3 LnBD_{t-1} + \alpha_4 LnTD_{t-1} + \alpha_5 LnI_{t-1} + \alpha_6 LnFR_{t-1} + \sum_{i=0}^{n} \beta \Delta LnED_{t-i} + \sum_{i=0}^{n} \gamma \Delta LnRP_{t-i} + \sum_{i=0}^{n} \delta \Delta LnBD_{t-i} + \sum_{i=0}^{n} \varphi \Delta LnTD_{t-i} + \sum_{i=0}^{n} \rho \Delta LnI_{t-i} + \sum_{i=0}^{n} \pi \Delta LnFR_{t-i} + \mu_t \quad (2)$$

$$\Delta lnTOD_t = a_0 + \alpha_1 LnTOD_{t-1} + \alpha_2 LnRP_{t-1} + \alpha_3 LnBD_{t-1} + \alpha_4 LnTD_{t-1} + \alpha_5 LnI_{t-1} + \alpha_6 LnFR_{t-1} + \sum_{i=0}^{n} \beta \Delta LnTOD_{t-i} + \sum_{i=0}^{n} \gamma \Delta LnRP_{t-i} + \sum_{i=0}^{n} \delta \Delta LnBD_{t-i} + \sum_{i=0}^{n} \varphi \Delta LnTD_{t-i} + \sum_{i=0}^{n} \rho \Delta LnI_{t-i} + \sum_{i=0}^{n} \pi \Delta LnFR_{t-i} + \mu_t \quad (3)$$

Where, Δ is first difference operator, α_i are the long run multipliers, a_0 is the intercept and μ_t is white noise error term.

The cointegration test finding for the long-run relationship using ARDL model includes performing the F test on the null hypothesis: H_0: $\alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 = \alpha_6 = 0$.

The existence of long-run relationship between variables depends on the value of F-Bound testing result. If the result shows that a computed F-statistic value is bigger than upper critical bounds value, then the long-run relationship between variables is accepted. If the result of computed F-statistic value is less than the lower critical bounds value, then no long-run relationship between variables is accepted. If the result of computed F statistic value is between upper and lower critical value, then the decision regarding long-run relationship is inconclusive.

The study paper also uses the unrestricted error correction version of ARDL approach to analyze the short-run effect by appreciating the following equations:

$$\Delta LnDD_t = \alpha_1 + \sum_{i=1}^{n} \beta \Delta LnDD_{t-i} + \sum_{i=0}^{n} \gamma \Delta LnRP_{t-i} + \sum_{i=0}^{n} \delta LnBD_{t-i} + \sum_{i=0}^{n} \varphi LnTD_{t-i} + \sum_{i=0}^{n} \rho \Delta LnI_{t-i} + \sum_{i=0}^{n} \pi \Delta LnFR_{t-i} + \psi ECM_{t-1} + \mu_t \quad (4)$$

$$\Delta LnED_t = \alpha_1 + \sum_{i=1}^{n} \beta \Delta LnED_{t-i} + \sum_{i=0}^{n} \gamma \Delta LnRP_{t-i} + \sum_{i=0}^{n} \delta LnBD_{t-i} +$$
$$\sum_{i=0}^{n} \varphi LnTD_{t-i} + \sum_{i=0}^{n} \rho \Delta LnI_{t-i} + \sum_{i=0}^{n} \pi \Delta LnFR_{t-i} +$$
$$\psi ECM_{t-1} + \mu_t \qquad (5)$$

$$\Delta LnTOD_t = \alpha_1 + \sum_{i=1}^{n} \beta \Delta LnTOD_{t-i} + \sum_{i=0}^{n} \gamma \Delta LnRP_{t-i} + \sum_{i=0}^{n} \delta LnBD_{t-i} +$$
$$\sum_{i=0}^{n} \varphi LnTD_{t-i} + \sum_{i=0}^{n} \rho \Delta LnI_{t-i} + \sum_{i=0}^{n} \pi \Delta LnFR_{t-i} +$$
$$\psi ECM_{t-1} + \mu_t \qquad (6)$$

Where $\beta, \gamma, \delta, \varphi, \rho, \pi$ are the short-run dynamic coefficients of the model's convergence to equilibrium, ψ is the speed of adjustment and ECM_{t-1} is the error correction term and measuring the deviations of $InDD_t$, $InED_t$, $InTOD_t$ from their long-run values.

3. EMPIRICAL RESULTS AND ANALYSIS

This part represents three experimental analyses for the impact of economic growth, budget deficit, trade deficit, investment, and foreign reserves on domestic, external, and total debt. We will start with domestic debt analysis and move to external debt analysis and, finally, total debt analysis.

3.1 Unit Root Test

Before proceeding further, we need to examine time series data used in this analysis for stationarity. Therefore, unit root tests were used to test for stationarity. The findings were based on two tests: first one is the augmented Dickey-Fuller (AD-F) test and the second one is Phillips-Perron unit root test. The results shown in Table (2) confirmed that all variables included in this study are non-stationary in their level form, but they are stationary in their first difference form. This means that all variables are integrated of order one I (1). Based on these findings and since our study's sample is small set chosen ARDL model will be the right and an appropriate econometric technique to discover short-and long-run relationship between dependent variable and independent variables under this study.

Table 2. Results for Unit Root Test

Variables	ADF		PP		Order of integration
	Level				
	Intercept	With Trend	Intercept	With Trend	
LDD	-0.716	-2.710	-1.021	-0.834	I(1)
LED	0.243	-0.928	0.243	0.991	I(1)
LTOD	0.204	-2.501	0.633	-1.770	I(1)
LRP	-2.314	-1.367	-1.709	-0.244	I(1)
LBD	-1.182	-2.385	-1.129	-2.162	I(1)
LTD	-1.384	-0.005	-1.198	-0.850	I(1)
LI	-1.218	0.348-	-1.185	-0.740	I(1)
LFR	-1.553	-1.819	-2.507	-1.474	I(1)
	First Difference				
ΔLDD	-3.236**	-3.231**	-3.270**	-3.341***	-
ΔLED	-3.676**	-4.053**	-3.651**	-4.045**	-
ΔLTOD	-2.995***	-3.451***	-3.001***	-3.457***	-
ΔLRP	-2.890***	-7.259*	-2.885***	-3.554***	-
ΔLBD	-5.182*	-5.040*	-5.182*	-5.040*	-
ΔLTD	-3.776**	-4.052**	-3.354**	-3.713**	-
ΔLI	-3.083**	-3.421***	-3.083**	-3.421***	-
ΔLFR	-5.473*	-4.223**	-5.532*	-17.109*	-

Notes: *, ** and *** indicate 1%, 5% and 10% significance levels respectively. Δ is first difference.

Source: own processing.

3.2 Domestic Debt Model Analysis

This part discusses empirical analysis for equations (1 and 4).

3.2.1 Cointegration Test

Based on Akaike Information Criterion (AKC), a maximum 1 lag is picked for the conditional ARDL model in base model in equation (1). The results for equation (1), which investigates the existence of long-run cointegration correlation between domestic debt, economic growth, budget deficit, trade deficit, investment and foreign reserves is reported in table 3. Since the value of computed F-statistic (8.527) surpasses the upper bound 6.37 at 1 significant percent level, this will confirm the existence of the long-run correlation among variables mentioned in equation 1.

Table 3. Cointegration Test Result Based on ARDL Bounds Test. (LDD)

F- Bounds Test	1% Critical Value		5% Critical value		10% Critical value	
F- Statistic = 8.527	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
	4.537	6.37	3.125	4.608	2.578	3.858

Note: Calculated F-statistic based on Wald test = 8.527. The critical values are obtained from Perasan et al. (2001), Table CI (III), p. 300, case III: unrestricted intercept and no trend with n = 50.

Source: own processing.

3.2.2 Long- run Analysis

The long-run relationship estimated coefficients are presented in Table 4. Results show that real GDP, budget deficit, trade deficit and foreign reserves have a highly significant positive influence on domestic debt, while the study's result shows that there is a very significant negative impact of investment on domestic debt. For the economic growth, the impact is significant at 1 percent level in which an increase in GDP by 1% leads to increasing domestic debt by 2.0%. For the budget deficit, trade deficit and foreign reserves an increase in 1% in any of them leads to an increase in domestic debt by about 0.20%, 0.75% and 0.30% respectively. As for investment, an increase in investment by 1% leads to a decline in domestic debt by about 1%.

Table 4. The Long-Run Relationship Estimated Coefficients, of ARDL Model, Based on AIC (1,1,0,1,1,1). Dependent variable is LDD

Variable	Coefficients	t-ratio	P- value
LGDP	2.021	4.831*	0.001
LBD	0.195	3.384*	0.005
LTD	0.746	5.294*	0.000
LI	-1.003	-4.367*	0.001
LFR	0.329	2.908**	0.014
INTERCEPT	-13.392	-4.907*	0.000

Note * Significant at 1%, ** Significant at 5%.

Source: own processing.

3.2.3 Short-run Analysis

The short-run dynamic findings of the impact of economic growth, budget deficit, trade deficit, investment and foreign reserves on domestic debt are described in table 5. Findings show that budget deficit, trade deficit and foreign reserves have positively significant short-run effects on domestic deficit. An increase in budget deficit, trade deficit and foreign reserves by 1% causes an increase in domestic debt by about 0.15%, 0.38% and 0.18% respectively, while economic growth and investment have negatively significant effects on domestic debt. Results show that an increase in economic growth and investment by 1% leads to decreasing domestic debt by about 5.6% and 0.40% respectively. Table 5 also appears the equilibrium error correction coefficient (ECM) which is estimated about -0.85, and it is highly statistically significant at 1 percent level, with the correct sign (negative sign). The ECM (-1) measures the pace of adjustment to equilibrium after one shock. Result confirms that 85 percent of disequilibria from the previous year's shock converge back to the long-run equilibrium in the current year. Results of residual diagnostic tests such as normality, serial correlation and heteroscedasticity are reported in Table 5. Results affirmed that they performed very well. The stability test such as cumulative sum of recursive residual (CUSUM) is conducted to check the stability of the goodness of fit for ARDL model and it is reported in Figure 2. The result shows that the model is stable. R-squared result is also reported in table 5, which is a measure of fit that points how much of the independent variables could explain the variation of dependent variable in a regression model. The R-squared result reveals that 88% of the data fit the regression model.

Table 5. Error Correction Representation for the ARDL Model – Selected Based on AIC (1,1,0,1,1,1). Dependent Variable is DLDD.

Variables	Coefficients	t-ratio	P- value
DLRP	-5.625	-4.631*	0.000
DLBD	0.163	5.372*	0.000
DLTD	0.382	4.310*	0.000
DLI	-0.397	-2.890*	0.014
DLFR	0.115	2.342**	0.039
INTERCEPT	-11.377	-8.601*	0.000
ECM (-1)	-0.847	-8.627*	0.000
Cointegrating equation $LDD_t = -13.39 + 2.02LRP_t + 0.19LBD_t + 0.74LTD_t - 1.00LI_t + 0.32LFR + \varepsilon_t$ T-Ratio[Prob] -4.90* [0.00] 4.83* [0.00] 5.372* [0.00] 4.310* [0.00] -4.367* [0.00] 2.908** [0.014]			
R-square	0.880		
Adjusted R-square	0.771		
DW	2.350		
Residual Diagnostic tests for the estimated model			
Serial Correlation of Residuals F- Statistic	2.145 p-value [0.177]		
Normality J-B Value	0.345 p-value [0.841]		
Heteroscedasticity Test of Residuals	0.063 p-value [0.803]		

Note: * Significant at 1%, ** Significant at 5%.
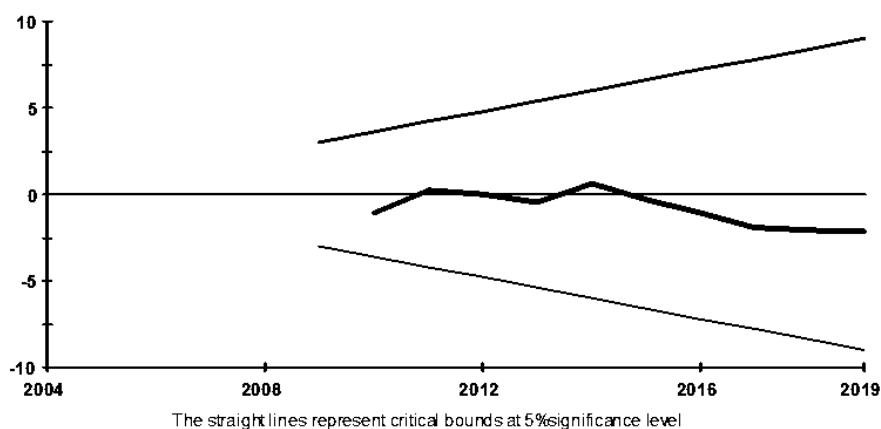
Source: own processing.

The straight lines represent critical bounds at 5% significance level

Figure 2. Plot of Cumulative Sum of Recursive Residuals.

Source: own processing.

The above-mentioned analyses regarding long-run results indicated that an increase in the economic growth, budget deficit, trade deficit and foreign reserves will not result in a decrease in the demotic debt in Jordan. Rather, the increase in these variables required more domestic debt for the purpose of financing them, which means that Jordan's strength is represented in a real increase in the domestic product and a decrease in the budget deficit, and the trade balance will not contribute to reducing the domestic debt in Jordan. Short-run results came the same as long-run results. An increase in domestic debt was associated with an increase in budget and trade deficits and foreign reserves, which means that the increase in domestic debt was used to finance government expenditures as well as imports. The increase in foreign reserves in Jordan may have played a significant role in encouraging financial institutions and the private sector in increasing the government's opportunity to obtain more loans. As for the negative short-run effect of real GDP and investment on domestic debt, the results are consistent with economic logic: an increase in investment and real GDP leads to an increase in the ability of Jordan to pay off and reduce its domestic debt.

3.3 External Debt Model

This part presents an empirical analysis for equations (2 and 5).

3.3.1 Cointegration Test

Based on Akaike Information Criterion (AKC), a maximum 1 lag is chosen for the conditional ARDL model in equation (2). Equation (2) investigates the existence of long-run cointegration correlation between domestic debt, economic growth, budget deficit, trade deficit, investment, and foreign reserves. Results shown in table 6 show that the value of computed F-statistic is 2.00 less than lower bound 2.578 at 10 significant percent level. This will confirm that there is no long-run corrolation between variables included in equation 2.

Table 6. ARDL Bounds Test for the Existence of Cointegration. (LED)

F- Bounds Test	1% Critical Value		5% Critical value		10% Critical value	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
F- Statistic = 2.00	4.537	6.37	3.125	4.608	2.578	3.858

Note: Calculated F-statistic (Wald test) = 2.00. The critical values are obtained from Pesaran et al. (2001), Table CI (III), p. 300, case III: unrestricted intercept and no trend with n = 30.

Source: own processing.

46

3.3.2 Long- run Analysis

The coefficients estimated of the long-run relationship is presented in table 7. Results show that real GDP, budget deficit, trade deficit, investment and foreign reserves do not have any significant impact on external debt.

Table 7. The Long-Run Relationship Estimated Coefficients of ARDL Model, Based on AIC (1,0,1,0,0,0). Dependent variable is LED

Variable	Coefficients	t-ratio	P- value
LRP	5.7293	1.1916	.253
LBD	-2.9156	-.63886	.533
LTD	-2.3547	-.52960	.605
LI	8.0361	-.66124	.519
LFR	-3.7833	-.66124	.519
INTERCEPT	-43.4083	-.92226	.372

Source: own processing.

3.3.3 Short-run Analysis

The short-run dynamic findings of the impact of economic growth, budget deficit, trade deficit, investment and foreign reserves on external debt are reported in table 8. Results show that budget deficit and foreign reserves have a positively significant short-run impacts on external debt. Budget deficit effect on external debt is significant at 5 percent level, but foreign reserves effect is significant at 10 percent level, which is somehow weak. An increase in budget deficit by 1% leads to increase in external debt by about 0.23 %, while an increase in foreign reserves by 1% leads to increase in external debt by about 0.43%. Regarding the impact of investment, results show that effect is negative, and it is statistically significant at 5 percent level. An increase in investment by 1% leads to a decrease in external debt by 0.90%. As for the short-run impact of economic growth and trade deficit on external debt, results confirm that there are no significant impacts.   Table 8 also reports the equilibrium error correction coefficient (ECM). The result shows the sign of the coefficient is positive instead of negative and statistically insignificant. Diagnostic tests for the residual of the regression model specification such as normality, serial correlation and heteroscedasticity are also reported in Table 8. All diagnostic Tests results for the residuals are performed very well. The cumulative sum of recursive residual (CUSUM) to check for the stability of ARDL model is shown in Figure 3. The result indicates that the model is stable. The R-squared result reveals that 79% of the data fit the regression model.

Table 8. Error Correction Representation for the ARDL Model – Selected Based on AIC (1, 0,1, 0,0,0). Dependent Variable is DLED

Variable	Coefficients	t-ratio	P- value
DLRP	-0.643	-0.583	0.568
DLBD	0.229	2.212**	0.047
DLTD	0.264	1.226	0.239
DLI	-0.902	-2.602**	0.020
DLFR	0.425	1.852***	0.088
ECM (-1)	0.112	0.529	0.605
R-square	0.787		
Adjusted R-square	0.766		
DW	2.191		
Residual Diagnostic tests for the estimated model			
Serial Correlation of Residuals F- Statistic	0.438 p-value [0.519]		

Normality J-B Value	1.265 p-value [0.255]		
Heteroscedasticity Test of Residuals	0.238 p-value [0.631]		

Note: ** Significant at 5%, *** Significant at 10%.

Source: own processing.

The straight lines represent critical bounds at 5%significance level
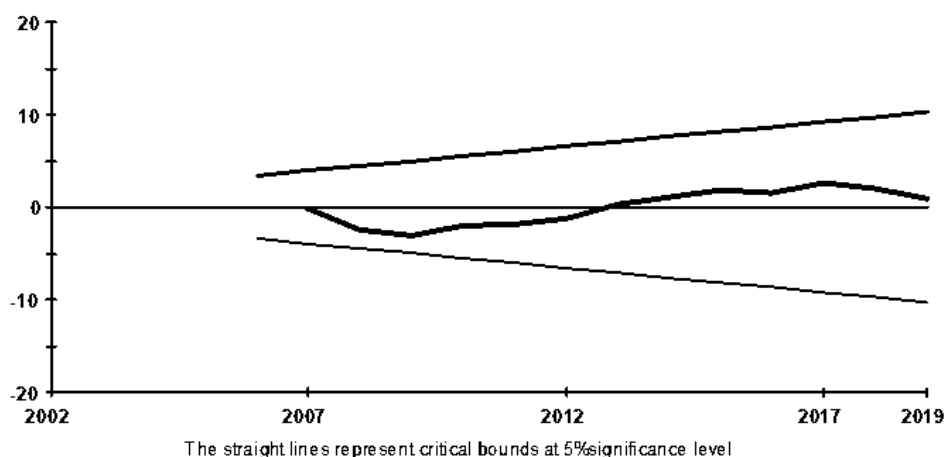
Figure 3. Plot of Cumulative Sum of Recursive Residuals.

Source: own processing.

The above-mentioned analyses regarding the impacts of independent economic variables included in this study on external debt in the long– and short– run show: first regarding long–run impacts, results indicated that there are no significant effects of all independent economic variables included in the model on external dept. Second, regarding short– run impacts, results indicate that the economic growth did not play any significant role in reducing external debt; trade deficit does not have any impact on external debt; budget deficit and foreign reserves have significant impact on increasing external debt, which means that Jordan's government used increased external debt to finance government expenditures. The increase in foreign reserves in Jordan may have played a significant role in encouraging international financial institutions in increasing the government's opportunity to obtain more loans. Results also indicated that investment is the only variable with a major role in reducing external debt.

3.4 Total Debt Model

This part discusses empirical analysis for equations (3 and 6).

3.4.1 Cointegration Test

Based on Akaike Information Criterion (AKC), a maximum 1 lag is chosen for the conditional ARDL model in equation (3). Equation (3) investigates the existence of long-run cointegration relation between total debt, economic growth, budget deficit, trade deficit, investment and foreign reserves. Results reported in Table 9 show that the value of calculated F-statistic is 14.62, which considers greater than the upper bound 6.37 at 1 significant percent level. This result affirms that there is long-run relationship among variables included in equation 3.

Table 9. ARDL Bounds Test for the Existence of Cointegration. (LTOD)

F- Bounds Test	1% Critical Value		5% Critical value		10% Critical value	
F- Statistic =	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
14.620	4.59	6.368	3.276	4.63	2.752	3.994

Note: Calculated F-statistic (Wald test) = 14.620. The critical values are obtained from Pesaran et al. (2001), Table CI (III), p. 300, case III: unrestricted intercept and no trend with n = 50.

Source: own processing.

3.4.2 Long- run Analysis

The long-run relationship estimated coefficients for equation 3 is reported in Table 10. Findings appear that real GDP and trade deficit do not have any long-run effect on total debt, while budget deficit and foreign reserves have significant positive effects on total debt. Results show that an increase in budget deficit by 1% increases total debt by 1.81%. Regarding GDP and trade deficit, results show no long-run effects on total debt. Investment effect on total debt was the most significant variable. The results show that there is a negative significant long-run impact of investment on total debt. The coefficient indicates that an increase in investment by 1% decreases total debt by about 4.55 %. Results for foreign reserves show positive impact on total debt, but they are significant at 10% level.

Table 10. The Long-Run Relationship Estimated Coefficients of ARDL Model, based on AIC (1,0,1,0,1,1). Dependent variable is LTOD

Variable	Coefficients	t-ratio	P- value
LRP	2.142	1.324	0.210
LBD	1.808	2.434**	0.032
LTD	0.501	1.121	0.284
LI	-4.547	-2.818**	0.016
LFR	1.422	1.818***	0.094
INTERCEPT	-2.131	-0.182	0.859

Note ** Significant at 5%, *** Significant at 10%.

Source: own processing.

3.4.3 Short-run Analysis

The short-run dynamic analysis results came the same as long-run results for all variables (economic growth, budget deficit, trade deficit, investment, and foreign reserves). Table 11 reports these short-run results. As for economic growth and trade deficit, results show that there is no significant impact of both variables on total debt. Results show that budget deficit and foreign reserves have positive and significant short-run effects on total debt deficit. Budget deficit impact on external debt is significant at 5 percent level, but foreign reserves effect is significant at 10 percent level, which is somehow weak. An increase in budget deficit by 1% causes to an increase in external debt by about 0.11 %, while an increase in foreign reserves by 1% causes to an increase in external debt by about 0.06%. Concerning the effect of investment on total debt, results show that the impact is negative, and it is statistically significant at 5 percent level. An increase in investment by 1% leads to a decrease in external debt by 0.31%. For the short-run effect of economic growth and trade deficit on external debt, results show that there are no significant effects. Table 11 also reports the equilibrium error correction coefficient (ECM). The result shows the sign of the coefficient is negative and statistically significant at 5% level. Diagnostic tests for the residual of the regression model specification such as normality, serial correlation and heteroscedasticity are also reported in Table 11. All diagnostic Tests results for the residuals are performed very well. The cumulative sum of recursive residual (CUSUM) to check for the stability of ARDL model is shown in Figure 4. The result indicates that the model is stable. The R-squared result reveals that 90% of the data fit the regression model.

Table 11. Error Correction Representation for the ARDL Model – Selected Based on AIC (1,0, 1,0, 1,1). Dependent Variable is DLTOD.

Variable	Coefficients	t-ratio	P- value
DLRP	0.222	1.001	0.333
DLBD	0.115	5.100*	0.000
DLTD	0.052	1.164	0.262
DLI	-0.314	-3.580*	0.003
DLFR	0.058	2.035**	0.050
ECM (-1)	-0.103	-2.734**	0.015
Cointegrating equation $LTOD_t$ = -2.31+ 2.14LRP_t + 1.80LBD_t +0.50TD_t - 4.54LI_t +1.42LFR+ ε_t T-Ratio[Prob] -0.18[0.86] 1.32[0.21] 2.43**[0.03] 1.12[0.28]-2.81**[0.01] 1.82***[0.94]			
R-square	0.899		
Adjusted R-square	0.823		
DW	2.55		
Residual Diagnostic tests for the estimated model			
Serial Correlation of Residuals- F- Statistic	1.748 p-value [0.213]		
Normality J-B Value	0.821 p-value [.663]		
Heteroscedasticity Test of Residuals	0.578 p-value [.456]		

Note: * Significant at 1%, ** Significant at 5%.

Source: own processing.

The straight lines represent critical bounds at 5% significance level
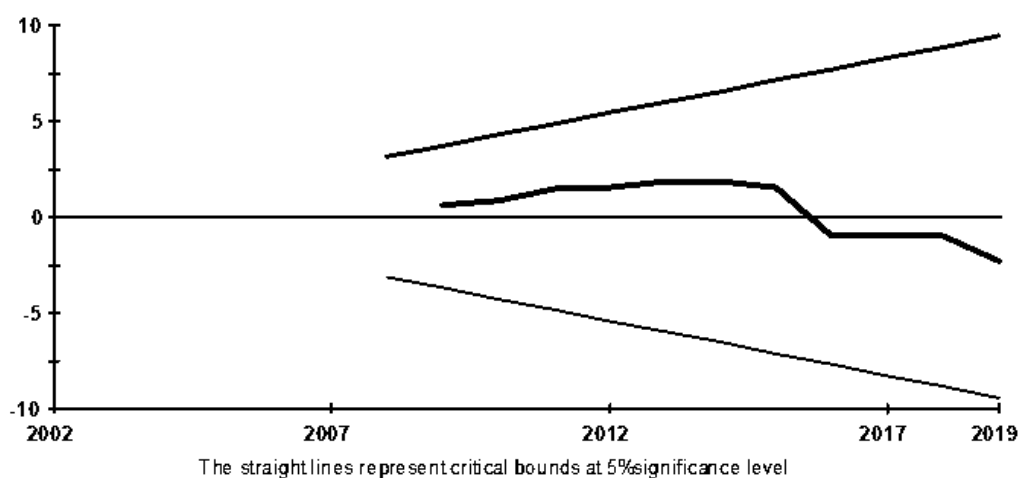
Figure 4. Plot of Cumulative Sum of Recursive Residuals.

Source: own processing.

The analyses mentioned above based on the impact of independent economic variables involved in this study on total debt (in the long and short run) appears that: the growth of the economy did not play any role in reducing total debt; trade deficit does not have any role in increasing or decreasing total debt; budget deficit and foreign reserves played major role in increasing total debt for the reasons mentioned early; and investment was the main factor in reducing total public debt.

CONCLUSIONS

The major goal of this study is to determine the extent of Jordan's ability to pay off its debts by using ARDL model during the 1997-2019. The findings of all regression's analyses are as follows:

- Lon-run relationships clear in all analysis except in section 4.2 which is relevant to the log-run relationship between all independent variables involved in this study and dependent variable (external debt).
- The most significant variable that appears to have a significant long – and short – run positive impact on domestic, external and total debt is the budget deficit. This means budget deficit causes more debt, except the long-run relationship in the model of section 4.2 since the result does not show any significant long-run relationship between all independent variables (GDP, budget deficit, trade deficit, investment and foreign reserve) and dependent variable (external debt).
- The most significant variable which appears to have a significant long – and short – run negative impact on debt (domestic, external and total debt) is investment. This means that an increase in investment causes domestic, external and total debt to fall, except long-run relationship in section 4.2 since the result does not show any significant long-run relationship in the analyses.
- Trade deficit has a significant positive long- and short – run impact on domestic debt only. This means that an increase in trade deficit leads to an increase in domestic debt.
- Economic growth has a significant positive long-run effect on external debt and total debt. Also, it has a significant positive short-run impact on total debt only. But regarding results found in domestic debt model, economic growth has a significant negative short-run impact on domestic debt.
- Foreign reserve has a significant positive long-run effect on domestic and total debt, and it has a significant positive short-run effect on domestic, external, and total debt. This means that an increase in foreign reserve causes an increase in debt.
- All Diagnostic tests for the residual and stability in all models were checked, results confirm that the models are stable and performed well.
- In general, domestic investment is the only variable that participates in reducing debt. On the other side, foreign reserve, trade, and budget deficits participate in increasing debt. Economic growth does not play any role in reducing the eternal debt in the long-run, but it does reduce domestic debt in the short-run.

RECOMMENDATIONS

Based on the findings of this study, we suggest some recommendations that we believe will help in reducing debt in Jordan:

- Emphasis on increasing domestic investment in Jordan due to its positive impact in reducing debts. This could be done by adopting a strategy to make the savings growth rate grow at a pace commensurate with the required increase in investment.
- The necessity of adopting a government plan to reduce the percentage of debts to the domestic product over time. This could be done by the use of public debt to increase investment and achieve higher economic growth.
- Developing a strategy to stimulate and increase the growth rate of national exports at a rate more than the growth rates of imports in order to reduce the trade balance deficit and thus reduce debts.
- The need for the government to reduce the budget deficit in order to decrease debts. This could be done by putting pressure on non-productive expenditures.
- Allocating an annual margin from foreign reserves to pay off the debt burdens, which could be sufficient to reduce the debt over time without affecting the domestic liquidity of money.

Future experimental studies may focus on the impact of the institutional and structural factors on public debt in Jordan.

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Key Factors Affecting the Profitability of Commercial Banks during the Covid-19 in Vietnam

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ARTICLE INFO

ABSTRACT

From 2019 to now, the world economy, including Vietnam, has been seriously affected by the Covid-19 pandemic. The paper's main idea showed that the complicated and prolonged Covid-19 epidemic is causing many adverse effects on all economic and social aspects, including the banking industry. The implementation of social distancing to prevent and control the Covid-19 epidemic has partly influenced enterprises' production and business processes and reduced commercial banks' profitability. However, thanks to the promotion of digitization, the operation of credit institutions currently maintains stability, ensuring smooth and safe transactions and bringing profits. Data collection methods: the author collected data from 25 commercial banks listed on the stock exchange from 2009 to 2020 and 300 observations (balanced panel data) extracted from websites and the General Statistics Office of Vietnam. The subject and the goal of the research analyzed vital factors affecting the profitability of commercial banks and the impact Covid-19 epidemic on the profitability of commercial banks listed on the Vietnam stock market. Besides, the author used the method applied to the models analyzed quantitatively through regression to select the appropriate model, the generalized method of moments (SGMM) system. The research findings showed the business profitability of commercial banks in the context of the Covid-19 epidemic, and eight hypotheses were accepted with a 5% significance level. Finally, the research results gave management implications to enhance the profitability of commercial banks in Vietnam. Besides, the study value helps the Government and State Bank are not immune to adverse impacts, and several recommendations have been proposed to overcome these harmful effects.

INTRODUCTION

In this context, the Covid-19 pandemic is still complicated and unpredictable, causing significant impacts on Vietnam's economy, society, and commercial Banks. At the beginning of 2020, Vietnam witnessed unprecedented changes in decades due to the effects of the Covid-19 pandemic (Adegboye et al., 2020). The economy was severely affected by the stagnation of production and business, and many socio-cultural

activities were also seriously affected. Enterprises face the problem of declining operations and reducing cash flow, especially in tourism, entertainment, automobiles, and retail. Millions of workers are short of or unemployed, a profound drop in income. Liquidity problems for households and businesses, coupled with increasing instability, have negatively impacted financial market performance, and this has also increased the risk of overdue debt for bank loans (Kumar & Bird, 2022). Therefore, the operation of the banking system is not immune to negative impacts.

Profitability is essential for banks to innovate and diversify products, effectively doing business (Khalfaoui & Derbali, 2021; Ramlan & Adnan, 2016). Besides, profitability is one of the critical measures to evaluate the financial results of commercial banks, considered based on a combination of business results and used resources. Therefore, assessing banks' profitability and considering influencing factors is not a new topic but has always been of interest to researchers, banking administrators, and executives. However, most previous studies often include the model while considering internal, industry, and macro factors. In particular, studies on the profitability of Vietnamese commercial banks had corporate governance factors. This study analyzes data related to Vietnamese commercial banks from 2009 to 2020. Hence, the general environment of the banking industry and macroeconomic conditions among the surveyed banks are the same. They did not include industry and macro variables in the research model as previous studies did.

1. LITERATURE EMPIRICAL REVIEW

1.1 Return on assets (ROA)

Return on Assets (ROA) - known as the return on assets ratio, is an indicator that shows the correlation between a company's profitability compared to its assets. ROA tells us how efficiently a company uses its assets to profit (Garza-Garcia, 2012). The profitability analysis is a research process to evaluate the entire process and efficiency of business activities at the bank to clarify the quality of business activities and potential sources of income potential to be exploited. Propose plans and solutions to improve business profitability (Duraj & Moci, 2015).

1.2 The ratio of operating expenses to assets (OE)

Operating expenses include personnel costs, administrative management, depreciation, etc. This ratio evaluates the cost control of the bank. If this variable is higher, the bank's cost control is not reasonable, reducing efficiency (Eljelly, 2013). Optimizing operations, controlling costs well, and generating more revenue per dollar are increasingly effective indicators for banks(Athanasoglou et al., 2008). The control, reduction, and effective use of costs also play an essential role in the overall results achieved. Thus, the author gave hypothesis H1 below:

Hypothesis H1: There is a negative relationship between operating expenses to assets (OE) and return on assets (ROA).

1.3 Logarithm of total assets (SIZE)

This independent variable reflects the size of the bank, as the larger the size of the bank, enabling them to be equipped with more modern technology to be able to diversify services. Research results showed that income diversification negatively affects profitability (Albertazzi & Gambacorta, 2009). Therefore, this study also predicts that SIZE harms the dependent variable. Thus, the author gave hypothesis H2 following:

Hypothesis H2: There is a negative relationship between total assets (SIZE) and return on assets (ROA).

1.4 Liquidity ratio (LIQ)

Liquidity is an essential group of financial metrics used to determine a debtor's ability to repay a debt in the short term without raising external capital (Eyup et al., 2017; Tan & Floros, 2012). Liquidity ratios are an essential group of financial metrics used to determine a debtor's ability to repay a debt in the short term without raising external capital (Bougatef, 2017). The liquidity ratio measures a company's ability to meet its debt obligations and margin of safety by calculating metrics including current ratio, quick ratio, operating cash flow ratio high liquid asset to deposit ratio. Thus, the author gave hypothesis H3 following:

Hypothesis H3: There is a negative relationship between liquidity ratio (LIQ) and return on assets (ROA).

1.5 Leverage ratio (LEV)

The bank's leverage factor, represented by the leverage ratio, has a close relationship with the bank's capital adequacy (Linares-Mustarós et al., 2018). The greater the potential risk for banks with higher leverage, this factor requires the bank to have enough capital to cover potential losses without affecting creditors. Banks with high power are riskier than other banks, and shareholders will require an increase in profit ratio, resulting in increased leverage and having difficulty raising equity capital due to high capital costs. Therefore, the bank's leverage ratio and ROA inverse relationship (Mehta & Bhavani, 2017; Arellano, 2002). The study expects LEV to affect the profitability of commercial banks negatively. The author gave hypothesis H4 following:

Hypothesis H4: There is a negative relationship between leverage ratio (LEV) and return on assets (ROA).

1.6 Ratio of provision for credit risks to loans (LLR)

This variable had to assess the credit risk management of banks. Many previous studies have found evidence of the effect of this variable on profitability, but the trend of influence is quite different. Provision for credit risks is an amount set aside to provide for possible losses due to customers of a credit institution not performing their obligations as committed (Muriithi & Waweru, 2017; Singh et al., 2021). Provisions for credit risks are calculated according to the principal balance and recorded in the operating expenses of the credit institution. The author gave hypothesis H5 following:

Hypothesis H5: There is a positive relationship between the ratio of provision for credit risks to loans (LLR) and return on assets (ROA).

1.7 Gross domestic product growth (GDP)

The economic growth rate variable divided the difference between the current period's economic size and the previous period's economic size by the earlier period's economic size (Petria et al., 2015; Samad, 2015). Previous studies also show a positive relationship between GDP and ROA coefficient. Business results of commercial banks are often affected by macroeconomic factors. When assessing their impact on commercial banks' profitability, the GDP growth rate is usually (Durguti, 2020). 2020 is a year of great difficulties and challenges for the world economy, including Vietnam. Thus, the author gave hypothesis H6 following:

Hypothesis H6: There is a positive relationship between gross domestic product growth (GDP) and return on assets (ROA).

1.8 Consumer price index (CPI)

The variable consumer price index indicates a country's inflation rate. Inflation reflects the devaluation of the currency, which will affect the nominal interest rate, impacting borrowers and making customers unable to repay their loans. In other words, high inflation can increase banks' credit risk because customers are more prone to default (Hirtle & Stiroh, 2007; Nuhiu et al., 2017). In recent months, inflationary pressures have increased, especially for food and food products, caused by supply disruptions, high savings, and accumulated losses due to high inflation, storms, and floods in many places across the country. Input food prices escalated with a reasonably high increase (Isayas, 2022; Yahya et al., 2017). Thus, the author gave hypothesis H7 following:

Hypothesis H7: There is a negative relationship between the consumer price index (CPI) and return on assets (ROA).

1.9 Covid-19 pandemic (Dummy)

In the Covid-19 pandemic, there are still complicated and unpredictable developments, causing significant impacts on Vietnam's socio-economic in general and the commercial banking sector in particular. The State Bank of Vietnam has issued many documents allowing commercial banks to restructure loan repayment terms, exempt or reduce loan interest, maintain the same debt group, and remove customer loan difficulties. The impact of the Covid-19 pandemic on the business results of the commercial banking system in general and ROA in particular (Isayas, 2022). Therefore, the author proposes the hypothesis H8 that there is a difference in ROA following:

Hypothesis H8: there is a significant difference in ROA affecting the Covid-19 pandemic.

The research model proposed includes eight independent variables and one dependent variable.
$$ROA_{it} = \alpha + \beta 1 OE_{it} + \beta 2 SIZE_{it} + \beta 3 LIQ_{it} + \beta 4 LEV_{it} + \beta 5 LLR_{it} + \beta 6 GDP_{it} + \beta 7 CPI_{it} + \beta 8 Dummy$$

Table 1. Hypothesis for factors affecting the profitability of commercial banks in Vietnam

Variables	Code	Estimated coefficient	Hypothesis
Dependent variable	ROA	-	-
Independent variables	OE	β1 < 0	There is a negative relationship between the ratio of operating expenses to assets (OE) and return on assets (ROA)
	SIZE	β2 < 0	There is a negative relationship between the logarithm of total assets (SIZE) and return on assets (ROA)
	LIQ	β3 < 0	There is a negative relationship between liquidity ratio (LIQ) and return on assets (ROA)
	LEV	β4 < 0	There is a negative relationship between leverage ratio (LEV) and return on assets (ROA)
	LLR	β5 > 0	There is a positive relationship between the ratio of provision for credit risks to loans (LLR) and return on assets (ROA)
	GDP	β6 > 0	There is a positive relationship between gross domestic product growth (GDP) and return on assets (ROA)
	CPI	β7 < 0	There is a negative relationship between the consumer price index (CPI) and return on assets (ROA)
	Dummy-Covid-19	β8 > 0	There is a significant difference in ROA affecting the Covid-19 pandemic

Source: Author' s analysis results

The banking industry plays an essential role in economic development and growth. Table 1 shows that commercial banks operate in money, credit, and banking services, considered a particular type of financial institution of the market economy to promote economic development. Profitability is one of the general economic indicators to evaluate the business performance of banks. In Vietnam, globalization has enhanced the connection between countries in different economic fields.

2. METHODOLOGY AND DATA

Research objectives
Factors affecting the profitability of commercial banks in Vietnam
↓
Relevant theoretical
Basis and domestic and foreign research related to the profitability of commercial banks in Vietnam
↓
Qualitative research
- The author collects data from from 25 commercial banks listed on the stock exchange from 2009 to 2020 related to the research objectives - Develop a discussion outline and conduct in-depth interviews with 11 experts in banking - Analyze and discuss survey results, compared with previous studies related to the profitability - Discover the factors and check the results of qualitative
↓
Quantitative research
- The models were analyzed quantitatively through OLS, FEM, REM, and SGMM regression to select the appropriate model. - Perform tests to ensure the estimate's robustness and unbiasedness. The paper used SGMM to overcome the disadvantages of the model. - Measure the level of impact of factors. - Check the goodness of fit of the model.
↓
Discuss results and recommendations
The author proposes management implications to enhance the profitability of commercial banks in Vietnam

Figure 1. A research process for factors affecting the profitability of commercial banks in Vietnam

Source: Author's process

The research method of the article is a combination of qualitative research methods and quantitative research methods. Secondary data such as return on total assets, indicators affecting ROA, and information had audited financial statements of Vietnamese commercial banks (Almaqtari et al., 2018; Aman et al., 2014).

The data relating to the banking industry, and macro data, including GDP, CPI collected from the State Bank of Vietnam General Statistics Office of Vietnam.

Data were entered into Excel and Stata 14.0 software to perform a comparative analysis of absolute and relative numbers to see changes in the research criteria. There are preliminary assessments on the relationship of factors to the ROA of commercial banks (Menicucci & Paolucci, 2016; Hair et al., 2021). Secondary data on Vietnamese commercial banks were collected from 25 commercial banks from 2009 to 2020.

3. EMPIRICAL RESULTS

3.1 Analysis of descriptive statistics for factors affecting the profitability of commercial banks in Vietnam

Table 2. Descriptive statistics for factors affecting the profitability of commercial banks in Vietnam

Variable	Obs	Mean	Std. Dev.	Min	Max
Roa	300	0.010	0.011	0.001	0.084
Oe	300	0.137	0.015	0.093	0.178
Size	300	7.932	0.511	6.522	9.173
Liq	300	0.186	0.093	0.045	0.610
Lev	300	11.307	5.013	2.008	33.113
Llr	300	0.009	0.006	0.001	0.050
Gdp	300	5.927	1.127	2.910	7.080
Cpi	300	5.910	4.604	0.630	18.58
D	300	0.083	0.276	0.000	1.000

Source: Authors collected and processed from Stata 14.0

Table 2 shows descriptive statistics on ROA and other indicators from 2009 to 2020 of 25 joint-stock commercial banks in Vietnam. The highest return on assets (ROA) average is 8.4 percent and 0.1 percent, respectively. In addition, the standard deviation of return on assets does not fluctuate much.

3.2 Analysis of factors affecting the profitability of commercial banks in Vietnam

Table 3. Factors affecting the profitability of commercial banks in Vietnam by Pooled OLS model

Roa	Coef.	Std. Err.	t	P>t	VIF	1/VIF
Oe	-0.760	0.064	-11.80	0.000	3.46	0.29
Size	-0.014	0.002	-7.300	0.000	3.58	0.28
Liq	-0.034	0.007	-4.990	0.000	1.43	0.70
Lev	-0.001	0.000	-3.230	0.001	2.17	0.46
Llr	0.306	0.090	3.390	0.001	1.30	0.77
Gdp	0.003	0.001	3.260	0.001	4.20	0.24
Cpi	-0.001	0.000	-3.420	0.001	1.83	0.54
D	0.008	0.004	2.120	0.034	4.23	0.24
C	0.223	0.022	10.13	0.000	-	-

Source: Authors collected and processed from Stata 14.0

Table 3 showed that all factors affect commercial banks' profitability in Vietnam with a significance level of 0.05. In addition, the multicollinearity test results VIF < 10. There is no sign of multicollinearity. Pooled OLS is a regression model in which all coefficients are constant over time and according to the individual characteristics of each individual. The data set had space and time but only estimated the conventional OLS model. This method will consider the effect of personal characteristics of each individual to be the same, besides that, although the OLS regression method had the best, unbiased, efficient linear estimator (BLUE). The results of model testing according to Pooled OLS shown above.

Table 4. Factors affecting the profitability of commercial banks in Vietnam by FEM model

Roa	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Oe	-1.02	0.08	-13.46	0.00	-1.17	-0.87
Size	-0.01	0.00	-2.27	0.02	-0.01	0.00
Liq	-0.05	0.01	-6.07	0.00	-0.07	-0.03
Lev	0.00	0.00	-4.32	0.00	0.00	0.00
Llr	0.44	0.10	4.26	0.00	0.23	0.64
Gdp	0.00	0.00	2.49	0.01	0.00	0.00
Cpi	0.00	0.00	-4.19	0.00	0.00	0.00
D	0.00	0.00	0.76	0.45	0.00	0.01
C	0.214	0.029	7.410	0.000	0.157	0.271

Source: Authors collected and processed from Stata 14.0

Table 4 shows the results of the FEM model regression. In which ROA is the dependent variable, the remaining variables are independent. The results showed Oe, Size, Liq, Lev, Llr, Gdp, Cpi và Dummy (D) affecting ROA at a 5% significance level. However, including the Dummy (D) factor does not affect ROA with a significance level of 5%. In addition, the author's Xtserial test shows that the FEM model with Prob > F = 0.0000 (<0.05) accepts H1, so the FEM model also has autocorrelation. The author continues to run the regression model according to REM as follows.

Table 5. Factors affecting the profitability of commercial banks in Vietnam by REM model

Roa	Coef.	Std. Err.	t	P>t	[95% Conf.	Interv]
Oe	-0.88	0.07	-12.62	0.00	-1.01	-0.74
Size	-0.01	0.00	-5.93	0.00	-0.02	-0.01
Liq	-0.04	0.01	-5.49	0.00	-0.06	-0.03
Lev	-0.00	0.00	-3.56	0.00	-0.00	0.00
Llr	0.37	0.10	3.89	0.00	0.19	0.56
Gdp	0.00	0.00	3.52	0.00	0.00	0.01
Cpi	-0.00	0.00	-4.10	0.00	-0.00	0.00
D	0.01	0.00	2.15	0.03	0.00	0.02
C	0.24	0.02	9.73	0.00	0.19	0.29

Source: Authors collected and processed from Stata 14.0

Table 5 shows that all factors affect commercial banks' profitability in Vietnam with a significance level of 0.05. In addition, the author tests Xtserial for the REM model with Prob > F = 0.0000 (<0.05) value, which accepts H1 so the REM model also has autocorrelation and Prob > chi2 = 0.0000 (< 0.05) accepts H1 so that the REM model has the phenomenon of variable error variance. Thus, the author has analyzed three different model estimation methods. The results show that the FEM and REM models do not have the phenomenon of multicollinearity, but the phenomenon of self-correlation and variance of the error occurs. There are three common models in Stata table data: OLS, Fixed effect model, and random effect model. We need to find the most suitable model among the three models above when running the model in the Hausman test to choose between the fixed-effect model FEM and the random effect model REM. Hausman FEM REM:

Test: Ho: difference in coefficients not systematic

$$chi2(8) = (b-B)'[(V\_b-V\_B)^{(-1)}](b-B) = 25.15, \ Prob>chi2 = 0.0015$$

(V_b-V_B is not positive definite).

Table 6. Factors affecting the profitability of commercial banks in Vietnam by SGMM model

Roa	Coef.	Std. Err.	t	P>t	[95% Conf.	Interv]
Oe	-0.88	0.07	-12.62	0.00	-1.01	-0.74
Size	-0.01	0.00	-5.93	0.00	-0.02	-0.01
Liq	-0.04	0.01	-5.49	0.00	-0.06	-0.03
Lev	-0.00	0.00	-3.56	0.00	-0.00	0.00
Llr	0.37	0.10	3.89	0.00	0.19	0.56
Gdp	0.00	0.00	3.52	0.00	0.00	0.01
Cpi	-0.00	0.00	-4.10	0.00	-0.00	0.00
D	0.01	0.00	2.15	0.03	0.00	0.02
C	0.24	0.02	9.73	0.00	0.19	0.29

Source: Authors collected and processed from Stata 14.0

Table 6 shows the model results at the 1% significance level. In the three models, the author can select the appropriate model three models Pooled OLS, FEM, and REM, by testing the hypothesis violations. In addition, the impact of the Covid-19 pandemic variable (Dummy) on the ratio of profit after tax to total assets (ROA) of Vietnamese joint-stock commercial banks in the period 2009 - 2020 is positive and has an estimated coefficient. quantity is 0.01 with a standard error of 0.00 (p = 0.00).

3.3 Result discussion

First of all, Managerial implications for the Government: (1) The Government, ministries, and localities need to speed up the effective implementation of solutions to support businesses and people to overcome the difficulties of the Covid-19 epidemic in terms of taxes, social security packages, and legal procedures. Besides, administrative procedures speed up the disbursement of public investment capital. (2) It is necessary to mobilize and effectively use resources, ensure a balance of resources to deploy support packages for employees, ensure social security, and support appropriate production and business. It is necessary to support the right target groups according to the Government's regulations. Identifying the right people is very important to avoid abuse, both from the management agency and the beneficiaries. In this way, we promote the effectiveness of support packages to help people and businesses overcome difficulties, restore production, and ensure revenue to repay bank loans.

According to Decision No. 32/2020/QD-TTG dated October 19, 2020, of the Prime Minister amending and supplementing many articles of Decision No. 15/2020/QD-TTG dated April 24, 2020, of the Prime Minister, The Government stipulates the implementation of policies to support people facing difficulties due to the Covid-19 pandemic and the Government's Resolution No. 68/NQ-CP dated July 1, 2021, on many policies to support workers, and employers facing difficulties due to the Covid-19 pandemic; In the spirit of the Government's direction, ministries, departments, and branches have urgently researched, developed, and issued specific guiding documents in each field they are in charge of, commercial banks continue to implement sound policies to support businesses combined with the General Department of Taxation to extend tax payment and land rent for those affected by the epidemic; exemption or reduction of taxes, fees, and charges for affected subjects, contribute to removing difficulties for production and business, ensuring social security. The relevant agencies shall guide the temporary suspension of social insurance payments for those affected by the pandemic. Without calculating interest and penalty for late payment according to their competence and provisions of law, consider the appropriate time to pay trade union dues, contributing to removing difficulties for businesses and organizations.

Limitations: this paper aims to overcome the limitations and weaknesses and minimize errors. This paper enriches more reliable data for evaluating factors affecting the ROA coefficient. New authors should carry out further research, including (1) The following study needs to collect more complete data sets of all domestic and commercial banks, including joint-stock commercial banks, state-owned commercial banks, joint-venture commercial banks, and commercial banks with 100% foreign capital. (2) Further research

needs to collect data from 2009 to 2021 to ensure the generalizability of the development process of commercial banks and the strong impact of the ongoing covid-19 pandemic. (3) Further research needs to add many other factors affecting the ROA of Vietnamese joint-stock commercial banks, such as exchange rate, net profit margin, and return on equity.

CONCLUSIONS

The main findings of the present study are commercial banks face many difficulties and challenges. Due to the epidemic, many businesses could not pay their debts, leading to an increase in the bad debt ratio, affecting the operational safety of the commercial banking system. Therefore, not only affecting credit demand, but the Covid-19 epidemic also significantly affected credit quality and profitability. By the end of 2020, Commercial banks' bad debt at 25 listed banks was at more than VND 97,280 billion, an increase of 31% compared to the end of 2019.

Compared with other studies on the industries directly affected by the Covid-19 epidemic, the banking industry initially suffered minor damage. But in fact, the deterioration of this industry is not light when about 70% of the total income of commercial banks still comes from interest income. If credit growth is unpromoted, the bank will fall into double difficulties when it lacks the primary source of revenue to make up for the shortfalls due to debt freezing, rescheduling, and provisioning for old and new debts. Meanwhile, loosening lending conditions is very risky. Therefore, the synchronous implementation of solutions; flexibly and effectively operating policies to facilitate minimizing the impact of the Covid-19 epidemic on the banking industry is meaningful in the current period.

ACKNOWLEDGEMENTS

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The Influence of Corporate Governance on Agency Costs in Context Omanian Market

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ARTICLE INFO

ABSTRACT

This research aims to examine the impact of corporate governance (board of director's characteristics and ownership structure) on the agency costs-assets utilization ratio, operating expense to sale ratio using a sample of Omania firms for the period 2009–2015. The paper employed regression method to test study hypotheses. The findings show that board size has significant negative impact on the assets utilization ratio but has positive and significant impact on the operating expense to sale ratio, also independence of board has positive and significant effect on both assets utilization ratio, operating expense to sale ratio. While, multiple directorship has no effect impact on the assets utilization, but has positive and significant impact on the operating expense to sale ratio. In terms of ownership structure attributes, the results indicate that institutional investors and state ownership have significant negative effect with both assets utilization ratio and operating expense. Whereas, ownership concentration has positive and significant relation with both assets utilization ratio and operating expense to sale ratio. Also this paper uses control variables such as leverage ratio, dividend payout ratio and firm size. The findings show that dividend policy and debt ratio are reducing agency cost, whereas, company size has no impact on the agency costs.

INTRODUCTION

In the modern organizations separation of ownership and management causing arise of agency conflicts among management of company and its owners due to misalignment of their interests(Jensen, 1986). Such conflicts may lead to damage value of company, and eventually to not wealth maximization of shareholders as main goal of management. The model of agency determines a number of governance tools that are able to reduce or eliminate such conflicts and their regarding costs incurred and realigning the interests among these parties(McKnight & Weir, 2009). Thus, ensuring that firm runs in line with the best interests of stockholders, this considered as a main aim of corporate governance (thereafter; is a CG). Generally, CG divides into external governance such laws regulations which concern with protecting of rights

of shareholders against misbehavior, like as an expropriation a wealth of minority by large stockholders. On the other side, internal CG could be seen as rang of tools of governance such regulations, internal laws, policies, practices and two important internal governance tools; board of directors and ownership structure. These two tools play important roles in reducing agency costs and ensuring that company run in line with owner's interests. In the same token, the structure of CG differs among countries, in the advanced stated considered be strong, while in emerging countries be weak like in case of Oman. The CG also classified to system of laws as strong CG, where investors enjoyed with high level of protection by law in common law countries (UK), and weak governance where investors enjoyed with lower level of protection by law in civil countries like as French.

Recently, in light of financial scandals CG received high attention by both academics, policy makers, and Practitioners. The countries take steps to reform and enhance CG, like as UAS "Sarbanes-Oxley Act", Malaysia (Germain, Galy, & Lee, 2014), these reforms ,for example, encouraging firm to add more external directors on the board of directors as they more effective in oversight management, thus, reducing possible agency conflicts. In context of Oman also government walk in the way of reforming of CG[1] (Elghuweel, 2015), as firms have less effective internal controls which causes a poor of performance of company as agency is high in such environment (Dry, 2003). In term of ownership structure also the difference exist between developed and under-developing countries, ownership structure is less concentration in developed states compared with emerging countries, ownership structure in Oman is highly concentration (Shehata, 2015). Thus, these differences in structure of CG may bring effects of effectiveness of CG and in addressing the agency conflicts in context of firm consequently on its value(Sajid, Muhammad, Nasir, & Farman, 2012).

This study aim to examine the effect of internal CG (board of directors, and ownership structure) on the agency cost motivated by; most of studies in this realm are advanced market based (Doukas et al., 2000a; Florackis & Ozkan, 2008; Henry, 2007), in context of Oman no former study done in this field to best our knowledge, former Omania studies focused on the effect of CG on performance (Al-Matari et al., 2014) CG and accounting standards (Shankaraiah, 2004). Thus, this study attempted to fill gap in literature related to the relation between CG and agency cost from emerging market that distinguish by highly concentration ownership structure and weak CG. Beside, as mentioned by (Siddiqui, Razzaq, Malik, & Gul, 2013) that empirical proofs regarding the roles of CG in reducing agency costs are still limited. Further, testing the application of predictions of finance theories (agency theory) in Oman market. The findings of study provide empirical evidences different parties, such as shareholder, managers of firms and policymakers on how the structure of CG effect on the agency costs in their firms, therefore, they may choose best structure of their CG that ensure good governance which reducing agency conflicts and maximizing value of corporation.

1. RELATING LITERATURE

Based on the agency theoretical view the nature of organization's ownership structure could signal to nature of agency costs within firm. Generally, agency costs does not exist in the organization that 100% owned and run by its owner, and starting to emerge as a result of selling shares of firm to others owners which lead eventually to separation between ownership and management of firm and , this, also lead to divergence interests between who own and who manage (Jensen, 1986). In context of firm the agency conflicts can appear in different forms, encompassing the self-interests actions by management that focus on empire-building aims, consumption of extravagant perks, non-optimal decisions of investment, earning management, ect. such actions have adverse consequences like as damaging stockholders wealth and it may leave effects on other firm stakeholders (Siddiqui et al., 2013). As argued by (Coles et al., 2008) that corporation adopts range of CG tools that reduce agency costs and agreeing with maximizing its values. However, it is proposing that agency problems can be minimized through internal CG tools and there is existence empirical proofs supporting such a statement (Siddiqui et al., 2013).

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[1] See for details (Dry, 2003; Shehata, 2015)

Board of Directors characteristics

Board Size and agency costs

There is no optimal board size fit all firms, in literature there are existence two arguments related to how size of board be effective in doing its roles in oversight of management behaviors, and thus, reducing possible arising of conflicts within corporation, and, to ensure that management works with the best interests of firm's owners, as stated by agency theory that managers of firms may follow their interests at account of stockholders (Jensen, 1986).

First view argues that small size of board is more efficient and powerful in oversight and advising of manager's company, and hence, minimizing arising of agency problems in context of company that due to easy coordination, cooperative, and communication among members of small board size, also it more effective in process of decision making (Boone et al., 2007). Second perspective states that large size of board considered to be less effective in the role of advising and monitoring management. This because difficult of coordination, cooperative, and communication among its members due to its size, beside, the free rider problems is apparent in large board and also such board could slowing the process of decisions making (Boone et al., 2007).

Former empirical proofs related to relation between size of board and agency offers mixed findings, for instance, (Florackis & Ozkan, 2008; D. Henry, 2007; Darren Henry, 2010; Yegon et al., 2014) reported that magnitude of board impact statistically significant negative on the proxy of agency costs (assets utilization), this in line with view that large board is not effective in overnight managers and, thence, large board not reducing agency problem. While, (Siddiqui et al., 2013) found that size of board has positive significant relation with the asset utilization, while (Chinelo & Iyiegbuniwe, 2018; Florackis & Ozkan, 2008) reported that size of board has negative effect on expense ratio, this implies that board is effective as CG tool and, thus, it reduces agency cost in term of control operation expense of firm.

Board independence and agency costs

Increasing the independence of board of directors is seen as effective tool of oversight that can has significant role in minimizing agency conflicts within firms. Thus, existence of external directors in board in significant percentage can lower the practice of managerial discretion through take advantage of their oversight capability and safeguarding their reputations. These directors are more effective in oversight of managers due to the highly worry on their reputation, panic of suing. Empirical evidences about the effect of independence of board on agency problems are inconclusive, (Florackis & Ozkan, 2008; Owusu & Weir, 2018) found that independence of board has no effect on agency costs (asset using) findings are negative insignificant but positive and significant with expense to sale ratio, this suggests that independence of board does not minimize agency costs. The results of (McKnight & Weir, 2009; Yegon et al., 2014) show external has no significant effect on the agency (assets using) the relation was positive and insignificant. Studies of (Sajid et al., 2012) found that independent directors have positive significant relation with asset using. While , the findings of (Bameri & Jabari, 2014) show that relation between independent directors and agency cost (operation expense to sale ratio) is negative and significant i.e. these directors reduce agency cost.

Busy directors and agency costs

Busy directors are these directors who appointment on the other seats of board of directors. There are two arguments on how about such directors can effect on the effectiveness of board of directors. On the one side, these directors make board of directors more effective in doing its main roles in oversight and advising management. This because directors who serve on others boards become more diversity in the experiences, knowledgeable, skillful, competence, making better decisions and, thus, they are more active in oversight of management action and behaviors, consequently agency costs reduced in firm. Further, Busy directors could bring different external business environment links and styles of management to new firm they appointed for (Field et al., 2011). In light with this view, one can expectation that busy directors are enhanced effectiveness of board and, thence, minimizing agency problems within their corporations.

On the other hand, in light of busyness hypothesis, busy directors on the board should lower its efficiency in doing its main jobs oversight and advising. This Due that these directors are so busy in many

tasks from different board they are serving and, thence, they do not find enough time for reviewing a reports, actions, and decisions of managers. Besides, busy directors because of their busy lives, are more probable to be absent from board meetings. Hence, they are less likely to participate in the main policy resolutions of the board of directors. This implies that agency costs may be high with their existence within firm. Thus , they do not enhance performance of firm, this supported by findings of (Fich & Shivdasani, 2006), they found that return on assets was lower for firms with busy directors compared to counterparts ones. One could argue that board with busier directors is less efficient and firm will experience higher agency costs.

Ownership structure

Ownership Concentration and agency cost

Concentration ownership in hand of large shareholders serve as a device for reducing agency conflicts (Florackis & Ozkan, 2008). Those stockholders have incentives to monitor the managers of firm due their substantial share and are more effectively in oversight compared with who have little share . In spite of that large stockholders may assist in the alleviating of agency conflicts related to divergence of interests, but, they could also arise other conflicts with minority shareowner. This particular, when they engage self-dealing expropriation actions at the account of minority stockholders, particularly where ownership is highly concentrated in hand of few investors , thus , they obtain nearly complete control of firm (Florackis & Ozkan, 2008). Former research reported inconclusive findings on the effect of large stockholders on the agency costs, for example, (Florackis & Ozkan, 2008) indicated that concentration of ownership effect positive and significant on ratio of assets utilization[2] and negative with expense to sale ratio, this proposes that large shareholders are reducing agency cost due their intensity of manager's oversight. While (Singh et al., 2003) found that external block ownership has positive insignificant effect on asset using and negative insignificant effect on operation expense ratio. Similar findings reported by (Henry, 2007) for asset utilization. opposite findings reported by (Siddiqui et al., 2013), they found that block shareholder effect negatively and significant on the asset utilization, which means that they do not reduce agency cost since their existence do not enhance efficiency of using asset of firm. While , the findings of (Chinelo & Iyiegbuniwe, 2018) show that concentration of ownership has no relation (positive insignificant) with agency cost(expense ratio).

Institutional stockholders and agency costs

Presence of institutional stockholders in ownership structure is more probable lead to reduce agency conflicts within firm due to the oversight of institutional stockholders (Doukas et al., 2000a). This due to their share are large, having enough resources to be dedicate for oversight and their experience in oversight compared to other types of investors. Thus, it expected they have negative effect on the agency cost. On the other hand, Institutional stockholders could be also ineffective in oversight of managers actions because of do not have time or not enough resources to consecrate to active oversight, thus, their existence on ownership structure do not reduce agency problems (Zeckhauser & Pound, 1990).

Empirical proofs in former studies are mixed on how institutional investor effect on the agency cost, studies show that these institutions reduce agency costs, for instance, (Doukas et al., 2000a; Henry, 2007; Owusu & Weir, 2018; Sajid et al., 2012; Yegon et al., 2014) found that Institutional shareholder have positive and significant relation with agency cost (asset using), i.e. institutional ownership enhance efficiency of company asset using and ,thus, minimizing agency costs . Also (Owusu & Weir, 2018) Found negative significant relation for operation expense ratios, this implies that institutional investors are reducing agency costs. While, other research reported institutional investors have no impact on the agency costs, for instance, (Bameri & Jabari, 2014) found there is no relation between Institutional investors holding and agency cost i.e. positive insignificant (operation expense to sales), similar findings by (McKnight & Weir, 2009) but for asset turnover, same findings reported by (Darren Henry, 2010) there is no effect for Institutional investors holding on agency cost finding negative insignificant in both measures asset using and expense ratio.

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[2] This is inverse measure of agency costs

State ownership and agency costs

In context of agency theory, agency conflicts are existing in the state owned firm as result of separation of ownership and management. In such firms due to that owners is public but the controllers are politicians, thus, there is no personal owner has a strong motivation to engage in active oversight, therefore, agency problem may be high in such a firm . Besides, management of state owned firms is assessed based on the obtaining of political aims instead of the profit maximization, and is less liable to pressures of stock market or labor market. Thus, following the political aims of state could hinder efficient CG's practices (Borisova et al., 2012).Therefore, lack of both internal oversight and external CG tools, management in such firm has motive to consume private benefits. Further (Borisova et al., 2012) argued that increase the state ownership related to lower quality of CG. According to (Borisova et al., 2012) that ease of securing funds by state owned firms could dishearten oversight, permitting agency costs to evolve. In line with this (Ben-Nasr et al., 2012), argued that state ownership due to the agency costs and asymmetric information lead to increase financing cost, their empirical findings supported this argument. (Chen, 2010) found that state ownership has negative relation with free cash flow[3] and administrative expenses as proxies of agency costs. This implies that state ownership reduces agency costs as an administrative expense is reduced and size of free cash flow with state ownership.

Control factors

This study utilized control variables; leverage ratio used to control role of leverage on management's discretion use of free cash flow. It expected that the agency problems to minimized for firm that employ debt in its capital structure because of strong oversight from capital providers on management actions to guarantee get back their fund, so it expected inverse relationship between leverage ratio and agency costs. The size of company also encompassed in the analysis as control factor, as agency conflict could be more pronounced in larger firms compared small firms (Doukas et al., 2000a; Singh et al., 2003), they found positive significant relation between firm size and agency cost. Moreover, the dividend payout ratio incorporated in the model to account for the effect of dividend policy on the agency cost, since payment of dividends reduce size of free cash flow in hand of managers consequently dividend considered as tool of oversight of managers (Dwaikat, Queiri, & Aziz, 2015). Studies reported that paying reducing agency cost where they found positive relation between dividend payout ratio and asset utilization as proxy of agency cost (Henry, 2007).

Table 1. Summarizing of prediction of hypotheses for the relations between independent factors, control variables and dependent factor

Factors	Proxies	Prediction sign
State ownership	Asset utilization	Negative
	Operation expense to sale ratio	Positive
	Dummy for high growth and low growth firm	Negative
Institutional ownership	Asset utilization	Positive
	Operation expense to sale ratio	Negative
	Dummy for high growth and low growth firm	Positive
Ownership concentration	Asset utilization	Positive\ Negative
	Operation expense to sale ratio	Positive\ Negative
	Dummy for high growth and low growth firm	Positive\ Negative
Independence of board	Asset utilization	Positive
	Operation expense to sale ratio	Negative
	Dummy for high growth and low growth firm	Positive

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[3] Most studies in this realm did not examine the effect of state ownership on agency cost, this is only study was found to best our knowledge.

Beard size	Asset utilization		Negative\Positive
	Operation expense to sale ratio		Negative\Positive
	Dummy for high growth and low growth firm		Negative\Positive
Multiple directorships	Asset utilization		Negative\ Positive
	Operation expense to sale ratio		Negative \ Positive
	Dummy for high growth and low growth firm		Negative \ Positive
Leverage ratio	Asset utilization		Positive
	Operation expense to sale ratio		Negative
	Dummy for high growth and low growth firm		Negative
Dividend payout ratio	Asset utilization		Positive
	Dummy for high growth and low growth firm		Negative
Company size	Asset utilization		Negative
	Operation expense to sale ratio		Positive

2. RESEARCH METHODOLOGY

2.1 Measuring of variables

Agency costs

Former studies employed different measurements for measure agency cost, Most of them used the ratio of asset utilization and expenses ratio (Doukas et al., 2000; D. Henry, 2007; Darren Henry, 2010; Owusu & Weir, 2018; Sajid et al., 2012; Yegon et al., 2014). This study followed those studies and also used others proxies; high and growth firm.

Fist, Asset utilization has been employed as proxy of agency cost in many former studies, so this study those studies (Henry, 2007; Singh et al., 2003), it gauges the efficiency of using managers asset of company and generating sale. When this ratio is high indicating that managers are creating great sales and thus propose less agency cost. On the other side, when this ratio is lower indicates that managers not do well or applying policies like as underinvestment or consumption extravagant perquisites. Thus, lower this ratio points out that agency cost is high and inefficient asset suing by managers.

Second, Operation expense to sale ratio where is considered as a direct measurement of agency costs which reflect the managerial discretion to the resources of firm and appears the extravagant expense for perks consumption or they do not control the operation expense within firm. Therefore, Increasing this ratio implies that high agency costs in firm(McKnight & Weir, 2009). Finally, agency problems could be related to growth of firm, for example, underinvestment, asset substitution, and size of free cash flow. Where management may decide to not take positive net present value projects because of that benefits accrue to holders of debt, this more acute for companies with high growth chance. The issue of assets substitution, happening when management replace high variance asset for low variance asset, this is more prevailing in high growth company because of information asymmetry between management and debt providers (Jensen, 1986). In specific, if agency conflicts is related with asymmetric information or underinvestment, which is likely to be in high growth company, it anticipated CG tools that reduce these types of agencies costs to be more efficient for corporation with high growth chances (Smith & Watts, 1992). This measurement is computed as indicator factor based on the sample company yearly Tobin's Q. Where, this indicator factor is given a value of 1 if the ratio of Tobin of company more one and is allocated a value of zero if this ratio is lower than or equal to one.

For independent variables in this study is clarified their measurements as follow; Variable related to board of directors are independence of board, size of board of directors and multiple directorships. Independence of board computed as numbers of external directors on the board to total number of member's

board. Size of board is calculated as total number of members of boards. Busy directors is also computed as total number of members who at least have other seat membership on the other boards to total number of members of board (Haniffa & Hudaib, 2006). Variable regarding's ownership structure included in this study are ownership of state, institutional ownership and ownership concentration. Ownership of state is calculated as 5% and above own by government. Institutional ownership is computed as sum of ownership 5% and above own by Institutional like a banks insurance firms or companies ect. Ownership concentration is calculated as 5% and above own by external owners. Financial variable in this study (whether for control variables or these used to compute agency costs) are obtained from Bloomberg database.

Table 2. Summarizing of measurement of variables incorporated in this study

Variable name	Code in	Measure	Source
Independence of board	INDP	numbers of external directors on the board divided by total number of member's board	Hand collected form annual report
Size of board	BS	total number of members on boards	Hand collected form annual report
Busy directors	MDS	total number of members who at least have other seat membership on the other boards divided total number of members of board	Hand collected form annual report
Ownership of state	STOW	5% and above own by government	Hand collected form annual report
Institutional ownership	IOW	sum of ownership 5% and above own by Institutional like a banks insurance firms or companies	Hand collected form annual report
Ownership concentration	OWC	5% and above own by external owners	Hand collected form annual report
Company size	Fsize	Nature logarithm of total assets	Bloomberg database
Leverage	Leverage	Total debt dividend total asset	Bloomberg database
Dividend payout ratio	PAYOUTRATIO		Bloomberg database
Agency cost	Assettrurnover	Total sales dividend total asset	Bloomberg database
Agency cost	Expensale	Operation expense dividend total sale	Bloomberg database
Agency cost	dummyQ	Dummy take value 1 if value of Tobin Q is great than one and zero if Tobin Q is less or equal to one in specific firm	Hand computed; Tobin Q is gained from Bloomberg database

2.2 Sample selection and analysis methods

The firms sample used in this study was derived Oman stocks market, more specifically form regularly market 30 index that content for period of 2009-2015. Non-financial firms (industrial and services firms) only incorporated in this study, also firms with substantial missing data are excluded, which left sample with 14 firms. data regarding the CG i.e. ownership structure and board of directors are collected from annual reports and website of Oman stocks exchange, while financial data are obtained from Bloomberg database.

This paper used the ordinary least squares regression to estimate the effect of CG on the agency costs a as former studies (Florackis & Ozkan, 2008), and as study of (Henry, 2007) logistic regression model used to estimate the effect of CG on the agency costs, when dependent variable is binary for agency costs as one for high growth firm and zero for low growth firm as definition in table 1 for all variable incorporated in this study.

$$AGENCY\ COST_{it}$$
$$= \alpha_i + \beta 1\ STOW_{it} + \beta 2 IOW_{it} + \beta 3O\ WC_{it} + \beta 4\ BS_{it} + \beta 5 INDP_{it} + \beta 6 MDS_{it}$$
$$+ \beta 7\ Leverage_{it} + \beta 8\ Fsize_{it} + \beta 9\ PAYOUTRATIO_{it} + \varepsilon_{it}$$

Where AENCY COST is dependent variables (Assettrurnover, expensale, and dummyQ) definition in table 2, independent variables STOW is sate ownership, IOW is intuitional ownership, OWC is ownership concentration, BS is size of board, INDP is independence of board, MDS IS multiple directorship, leverage is leverage ratio, Fsize is firm size, PAYOUTRATIO is dividend payout ratio, ε is error term and α constant, all

definition of variables are in table 2. Note when dummyQ is dependent variable logistic regression model will be used.

2.3 Descriptive analysis

Table 3. Descriptive Statistics

	N- ob-serva-tions	Mini-mum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
Assettrurnover	96	.04	2.01	68.59	46.083	1.224	.964
expensale	97	.65	1.5862	24.6514	32.23915	2.063	4.798
STOW	98	.00	70.00	13.2557	21.66571	1.508	.774
IOW	98	.00	84.00	43.7513	16.99448	-.415	-.374
OWC	98	10.83	70.00	36.1136	16.18967	.252	-.797
BS	98	5.00	12.00	7.5714	1.66838	1.239	1.390
INDP	98	.00	100.00	78.5592	28.59382	-.992	-.479
MDS	98	.00	100.00	59.2275	29.79352	-.449	-.654
Leverage	98	.00	77.84	23.6026	21.93315	.920	-.093
Fsize	98	15.91	20.54	18.3568	1.26303	-.004	-.913
PAYOUTRATIO	88	.00	80.707	74.1770	96.19866	6.136	42.798

Table three offers descriptive statistics for variables of study in the period of 2009 to 2015. Across Omania corporations Mean of agency costs proxies; asset utilization is 68.59 and it rang between .04 and 2.01. While, operations expense to sale ratio has mean 24.6514 with minimum .65 and maximum 1.5862. Whereas, state ownership has mean 13.2557 for period of study and its owner range between zero to 70.00, institutional ownership has on average in Omania firm 43.7513 with minimum zero and maximum about 84.0. On average large stockholders has 36.1136. Omania corporations have on average about 12 members on their board and high independence of their about 78.55 and who have one seat on other board from their board members is about 59.22. Further, Omania firms used debt in their capital structure about 23.60 and having size on average 18.35, also they have dividend payout ratio on average 74.1770.

Table 4. Correlation matrix

Variables	1	2	3	4	5	6	7	8	9	10
1) dummyQ	1.									
2) STOW	.026	1.								
3) IOW	.305	.354	1.							
4) OWC	.108	.587	.727	1.						
5) BS	.135	.059	.228	.212	1.					
6) INDP	-.068	.055	-.146	-.202	.273	1.				
7) MDS	-.164	-.170	-.388	-.367	-.624	.152	1.			
8) Leverage	-.088	-.415	-.174	-.250	.433	.277	-.159	1.		
9) Fsize	.105	.347	.222	.497	.378	.005	-.268	.273	1.	
10) PAYOUTRATIO	-.071	.305	.130	.187	-.002	.126	.185	-.203	-.081	1.
Variables	1	2	3	4	5	6	7	8	9	10
1) Assettrurnover	1.									
2) STOW	-.291	1.								
3) IOW	-.236	.355	1.							
4) OWC	-.128	.587	.727	1.						
5) BS	-.275	.059	.228	.212	1					

	1	2	3	4	5	6	7	8	9	10
6) INDP	.029	.055	-.146	-.202	.273	1.				
7) MDS	.152	-.170	-.388	-.367	-.624	.153	1.			
8) Leverage	.138	-.415	-.174	-.250	.433	.277	-.159	1.		
9) Fsize	-.059	.347	.222	.497	.378	.005	-.268	.273	1.	
10)PAYOUTRATIO	.273	.305	.130	.187	-.003	.127	.185	-.203	-.081	1.
Variables	1	2	3	4	5	6	7	8	9	10
1) expensale	1.									
2) STOW	.506	1.								
3) IOW	.267	.354	1.							
4) OWC	.498	.587	.727	1.						
5) BS	.048	.059	.228	.212	1.					
6) INDP	.125	.055	-.146	-.202	.27	1.				
7) MDS	.213	-.170	-.388	-.367	-.62	.153	1.			
8) Leverage	-.401	-.415	-.174	-.250	.433	.277	-.159	1.		
9) Fsize	.210	.347	.222	.497	.378	.005	-.268	.273	1.	
10) PAYOUTRATIO	.677	.305	.130	.187	-.003	.127	.185	-.203	-.081	1.
Variables	1	2	3	4	5	6	7	8	9	10

Table 4 presents results of correlation between agency costs as dependent variable and other independent variables. For example, the relations between asset utilization and state ownership and institutional, ownership concentration board size, and firms size is negative, while, the relation between asset utilization and independence of board, busy directors and leverage ratio payout ratio is positive. Similar, ownership variables and board characteristics and control variable also have positive correlation with operation expense ratio, expect the leverage ratio has negative correlation with operation expense ratio.

3. EMPIRICAL FINDINGS

Findings of asset utilizations and Operation expense ratio as proxy of agency cost

Table 5. Ordinary lest squares estimation; dependent variable asset utilization(Assettrurnover) and Operation expense ratio(expensale) as a proxy for agency costs, independents factors are STOW ; state ownership , IOW ; institutional ownership , OWC; concentration ownership , Bs ; board size ; INDP; independence of board , MDS; busy directors, control factors are a leverage; leverage ratio , Fsize; company size , and PAYOUTRATIO is dividend payout ratio, definition and measurements of all factors in table 2. Also, time dummies and industry dummy are incorporated in models. VIF is variance inflation factors, further, standard error is robust for heteroscedasticity

	Assettrurnover Coefficient	t-statistic	VIF	expensale Coefficient	t- statistic	VIF
Constant	1.42454	1.31		-103.63	-3.1 ***	
STOW	-0.0054	-2.58 **	2.56	-0.1497	-1.14	2.56
IOW	-0.0104	-2.13 **	2.55	-.3006	-1.9 *	2.55
OWC	0.01626	3.17 ***	4.31	.88652	3.81 ***	4.31
BS	-0.113	-2.84 ***	3	3.49579	2.48**	3
INDP	0.00376	2.32 **	1.71	0.14798	2.65 **	1.71
MDS	.0000438	0.02	3.14	0.23525	2.42 **	3.14
Leverage	0.00509	1.63	2.36	-0.6611	-5.2 ***	2.36
Fsize	-0.0204	-0.35	2.33	3.75507	1.56	2.33
PAYOUTRATIO	-0.001	-3.15 ***	1.44	0.15685	6.55 ***	1.44
year	Yes			Yes		
Sector	Yes			Yes		
R-squared	0.3816			0.8512		

Significance level at 1%, 5% and 10%, ***, **,* respectively

Table 5 present results of analysis effect of CG on assets utilization and operation expense to sale ratio, the issue of multicollinearity does not presence in both models as values of variance inflation factors

not excess 10. Asset utilization model has R-squared about 20% which mean that variation in the response variable asset utilization is explained by included independents variable about 20%, and operation expense ratio model has R-squared about 85%, i.e. Incorporated independents factors are explained about 85% of changing in dependent variable.

The findings in table 5 indicate that state ownership effect negative and significant on the efficiency of firm, but, it appears to has no influence on the operation expense ratio, this findings are not in line with (Chen, 2010). This suggests that government ownership does not reduce agency problem within corporation, this also , in line with argument of (Borisova et al., 2012) that state ownership reduced quality of CG and allowing to agency cost to develop. Possible explanation, due that there is no individual owner who has robust incentives to exert oversight of manager's mis-actions and, thus, agency costs do not reduce with state ownership.

Results relating to intuitional ownership are in contrast with prediction of argument that institution are good monitors, thus, their existence in ownership of firm minimize agency problems within firm. Their impact finds to negatively and statistically significant on asset using. This similar to finding of (Hassani & Torabi, 2014), but is not in line with (Henry, 2007; Owusu & Weir, 2018; Yegon et al., 2014). But such findings could be explained in context of argument(Zeckhauser & Pound, 1990) where these intuitions may have not time and enough resources to allocate for oversight activities of manager and , thus , they do not oversight using of firm assets and not contribute to minimize agency conflicts within company or due to their private lucrative relations with managers of firm they arise agency cost rather than reduce. However, these owners are reducing agency cost in term of control operating expense as finding show their effect is negative and significant on the operation expense ratio, therefore, such result is in line with statement that institution are good monitors of manager behaviors, this in consistent with (Owusu & Weir, 2018).

Ownership concentration has positive significant relation with asset utilization, this means that block stockholder are good monitors for management actions, thus, reducing agency costs. Similar findings reported by (Florackis & Ozkan, 2008; Singh et al., 2003), and such result is opposite to (Siddiqui et al., 2013). However, the findings show that concentration of ownership has positive significant relation with operation expense ratio , this not in line with findings of (Florackis & Ozkan, 2008). One possible explanation, that block stockholders in environment of weak CG where investors protection is weak could they practice expropriation wealth of minorities, thus, second types of agency cost be dominate in such place i.e. conflicts between large and small stockholders rather than principle-agent conflicts.

While, findings show that size of board negatively and significant effect on asset utilization and positively on operation expense ratio, this agree with that large is less effective in oversight of manager, therefore, it does not minimize agency problems within company i.e. large board not improve efficiency of firm in using its assets and also large board not control on the expense of firm. Same findings reported by (Florackis & Ozkan, 2008; Darren Henry, 2010; Siddiqui et al., 2013). Results point out that independence of has positive and significant relation with both asset utilization and operation expense ratio, so, external directors enhance effectiveness of board of directors in monitoring manager behaviors as they enhance using of firm's asset. Further, such findings reported by (Sajid et al., 2012). But also they do not control actions of managers in related to expense of firm as findings indicate their effect is positive on expense ratio, finding is in line with (Florackis & Ozkan, 2008). The results point out that multiple directorship has no effect on the asset utilization but has positive and significant on the operation expense ratio. This, could be explained by busy hypothesis which predicts that director with many seats on other board have less time to oversight manager's actions, thus, they do not enhance board effectiveness. Therefore, these busy directors do not enhance using of firm nor control firm operation expense and, thus, they do not align interests between management and shareholders. To best our knowledge no former study considered the effect of busy directors on agency costs.

Results regarding control variables indicate that leverage ratio has no influence on asset utilization, debt ratio has positively but insignificant effect on asset utilization, but debt ratio has negatively significant effect on the expense ratio this in line with argument of (Jensen, 1986) that using debt reduce agency costs due to oversight of capital providers. Firm size has no impact on agency costs in both measurements asset utilization and operation expense ratio. Findings are negatively but insignificant on asset utilization,

and is positive but insignificant operation expense ratio. Dividend policy influence negatively and significant on asset utilization, and it impacts positively and significant on the operation expense ratio, so dividend policy does not contribute to control expense of firm nor improving asset utilization. This against findings of (Henry, 2007; Darren Henry, 2010). Thus, distributing dividend does not reduce agency costs in Omania firms. Further, findings regarding dividends policy does agree with (Jensen, 1986) argument as paying dividend reduce free cash flows consequently reducing agency costs.

High-low growth firms as a proxy for agency costs

Table 6. logistic regression estimation; dependent variable dummy variable one for high growth and zero for low growth (dummyQ) as a proxy for agency costs, independents factors are STOW; state ownership, IOW; institutional ownership, OWC; concentration ownership, Bs; board size; INDP; independence of board, MDS; busy directors, control factors are a leverage; leverage ratio, Fsize; company size, and PAYOUTRATIO is dividend payout ratio, definition and measurements of all factors in table 2. Also, time dummies and industry dummy are incorporated in model. further, standard error is robust for heteroscedasticity

DummyQ	Coefficient	z-statistic
Constant	-49.867	-2.93 ***
STOW	0.14496	1.64
IOW	0.49529	3.09 ***
OWC	-0.42	-1.94 *
BS	2.51238	3.79 **
INDP	-0.0426	-0.93
MDS	0.08442	2 **
Leverage	-0.0948	-2.53 **
Fsize	1.29225	1.44
PAYOUTRATIO	-0.029	-1.24
Year	Yes	
Sector	Yes	
Pseudo R2	0.6144	
Wald chi2	32.76 [a]	
Hosmer-Lemeshow	2.87	Prob = 0.9422

Significance level at 1%, 5% and 10%, ***, **,* respectively

Hosmer-Lemeshow test indicate to goodness of fit for logistic regression with null hypothesis that model has to goodness of fit , so, large p-value signal that model has goodness of fit (Allison & Llc, 2014). From table 6 is clear that model of high-low growth chances has goodness of fit as p-value is 0.9422. Wald chi2 is "testing that the parameters of interest are simultaneously equal to zero", the findings of Wald chi2 show it has value 32.76 and p-value is significant at level 1%.

The coefficient of institutional is positive and significant, this propose that institutional are good monitors and are more likely to be with firm recording value of tobin Q ratio more than and they minimize the likelihood of agency problems arising, in form of ratio of tobin Q lower than one. Same findings reported by (Henry, 2007). Negative regression coefficient is observed for the concentration ownership, such result in contrast with (Henry, 2007), but in lien with that large stockholders may not improve performance of firms and, thus, not alleviate likelihood of creating agency cost , this may be due to their expropriation wealth of minority. However, coefficient of state ownership is positive and insignificant.

The findings of table 6 show that large board has positive and significant relation with proxy of agency costs, this in not in line with findings of (Henry, 2007) , who Board size negative insignificant, but is consistent with that large board enhance board effectiveness and, thus, it reduce the probability of arising of agency conflicts(Coles et al., 2008). The coefficient of independence of board found to negative and insignificant, this is not line with (Henry, 2007), found independence positive significant with high and low growth. While, the coefficient of busy directors "multiple directorships" show there positive and significant,

this suggests that these directors are enhance board effectiveness and minimizing the probability of arising of agency conflicts but increasing likelihood of company recording high tobin Q. This, in line with that busy directors enhance effectiveness of board in oversight of managers of firms through bring new ideas, skills, views, ect.

In terms of control variable, findings in table 8 show that leverage ratio has negative significant coefficient, this implies that using debt by firm rise the likelihood of arising of agency costs, and firm utilizes debt rise the probability of recoding of ratio of tobin Q less than one. This finding is in contrast of (Henry, 2007) , who found that leverage is negative insignificant. Other two control variables show no relations with agency as measured by high-low growth, coefficient of firm size is positive and insignificant, (Henry, 2007) found firm is size negative and significant, and dividend payout ratio is negative insignificant, (Henry, 2007) found dividend policy is negative significant in similar measurement of agency.

CONCLUSION

This research has concentrated on studying the agency cost environment related with listed firms on the Omania stock market, which is an issue that has not formerly been examined empirically. Significance is placed on this study question because of differences in corporate governance and ownership's structure traits that observed in the Omania market that are hypothesized as making possible agency conflicts increasingly prevailing in the Omania context. The analysis conducted utilizing data from period of 2009-2015 offers essential proofs supporting this initial anticipation, analysis shows that presence of state ownership and institutional investors in ownership structures of Omania firms lead to significant minimizing in agency problems in terms of controlling operation expense ratio as a direct measurement of agency costs, however, these kinds of ownerships do not enhance efficiency of firm's asset utilization. While, ownership concentration in hand of large stockholders improves the efficiency of firm's asset utilization, but it does not reduce agency costs in terms of controlling operation expense to sales ratio. Further, analysis shows that large board is not effective monitoring tool that lead to reduce agency costs, it does not enhance corporation's assets using nor control discretionary expense. While, greater independence of board lead to improve utilization of firm assets, but not effective in controlling of operation expense ratio. Final characteristic of board considered in this study is busy directors, findings they do not reduce agency problem in terms of controlling of operation expense to sales ratio, but they have no effect of the firm's assets utilization.

Finally, results of agency costs as measuring by dummy variable high low growth firm based on the tobin Q, show that institutional investors are more probability to reduce arising of agency costs, similarly, large board size and members with multiple directorships are alleviating the likelihood of arising of agency problems. Ownership of large stockholders are not reducing likelihood of creating agency costs. However, the independence of board and state ownership analysis show they have no significant relation with this measurement of agency costs. Finally, the analysis shows that control variables in general, that leverage and dividend payout ratio are effective in reducing agency costs, but the firm size has no impact on the agency costs.

Implications and limitations of study

The results of study have implications for stockholders and management of companies and for regulators of corporations worried about the performance, structure and integrity of the corporation's sector. The inference that agency problems may be more prevalent in the Omania market has possibility results for risk of investors and costs of funds requirements and, more significantly, the capability of recorded firms to entice local and foreign investments. The findings in this study show, however, that code of CG[4] should be considered from a comprehensive structural view, instead of necessarily anticipating individual governance changes to have essential impacts on the performance and the agency problems. This in line with the results in the recently empirical governance studies concentrating on the relation between performance and risk measurements and wider construction of governance index. The results indicate that

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[4] For more details, see for example (Elghuweel, 2015)

insider's governance structure and outsider ownerships impacts are replacement agency-reducing tools asserts the consideration of the incentives and behaviors of main stockholders, and proof of the desirable oversight and agency costs impacts of institutional investors is supportive of greater integration of the role of such kind of investors into CG in context of Oman.

Future studies, as they start from point of end of former literature, therefore , future research may considered other kinds of ownership like as family-ownership how it effect on the agency costs within firm, as mentioned by (Institute of international finance, 2007) family ownership is wider in Oman. Future studies also examine the effect of ownership and board of directors as internal governance tools on the agency costs in context of other industries like insurance companies, banks, ect, this will give more proofs about the application of finance's theories (e.g. agency cost theory) in context of Oman market.

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The Nonlinearity Between Innovations and Deposits Growth: Evidence From a Transition Economy

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ARTICLE INFO

ABSTRACT

Our study is the first to examine the nonlinearity between innovations and the deposit growth of commercial banks in Vietnam, a transition market in Asia. We manually collect data from financial statements from 31 commercial banks in Vietnam from 2010 to 2020. We employ the Random Effect Models and the Generalized Method of Moments steps to analyze a sample of 296 annual bank-year observations. However, the Traditional Least Square violates heteroskedasticity and autocorrelation assumptions, so we mainly discuss the results from the Generalized Method of Moments estimations. Our findings indicate a positive impact of training costs on deposit growth, implying that training and seminars improve service quality to attract higher deposit growth. Moreover, our findings report that banks with mobile banking applications have 10.64% higher deposit growth than banks without mobile banking. However, R&D costs discourage customers from saving money in the banks. It is because technology development reduces the information asymmetry between customers and banks. Therefore, customers receive lower saving rates for online saving products due to lower uncertainty. Unfortunately, our findings fail to report a nonlinearity between innovation and deposit growth. Finally, Our findings contribute practical implications for bank managers and policymakers in Vietnam and other emerging markets. Our findings suggest that commercial banks need to develop a strategy to support the development and exploitation of technology infrastructure to improve efficiency. Commercial banks may also focus on increasing training and seminars to develop their workforce and service quality and diversify their services, empowering the sustainable developments of commercial banks.

INTRODUCTION

Commercial banks are financial intermediaries that connect the borrowers and depositors in the economy. The deposit is crucial in the banking system's stability and fund management. Technology has been proliferating recently, and it helps people save more time and resources. Innovation must be implemented to enhance the fundraising services, such as mobile banking, SMS, training labor force, research, and development costs. In 2012, mobile banking was first released in Vietnam. Since then, 49 banks have applied mobile banking systems for helping customers and providing instant service, and mobile banking plays a prominent role in the banking system. The bank offers a deposit servicer at the counter and provides the same banking service at the Automatic Teller Machines (ATM). Saving money is a safe choice with a reasonable interest rate compared to other investment channels. Banks transform deposits and savings into credit activities that generate profitability. Therefore, commercial banks must compete fiercely to increase deposit growth to foster their performance. Since 2020, the pandemic of COVID-19 has spread worldwide, and it is challenging for banks to provide banking services at the counter. Following the restriction from the government in each stage of the pandemic, commercial banks partly closed due to social lockdown. The new process for banking systems is applied, and more innovations and traditional banking services are conducted online. Consequently, Research and Development (R&D) costs have become an essential factor in the banking system.

Kashmari et al. (2016) indicate that using the facility positively affects customer satisfaction and motivational factors. Innovation requires considerable resources and long-term commitments. One of a bank's most essential objectives and competitive advantages is the share of each bank in attracting deposits. Abubakar (2014) suggests that innovation favorably increases the deposit. They recommended that if the bank wants to increase the deposit growth in operation, it should provide more services related to the innovation of the bank's technology, such as internet banking, SMS banking, and all the products that customers can use on a mobile phone. However, Tahir et al. (2018) argue an insignificant relationship between innovation and deposit growth.

Parameswar et al. (2017) stated that banks should continuously improve their communication technology and adopt new payment and financial solutions to become profitable in the long run. When the technology changes, the deposit on the accounts is consistently the first change on the customers' side. There is a need to look inside the connection between technology and deposit growth. Booth and Dash (1977) stated that non-linear relationships provide goals in the unclear context for the banks. A non-linear relationship between innovation and deposits implies an optimal investment in innovations that maximize the deposit growth.

There are many reasons why Internet banking should be widely adopted in Vietnam. However, it seems that the scale of this service is not yet large enough to impact banks' performance significantly. In 2019, data from the State Bank of Vietnam showed that most Vietnamese, approximately 69 percent of the adult population, do not have a bank account, which is the highest rate in Southeast Asia. Vietnam had almost 19,000 ATMs and 270,000 points of sale (POS) terminals in place in 2019. Up to 99% of banks in Vietnam offer payment services via internet banking and mobile banking systems. Mobile payment is available at 47 banks, and 29 banks accept QR code payments. Vietnamese banks compete to increase bank users and get financial inclusion. Facilities demand that ATMs and POS terminals are mainly concentrated in cities. There is a lack of suitable products and services for people in remote and rural areas. Moreover, most banking transactions need to occur in physical branches due to the rule of the State Bank; they cannot be executed digitally. The challenges allow financial firms, especially banks, to innovate and bring more digital solutions that serve Vietnam's large under-banked and unbanked population. Our motivation is to focus on how innovation can affect banks' deposits in Vietnam.

We collect data from 31 commercial banks in Vietnam from 2010 to 2020. To estimate the impacts of innovations on deposit growth, we employ various estimation methods such as the Random Effects Model (REM), Ordinary Least squares (OLS), and Generalized Method of Moments (GMM). Our study generates striking results. Firstly, our finding documents a positive impact of training costs on deposit growth. It is reasonable because training and seminar develop workforce and service quality to attract more savings from the public. Moreover, our findings report that banks with mobile banking applications have 10.64% higher deposit growth than banks without mobile banking. However, R&D costs have inverse

impacts on deposit growth. Unfortunately, our findings do not determine a nonlinearity between training costs, R&D costs, and deposit growth. Our findings align with Jones et al. (2012) and Kashmari et al. (2016), Mao et al. (2019), Allen and Carletti (2006), Sarfaraz (2017), Tam and Oliveira (2016), and Di et al. (2013), and prior literature.

This research is unique because of the following reasons. Firstly, we examine a nonlinearity between innovations and Deposit growth. Our study extends Wang et al. (2021) because they employ the linear regression model to evaluate the correlation between fintech and bank deposits. The non-linear model is suitable for banks since it allows them to take advantage of the changes in financial innovations without being affected by the linear model. Secondly, our study is the first to examine the innovation in the Vietnamese banking sector quantitatively. While innovations are widely studied in emerging and developed markets, the data limitations restrain researchers from conducting this topic in Vietnam. Thus, our study is unique because we manually collect the R&D from the supplementary reports of the bank's financial statements.

Our study contributes the following implications for bank managers and policymakers to develop the banking sector sustainably. Firstly, the rapid emergence of various electronic banking platforms has impacted the operations of banks. Adane et al. (2021) indicate that the appearance of automated teller machines (ATM) and mobile banking applications have decreased the number of customers using traditional banking methods. Financial innovation strategies that are effectively adopted have some positive effects on banking efficiency on banks' cost-oriented and Internet-based innovation strategies. Financial innovation fosters competitive advantages to attract more deposit growth. Moreover, financial innovations also improve risk management, product diversification, capital allocation efficiency, and economic growth. Our study recommends that banks should develop mobile banking applications, workforce, and service quality via training and development programs. Our findings are helpful for bank managers in Vietnam and other emerging markets.

Our research is structured as follows. Section 2 provides the literature review. Section 3 describes an overview of the data used in the study. Section 4 provides empirical analysis and discussion, and section 5 concludes with the study's implications.

1. LITERATURE REVIEW

1.1 Deposit growth

In the recent decade, banks have played a significant role in the banking industry with many issues related to the banks, such as channel deposit in monetary policy by Drechsler et al. (2017). Specifically, the banking industry brings many services to customers through deposits and loans. However, one of the prominent roles of the banks is to serve the demand deposits of many firms, corporates, and customers. Ivanovic (2016) examine the monthly Monetary and Financial Statistics data of Banco de Portugal from 2007 to 2013. They report that the deposit growth in the banking sector depends on different purposes, but deposits still have a crucial role in the banks. Abubakar (2014) also reports that the increase in bank deposits is a core dimension of the banking industry, as explained by the saving and consumption theory.

1.2 Innovation and Deposit growth

1.2.1 Training costs and deposit growth

Jones et al. (2012) report that training and development are the most critical factors banks must consider when developing e-banking to attract customers. In addition, Mirza et al. (2012) indicate that banks saved more costs and time by planning and implementing the training evaluation process. Kashmari et al. (2016) indicated the amount of banking facilities and the number of ATMs that a bank has been

associated with increasing its deposits. Therefore, we propose the following hypothesis to test the relationship between training costs and deposit growth:

Hypothesis 1: Training costs have a positive impact on Deposit growth.

1.2.2 R&D costs and deposit growth

Due to the modernization of banking technology, banks have started to invest in R&D development to improve their operations and provide more personalized banking services to their customers. Although new financial innovations are not granted patent protection, they can be commonly used concerning certain developments. Innovations have driven the industry's performance due to their potential to enhance the end users' experience. Innovations could help financial institutions fulfill their functions and deliver growth. However, it can also cause the economy to suffer if it is not correctly used. Banks must adopt the proper tools and procedures to ensure that new technologies are used correctly. Mao et al. (2019) found the negative effect of R&D costs on deposit growth. Banks offer customers a lower saving rate for online saving accounts, which is less attractive for deposit growth. Allen and Carletti (2006) pointed out that financial development reduces information asymmetry between banks and customers, reducing the saving interest rate to reflect lower capital raising the risk.

Fatima et al. (2018) suggest that R&D activities positively impact banking performance. Emmanuel et al. (2019) figured out that R&D activities significantly affect deposit growth. It also brings new products and technologies that improve the quality and value of the institution. Therefore, we propose the following hypothesis to test the relationship between R&D costs and deposit growth:

Hypothesis 2: R&D costs have a negative impact on deposit growth.

1.2.3 Mobile banking and deposit growth

Shaikh and Karjaluoto (2015) found a negative relationship between mobile banking and deposit growth. They stated that mobile banking was complicated and unfriendly for users to get used to. Customers had to learn from the start and were already familiar with traditional banking services. Moreover, commercial banks introduce payment services via innovative banking applications, motivating customers to spend rather than save money. Therefore, mobile banking applications' implementations reduce commercial banks' deposit growth.

On the other hand, Di et al. (2013), Tam and Oliveira (2016) and Sarfaraz (2017) report the positive impacts of mobile banking on deposit growth. Mobile banking empowers users to be more active and lets them pay or shop online. Therefore, they must deposit money into current accounts to conduct online payments, increasing the deposit growth. Mobile banking application is portable and, with proper support, can be a friendly transaction method, enabling users to open online saving accounts instantly with flexible saving terms and amounts. Therefore, mobile banking certainly attracts saving and deposits from customers.

As prior studies document mixed impacts of mobile banking on deposit growth, we propose the following hypothesis:

Hypothesis 3: Mobile banking has a positive impact on deposit growth.

2. DATA AND METHODOLOGY

2.1 Data

We collect data from financial statements and notes to the financial statements of 31 commercial banks in Vietnam. Our sampling period is from 2010 to 2020 due to the data collection limitation. Before 2010, unlisted and private commercial banks were not required to publish their financial statements. After 2010, The State Bank required that banks in Vietnam need to update their financial statements regardless

they were listed on the stock exchange or not. To mitigate extreme values issues, we follow Duong et al. (2021) to winsorize all variables at the 5% and 95% levels. We also follow Duong et al. (2022) to remove observations that do not have enough data to calculate relevant variables. Our final sample has 296 annual observations of 31 commercial banks from 2010 to 2020.

2.2 Variable definitions

The variables discussed in our study include Deposit growth, R&D costs, training costs, mobile banking, control variables, bank liquidity, bank size, and macroeconomic factors. All these variables are discussed in Appendix A.

Appendix A. Variable definitions

Variables	Acronyms	Formulas	Reference
Dependent variable			
Deposit growth	DP	$$\frac{Total\ deposit_{\ t} - Total\ deposit_{\ t-1}}{Total\ deposit_{\ t-1}}$$	Ivanovic (2016)
Independent variables			
R&D cost	RD_COST	Computer software	Fatima et al. (2018)
Training cost	TN_COST	Training expenditures data come from the financial statement notes.	Jones et al. (2012)
Mobile banking	MOBI	If the bank did not have a mobile banking system, MOBI = 0; else, MOBI = 1	Di et al. (2013)
Control variables			
Control variables	CONTROL	The total of all control variables	
Liquidity	LIQUID	Liquid assets to total asset ratio	Barth et al. (2003)
Inflation	INFLA	Obtained from website worldbank.org	John et al. (2001)
GDP	GDP	Obtained from website worldbank.org	Tan et al. (2012)
Interest rate	INTERTEST	Collect from the website webgia.com	Saba Mushtaq et al. (2017)
Bank size	BSIZE	The logarithm of total assets	Laeven et al. (2016)

2.3 Research methodology

Firstly, we apply Standard Least Square estimations such as the Pooled Ordinary Least Squares (OLS), Fixed Effects Model (FEM), and Random Effects Model (REM) estimations to examine the relationship between independent variables and Deposit growth. We perform the Redundant and Hausman tests to select

the most suitable estimation method among the three. The REM is preferable. The Wooldridge test, Breusch & Pagan multiplier test, and Durbin Wu-Hausman test show problems in the result. To resolve all the problems, we perform Two-step System GMM Estimation. Roodman (2009) suggests that the GMM estimator is designed for (1) "small T, large N" Cross-sectional data; (2) a linear functional association; (3) dynamic dependence variables that are based on its previous realizations; (4) control the endogeneity within variables by using a lag of variables as an instrument; and (5) time and individual fixed effects to reduce the omitted bias issue; and (6) resolve the heteroscedasticity, autocorrelation problem in panels. We follow Roodman (2009) to apply a Two-step System GMM estimator to achieve a better outcome while minimizing potential downward and bias errors. In addition, we implemented the Arellano Bond, and Hansen tests confirmed that the model is free from autocorrelation problems and that the instruments we added are valid. We employed three econometric regression models to calculate the effect of innovation and deposit growth in all the commercial banks in Vietnam.

2.4 Model constructions

We follow Ivanovic (2016) to construct the baseline model to examine the non-linear relationship between the training costs and deposit growth. We demonstrate the formula in model 1:

Model 1: $DP_{i,t} = a + \beta_1 TN\_COST_{i,t} + \beta_2 (TN\_COST)^2_{i,t} + \beta_3 \sum CONTROL_{i,t} + a_i + a_t + \varepsilon_{i,t}$ (1)

Fatima et al. (2018) and Emmanuel et al. (2019) suggest that bank R&D costs affect commercial banks' deposit growth. We add this variable to the model to examine whether R&D costs affect deposit growth. Model 2 is as follows:

Model 2: $DP_{i,t} = a + \beta_1 RD_{COST\ i,t} + \beta_2 (RD_{COST})^2_{i,t} + \beta_3 \sum CONTROL_{i,t} + a_i + a_t + \varepsilon_{i,t}$ (2)

Finally, we follow Shaikh and Karjaluoto (2015) to construct the entire model, which investigated the impacts of the Mobi, R&D Cost, and Training Cost on deposit growth of commercial banks in Vietnam. We construct the following model:

Model 3: $DP_{i,t} = a + \beta_1 TN\_COST_{i,t} + \beta_2 RD\_COST_{i,t} + \beta_3 MOBI_{i,t} + \sum CONTROL\ a_i + a_t + \varepsilon_{i,t}$ (3)

3. EMPIRICAL RESULTS

3.1. Descriptive statistics

Table 1 presents the descriptive statistics of the research sample. Table 1 reports that the banks' deposit growth is around 23%, with a standard deviation value of 25%. The R&D costs from 0.00 to 11.92, with an average value of 7.77 and a standard deviation of around 4.38. Training costs for bank employees are reasonable costs incurred to upgrade the technical skills represented in Table 1. On the other hand, the year that mobile banking was used in the banks (MOBI) (use = 1; have not used = 0). Table 1 also shows the liquidity, interest rate, inflation, GDP, and bank size statistics.

Table 1. Descriptive statistics

	Observation	Mean	STD	Minimum	Maximum
DP	296	0.23	0.25	-0.17	2.11
RD_COST	296	7.77	4.38	0.00	11.92
TN_COST	296	3.70	4.77	0.00	11.47
MOBI	296	0.54	0.50	0.00	1.00
LIQUID	296	0.63	0.18	0.00	0.98
INTEREST	296	0.07	0.03	0.04	0.14
INFLA	296	0.08	0.09	0.01	0.32
GDP	296	0.06	0.01	0.03	0.07
BSIZE	296	14.14	0.55	12.92	15.18

Table 1 presents the sample descriptive statistics. We examine 31 commercial banks from 2010 to 2020. The data consists of 296 bank year observations. The dependent variable includes the Deposit growth of the bank (DP), and independent variables include research and development costs (RD_COST), training costs for employees in the banks (TN_COST), and the year that mobile banking was used in the banks (MOBI). Control variables include liquidity (LIQUID), interest rate (INTEREST), inflation (INFLA), GDP (GDP), and bank size (BSIZE).

3.2 Pearson Correlation Matrix

Table 2 reports the Pearson correlation matrix of variables. The coefficient correlations are moderate except for the correlation between Interest and MOBI (-0.5330), GDP, and INFLA variance (-0.836). Therefore, we examine the variance inflation factor (VIF) to test the multicollinearity issue. According to Table 2, the maximum value of VIF is 4.835, and the average is 2.239. The result is that the VIF of all variables is less than five, and there is no multicollinearity issue (Duong et al., 2020).

Table 2. Pearson Correlation Matrix

	DP	RD_COST	TN_COST	MOBI	LIQUID	INTEREST	INFLA	GDP	BSIZE	VIF
DP	1.000									
RD_COST	-0.120	1.000								1.198
TN_COST	-0.032	0.089	1.000							1.137
MOBI	-0.175	0.136	-0.128	1.000						1.673
LIQUID	0.131	0.247	0.073	-0.030	1.000					1.125
INTEREST	0.276	-0.034	-0.145	-0.533	0.133	1.000				2.334
INFLA	0.025	0.107	-0.024	0.036	0.186	0.237	1.000			4.835
GDP	-0.073	-0.044	0.022	-0.076	-0.160	0.027	-0.836	1.000		4.384
BSIZE	-0.146	0.283	0.155	0.141	0.040	-0.301	0.015	-0.034	1.000	1.227

This table consisted of the correlation coefficients of all variables of our analysis. The data sample was gathered from 31 Commercial banks in Vietnam from 2010 to 2020. Furthermore, VIF is examined to test the collinearity.

3.3 Results from OLS and REM estimations

Table 3 reports the estimated results of identifying Vietnamese commercial banks' deposit growth. After using required tests such as the Hausman test, Chow test, and Test Lagrange Multiplier, we use the Random Effects Model (REM) in model 1, model 2, and Ordinary Least Square the model 3. In Model 1, there is a non-linear relationship between TN_COST and deposit growth. The more the training cost is, the more deposit growth increases. However, spending too much training costs on training courses and

seminars reduces bankers' working performance, which also reduces the deposit growth. Model 1 suggests the optimal training costs are around 5.08 billion VND, equivalent to 221,000USD to archive the optimal Deposit growth. This result is consistent with Kashmari et al. (2016). Model 2 indicates that the relationship between RD_COST and deposit growth is not non-linear because the coefficient of RD_COST and RD_COST2 are statistically insignificant. However, Model 3 indicates an inversed relationship between RD_COST and deposit growth. The impact of MOBI on deposit growth is statistically insignificant. Finally, table 3 reports that R-squared ranges from 15% to 17%. It implied that the variation of independent factors explains 15% to 17% variation of the dependent variable.

Table 3. Panel Least Squares Regression Results

	Model 1 (REM)	Model 2 (REM)	Model 3 (OLS)
TN_COST	0.0732**		0.0019
	(0.023)		(0.546)
TN_COST2	-0.0072**		
	(0.025)		
RD_COST		0.0085	-0.0064*
		(0.759)	(0.065)
RD_COST2		-0.0016	
		(0.552)	
MOBI			0.0237
			(0.506)
LIQUID	0.1979**	0.2423***	0.1644**
	(0.019)	(0.006)	(0.043)
INTEREST	2.8816***	2.8884***	3.2398***
	(<0.001)	(<0.001)	(<0.001)
INFLA	-1.2624***	-1.2067***	-1.2923***
	(<0.001)	(<0.001)	(<0.001)
GDP	-9.7045***	-9.3433***	-9.9723***
	(<0.001)	(<0.001)	(<0.001)
BSIZE	-0.0217	-0.0063	-0.0089
	(0.570)	(0.875)	(0.747)
N	296	296	296
R-squared	0.1773	0.1769	0.1538
Adjusted R-squared	0.1573	0.1569	0.1302
F-statistic	8.8679	8.8444	6.5191
Prob(F-statistic)	(<0.001)	(<0.001)	(<0.001)

This table represents the Least Squares regression results of deposit growth's determinants. Data collected from 31 commercial banks from 2010 to 2020 consist of 269 observations. The dependent variable includes the Deposit growth of the bank (DP), and independent variables include research and development costs (RD_COST), training costs for employees in the banks (TN_COST), and the year that mobile banking was used in the banks (MOBI). Control variables include liquidity (LIQUID), interest rate (INTEREST), inflation (INFLA), GDP (GDP), and bank size (BSIZE). P-value in the parentheses *, **, *** represent statistical significance at 1%, 5%, and 10% level.

3.4 Main results and discussions

Ullah et al. (2018) argue that OLS and REM are ineffective because of violating the hypothesis and are related to the incidental parameters problem. Therefore, we employ the two-step system Generalized Method of Moments (GMM) estimation to overcome endogenous issues (Ullah et al., 2018). We report the estimation results from the GMM method in table 4.

In model 1, we found no non-linear relationship between Training Cost and Deposit growth. Model 1 also reports an insignificant impact of training costs on deposit growth. Moreover, model 2 fails to report a nonlinearity between R&D costs and deposit growth. Model 3 documents a positive relationship between training cost and deposit growth. Our finding suggests that a 1% increase in the training costs leads to a 0.015% increase in deposit growth. Training courses and seminars improve the service and workforce quality for the entire banking system. Therefore, commercial banks with better consumer services enjoy higher Deposit growth in the competitive market. Our findings align with Jones et al. (2012) and Kashmari et al. (2016). Our finding supports hypothesis 1, indicating a positive impact of training costs on deposit growth.

Model 3 reports a negative and significant relationship between R&D costs and Deposit growth. Our finding implies that a 1% increase in R&D costs reduces the deposit growth by 0.01%. Mao et al. (2019) suggest that consumers receive a lower saving rate for online saving products, which is less attractive for Deposit growth. Allen and Carletti (2006) pointed out that financial development reduces information asymmetry between banks and customers, reducing the saving interest rate to reflect lower capital raising the risk. While our finding aligns with Mao et al. (2019), Allen and Carletti (2006), it is inconsistent with Fatima et al. (2018). Our finding supports hypothesis 2, indicating a negative relationship between R&D costs and deposit growth.

Model 3 documents a positive relationship between Mobile banking applications and deposit growth. Our findings indicate that banks with mobile banking have 10.64% higher deposit growth than banks without mobile banking applications. Banks introduce flexible online saving and payments services, which attract customers' savings and deposits. Although our finding aligns with Sarfaraz (2017), Tam and Oliveira (2016), and Di et al. (2013), it is inconsistent with Shaikh and Karjaluoto (2015). Our finding also supports hypothesis 3, indicating a positive impact of mobile banking on deposit growth.

Table 4. Regression Results from The Two-Step System GMM Method

	Model 1	Model 2	Model 3
DEPENDENT VARIABLE (-1)	0.098***	0.2088***	0.1340***
	(16.583)	(10.827)	(4.898)
TNCOST	0.0580		0.0150***
	(0.238)		(0.010)
TNCOST2	-0.0038		
	(0.434)		
RDCOST		0.0213	-0.0102**
		(0.461)	(0.026)
RDCOST2		-0.0031	
		(0.275)	
MOBI			0.1064*
			(0.095)
LIQUID	0.0665	0.0919	0.1111
	(0.391)	(0.564)	(0.396)
INTEREST	2.6489**	3.9041***	3.7435***
	(0.022)	(0.004)	(0.007)
INFLA	-1.3064**	-1.8506***	-1.6455***
	(0.025)	(0.001)	(0.009)
GDP	-13.3129***	-12.9075***	-12.3213***
	(<0.001)	(<0.001)	(<0.001)
BSIZE	-0.0410	0.2501	0.0187

	(0.769)	(0.124)	(0.876)
Cross-section fixed (first differences)	Yes	Yes	Yes
The period fixed (dummy variables)	Yes	Yes	Yes
N	240	240	240
J-statistic	22.3861	21.2213	20.8957
Prob(J-statistic)	0.3199	0.3842	0.3426

This table represents the two-step system GMM regression results of deposit growth's determinants. Data collected from 31 commercial banks from 2010 to 2020 consist of 269 observations. The dependent variable includes the Deposit growth of the bank (DP), and independent variables include research and development costs (RD_COST), training costs for employees in the banks (TN_COST), and the year that mobile banking was used in the banks (MOBI). Control variables include liquidity (LIQUID), interest rate (INTEREST), inflation (INFLA), GDP (GDP), and bank size (BSIZE). P-value in the parentheses *, **, *** represent statistical significance at 1%, 5%, and 10% level.

The interest rate has a positive impact on deposit growth. These results are consistent with Akhtar et al. (2017) since increasing saving rates are attractive from the depositor's perspective. However, table 4 reports a negative and significant relationship between inflation and deposit growth. Table 4 also reports an inversed impact of GDP on deposit growth. The increase in GDP makes people spend more money and take fewer savings than usual to decrease deposit growth. Our finding is consistent with Horioka and Wan (2007) but contrasts with Akhtar et al. (2017).

Table 4 reports an insignificant relationship between liquidity and deposit growth. Customers prefer popular banks with reliable brand names to save money rather than focus on the bank's liquidity ratio. Therefore, liquidity is not a determinant of deposit growth. This result is consistent with Ally (2014) and inconsistent with Laeven et al. (2016).

Table 4 also reports that bank size has an insignificant impact on deposit growth. As depositors receive compulsory deposit insurance for saving money, the bank size does not affect the saving decision. While our finding is consistent with Ally (2014), it is inconsistent with Laeven et al. (2016).

CONCLUSIONS

The increasing demand for deposits from customers significantly impacts the bank's development because savings and deposits are foundations for banks to offer credit activities. Therefore, commercial banks develop their technology, workforce, and service quality to attract deposit growth. Our study examines the impacts of innovations on deposit growth of 31 commercial banks in Vietnam from 2010 to 2020.

Our study generates striking results. Firstly, our finding documents a positive impact of training costs on deposit growth. It is reasonable because training and seminar develop workforce and service quality to attract more savings from the public. Mobile banking applications attract deposits and savings because banks introduce flexible online saving and payments services. However, R&D costs have inverse impacts on deposit growth. Unfortunately, our findings do not determine a nonlinearity between training costs, R&D costs, and deposit growth. Our findings align with Jones et al. (2012) and Kashmari et al. (2016), Mao et al. (2019), Allen and Carletti (2006), Sarfaraz (2017), Tam and Oliveira (2016), and Di et al. (2013), and prior literature.

Our findings are important for bank managers in Vietnam and other emerging markets. Our findings suggest that commercial banks need to develop a strategy to support the development and exploitation of technology infrastructure to improve efficiency. Moreover, commercial banks may focus on increasing training and seminars to develop their workforce and service quality to enjoy higher deposit growth. Although the R&D and innovative banking applications discourage deposit growth, they are helpful for banks to foster their competitive advantages in the information transformation era. Finally, training and mobile banking application allow banks to diversify their products and services quality, supporting sustainable developments of commercial banks.

Although our study has a marginal contribution, it has the following limitation. Firstly, we have data limitations from 2010 to 2020 because data is not fully available before 2010. Secondly, the research mainly focuses on Vietnam, where the banking system is less developed than in emerging and developed countries. Therefore, our findings may not apply to these markets. We suggest future studies apply our idea in crossed-country analysis to generalize the reliable outcomes.

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Determinants of Audit Quality in State-Owned Enterprises Listed on the Indonesia Stock Exchange with Audit Fee as Moderating Variable

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ARTICLE INFO

ABSTRACT

This research aims to empirically examine the determinants that affect audit quality. This study also examines the role of audit fees in moderating the effect of audit tenure, audit firm size, audit report lag, and auditor specialization on audit quality. The population in this research is State-Owned Enterprises (SOE) listed on the Indonesia Stock Exchange (IDX) in the period 2017 to 2020. The sample was taken using a non-probability technique with a purposive sampling method and obtained from as many as 20 companies with a total of 80 units of analysis. This research applies panel data regression analysis and Moderated Regression Analysis (MRA). The data is processed using Eviews software. The best model in this research is the Common Effect Model (CEM). The results of the research found to indicate that audit tenure has a significant negative effect on audit quality. Audit firm size and auditor specialization have a significant positive effect on audit quality. Meanwhile, audit report lag has no significant effect on audit quality. In addition, audit fees can be moderated by strengthening the effect of audit report lag and weakening the effect of audit tenure and auditor specialization on audit quality. However, the audit fee is not able to moderate the effect of audit firm size on audit quality. This research presents the moderating variable of audit fees to be a solution to overcome the inconsistency of the influence of the independent variables on audit quality.

INTRODUCTION

Audit quality is an important issue today because auditors have a big role in improving the reliability of the company's financial reporting. The financial statements presented by management are required to

have high transparency and integrity because they can have a significant effect on financial decision-making Salehi et al., 2019). Based Statement of Financial Accounting Concepts (SFAC) No. 2 requires that the information contained in the financial statements must be presented honestly according to actual conditions, reasonable, and does not contain bias (FASB, 1980). The auditor is a party who is trusted to be able to provide guarantees for the uncertainty that may occur through the quality of the audits produced (Andriani et al., 2020). The auditor will provide validation of the fairness of the company's financial reporting through its audit report. Many parties argue that auditors are the most responsible party in assessing the reliability of the company's financial reporting (Elevendra & Yunita, 2021; Fauziyyah, 2020; Judge & Sudarno, 2019; Gemsari & Astuti, 2019; Setyawati & Apandi, 2019). The size of the role of the auditor in providing guarantees for the fairness of the company's financial statements can determine the factors that affect the quality of the audit (Salehi et al., 2019).

Given the urgency of the role of auditors, nowadays we still often encounter cases of fraud in financial statements caused by poor audit quality. One of the fraud cases involved the Arthur Andersen Public Accounting Firm (AA) in the Enron case, which is the world's largest accounting scandal due to failing to detect misstatements that occurred. The next case dragged the name of a Big Four Public Accounting Firm Ernst & Young (EY) which provided an improper audit opinion on Toshiba Corp's financial statements due to the inability to disclose material misstatements. Another case of audit failure occurred at British Telcome involving the Big Four Public Accounting Firm Price Waterhouse Coopers (PWC) because it was unable to detect profit management that had been going on for several years, instead, this case was successfully revealed by the whistleblower.

Meanwhile, fraud scandals in Indonesia are mostly dominated by State-Owned Enterprises (SOEs). BUMN is the driving force of the national economy but is ranked as the second-highest fraud case based on the results of a national fraud survey by ACFE (Association of Certified Fraud Examiner) in 2019. The proportion of losses received the most by government agencies was 48.5%, followed by state-owned companies at 31.8%, then private companies at 15.1%, non-profit organizations at 2.9%, and others at 1.7% (ACFE Indonesia, 2020). Some examples of fraud cases that drag the name of state-owned companies in Indonesia include PT Garuda Indonesia (Persero) Tbk, PT Asuransi Jiwasraya (Persero), PT Asabri (Persero), PT PLN (Persero), PT Pertamina (Persero), PT Pelabuhan Indonesia (Persero), PT Angkasa Pura II, PT Krakatau Steel (Persero) Tbk, PT Kimia Farma (Persero) Tbk and others. The involvement of auditors in these cases is the inability of auditors to detect the existence of practices of manipulating financial statements that contain material misstatements due to profit management carried out by management.

1. LITERATURE REVIEW

Audit quality is defined as the ability of an auditor to uncover fraud in the financial statements presented by management. Audit quality is a fairly complex subject, the breadth of factors that affect the quality of the audit. IFAC (International Federation of Accountants) developed a framework for audit quality in IAASB (International Auditing and Assurance Standards Board). The work describes the key elements that make up the quality of the audit including inputs, processes, and outputs as the main elements. Meanwhile, its supporting elements include interaction and contextual factors. In this study, the variables studied were selected based on the relevance of key elements in the framework for audit quality (IAASB, 2014).

In the input element, the auditor must show appropriate values, ethics, and attitudes, and the auditor is required to have sufficient expertise and experience in carrying out audit activities. In this study, the input elements were represented by auditor specialization variables. Specialization auditors are auditors who have high experience and competence in conducting audit procedures in a particular industry. Specialist auditors are believed to be more effective in detecting client business risks and risks of misrepresentation of financial statements because auditors have clear industry benchmarks (Ishak et al., 2015). In addition, according to Yuan et al. (2016) specialist auditors can provide better audit quality when compared to non-specialist auditors because specialist auditors have adequate experience because they have

audited many clients in industry. Specialist auditors also have a deep understanding of business characteristics, accounting rules, as well as proper audit procedures of an industry so that the selection of auditors increases the effectiveness and efficiency of the business (K. D. Sari, 2018).

The second element is the process by which auditors in carrying out their duties must implement strict audit procedures and comply with applicable audit regulations and standards. In this study, the process elements were represented with firm-size audit variables. Firm size audit is a large size of a Public Accounting Firm that cooperates with entities to provide its audit services which are viewed based on their affiliation with the Big Four or Non-Big Four. Big Four accounting firm has better audit quality when compared to Non-Big Four (Dong Yu, 2009). In line with this opinion, Nurintiati & Purwanto (2017) stated that the size of the firm's audit is that the level of independence of the public accountant is considered to be even greater. The consistency of this according to Muliawan & Sujana (2017) high quality of audits produced by Big Four accounting firms is because auditors apply quality control standards and carry out strict audit procedures. The Big Four accounting firm also has greater incentives so that it holds greater responsibility for the incentives received to maintain their reputation (Salehi et al., 2019). Therefore, companies that cooperate with Big Four accounting firms are believed to have high credibility for the quality of their financial reporting (Kharuddin et al., 2021).

The third element is the output, where the output of the audit process is an audit report, in this element the auditor must present the audit report in a complete, clear, and timely manner so that it can be useful for users. In this study, the output element was represented by the audit report lag variable. Audit report lag is a delay in audit reporting, the length of time for completing an audit conducted by an auditor is calculated from the end date of the accounting period to the date the audited financial statements are issued. Delays in audit reporting are an important issue for investors because long delays will reduce the usefulness of financial statements (Lai, 2019). Financial information must meet the qualitative characteristics of accounting information, namely relevance, representation, comparability, verifiable, timely and, understandability. Public companies are required to submit annual reports no later than the end of the fourth month after the end of the accounting financial year, which is regulated in the Financial Services Authority (OJK) Regulation number 29 / POJK.04 / 2016 concerning Annual Reports of Issuers or Public Companies. Alkhatib & Marji (2012) argues that delays in the disclosure and publication of audited financial statements can negatively impact stock market efficiency. This opinion is reinforced by research by h Rusmby & Evans (2017) were too long a time difference can have an impact on reducing the usefulness and relevance of information. This results in the information contained in it losing the ability to influence users in making decisions to reduce the quality of the audit (Abdillah et al., 2019).

The next element is the interaction that is established between auditors, management, regulators, Those Charged with Governance (TCWG), and users. Although the main responsibility for audit quality lies with the auditor, it requires support from each stakeholder to play their respective roles to create high audit quality. In this study, the interaction element was represented with the tenure audit variable. A tenure audit is the period of audit engagement between the company and the Public Accounting Firm which takes place consecutively. The length of the tenure audit period can usually affect the level of independence of the auditor (Al-thuneibat et al., 2011). The good relationship established between auditors and stakeholders should be able to accommodate better audit quality. However, audit engagements that have been established for too long are considered bad because they cause emotional connections that can reduce the quality of the audit (Martani et al., 2021). The threat of familiarity arising from excess familiarity can reduce the objectivity of auditors in carrying out audit procedures (Andriani et al., 2020). This is because it is suspected that auditors have an economic dependence on clients so that they can reduce their independence, as a result, the quality of audits will decrease.

The last element in this framework is contextual factors such as laws and regulations, corporate governance, environmental conditions, corporate human resources, and other factors that can affect the quality of the audit should also be of concern to the auditor. In this study, the elements of contextual factors were represented by the audit fee variable. The audit fee is the amount of remuneration given by the company for audit services that will be carried out by the auditor. There are no rules specifically used to determine the amount of the audit fee (Ananda & Triyanto, 2019). The flexibility of determining audit fees can be a problem because the assumptions circulating in the community state that the auditor works according to the audit fee he receives. Even the IAPI regulation No. 2 of 2016 concerning Determination

of Financial Statement Audit Services Rewards, states that the audit fee below the standard has an impact on the non-compliance of auditors in the code of professional ethics and audit standards, thus potentially causing a decrease in audit quality. Novrilia et al. (2019) state determination of audit fees does not only refer to the type of services provided but also considers the level of competence and experience of the auditor, the needs of the client, and the period required to complete the audit report.

The design of the hypothesis in this research is based on the theory of institutional logic introduced by Thornton and Ocasio in 1999 emphasizing the workings of the social world in achieving goals. The theory of institutional logic assumes that an institution will provide social actors with a contingent set of social norms by which behavior is not driven by the logic of consequences, but by the logic of conformity (Thornton & Ocasio, 2008). Each organization will constantly try to convince the public that they have carried out activities within the boundaries and social norms that exist in society. Institutional logic consists of several values that together contribute to forming a whole set of principles that explain how social actors act to achieve the goals set. The following hypotheses proposed in this study include:

H_1: Audit tenure has a significant negative effect on the quality of the audit.
H_2: Audit firm size has a significant positive effect on audit quality.
H_3: Audit report lag has a significant negative effect on audit quality.
H_4: Auditor specialization has a significant positive effect on the quality of the audit.
H_5: Audit fees moderates by weakening the effect of audit tenure on audit quality.
H_6: Audit fees moderate by strengthening the influence of audit firm size on audit quality.
H_7: Audit fees moderate by weakening the effect of audit report lag on audit quality.
H_8: Audit fees moderate by strengthening the influence of auditor specialization on audit quality.
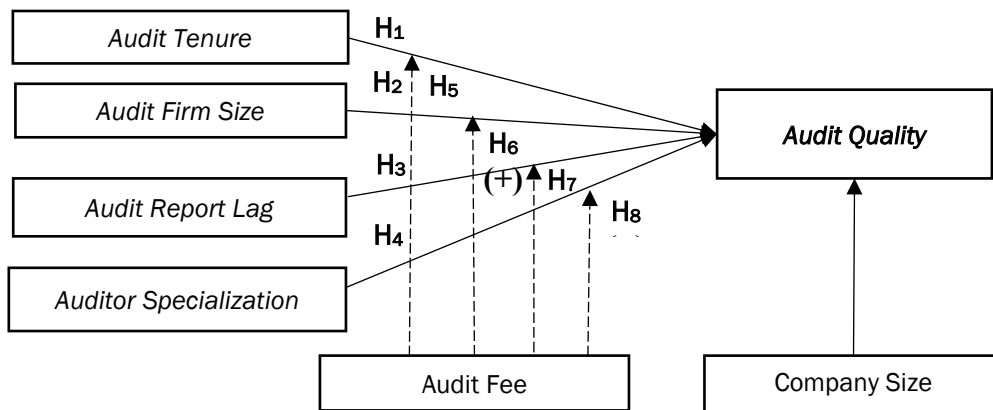
Figure 1. Research Model

Source: Processed secondary data, 2022

2. METHODOLOGY

This research uses a quantitative deductive approach with a hypothesis testing study research design. The research data used is secondary panel data sourced from an annual report on State-Owned Enterprises (SOE) companies that have been listed on the Indonesia Stock Exchange (IDX) from 2017 to 2020, published on the IDX's official website, namely www.idx.co.id. Sampling in this study was carried out using non-probability techniques with the purposive sampling method. Table 1 shows the sampling criteria.

Table 1. Population and Research Samples

Criterion	N
Number of state-owned companies registered with IDX (201 7-2020)	20
Number of companies that do not publish annual reports	(0)
Number of companies with incomplete data	(0)
The final sample of 4 years (balanced data)	80

Source: Processed secondary data, 2022

The quality of audit as a dependent variable in this study was proxied with discretionary accrual (DAC). This study examines audit tenure (TENURE), audit firm size (AFS), audit report lag (ARL), and auditor specialization (SPEC) as independent variables. Audit fee (FEE) as a moderating variable, as well as using the company size (CS) control variable. Table 2 shows the measurements of each of the research variables.

Table 2. Variable Measurement

No.	Variable	Measurement Indicators
1	Audit Quality (DAC)	Step 1. $$TAC = Net\ Income - Cash\ Flow\ from\ Operations$$ Step 2. $$\frac{TAC_{i,t}}{TA_{i,t-1}} = \hat{b}_0 \left[\frac{1}{TA_{i,t-1}}\right] + \hat{b}_1 \left[\frac{\Delta Rev_{i,t}}{TA_{i,t-1}}\right] + \hat{b}_2 \left[\frac{PPE_{i,t}}{TA_{i,t-1}}\right] + \Sigma$$ Step 3. $$NDA_{i,t} = \hat{b}_0 \left[\frac{1}{TA_{i,t-1}}\right] \hat{b}_1 \left[\frac{\Delta Rev_{i,t} - \Delta TR_{i,t}}{TA_{i,t-1}}\right] + \hat{b}_2 \left[\frac{PPE_{i,t}}{TA_{i,t-1}}\right]$$ Step 4. $$DAC = \frac{TAC_{i,t}}{TA_{i,t-1}} - NDA_{i,t}$$
2	Audit Tenure (TENURE)	Tenure = Σ years the company is audited by a consecutive public accounting firm.
3	Audit Firm Size (AFS)	Big Four = 1 Non-big Four = 0
4	Audit Report Lag (ARL)	ARL = date of audit report – closing date of accounting book
5	Auditor Specialization (SPEC)	Market Share = (Σ KAP clients in industry / Σall issuers in the industry) Market share $\geq$ 15% = 1 Market Share < 15% = 0
6	Audit Fee (FEE)	Audit Fee = Ln (Audit fee)
7	Company Size (CS)	Company Size = Ln (Total Assets)

Source: Processed secondary data, 2022

Data processing using descriptive analysis methods and inferential statistical analysis through panel data regression analysis and moderated regression *analysis (MRA) tests with the help of Eviews statistical software. The equation model regression panel data formed in this study is as follows:*

$$DAC = \alpha + \beta_1 TENURE_{it} + \beta_2 AFS_{it} + \beta_3 ARL_{it} + \beta_4 SPEC_{it} + \beta_6 TENURE_{it}*FEE_{it} + \beta_7 AFS_{it}*FEE_{it} + \beta_8 ALR_{it}*FEE_{it} + \beta_9 SPEC_{it}*FEE_{it} + \beta_{10}CS_{it}*FEE_{it} + €_{it}$$

Description:

DAC = Audit quality
α = Constants
β = Coefficient
TENURE = Audit tenure
AFS = Audit firm size
ARL = Audit report lag
SPEC = Auditor specialization
FEE = Audit fee
CS = Company size
€ = Error term
i = Cross-section data (company)
t = Time-series data (year)

3. RESULTS AND DISCUSSION

Descriptive Statistical Analysis

The descriptive statistical analysis in this study uses minimum, maximum, mean, median, and standard deviation values to describe each variable to be tested. The results of the descriptive analysis of this study are presented in Table 3 as follows:

Table 3. Descriptive Statistical Analysis Results

	Dac	TENURE	AFS	ARL	SPEC	FEE	Cs
Mean	0.542187	0.411060	0.675000	1.775927	0.775000	1.337414	31.47161
Median	0.412410	0.477120	1.000000	1.822805	1.000000	1.337575	31.68558
Maximum	1.940450	0.903090	1.000000	2.292260	1.000000	1.395740	34.95208
Minimum	0.015620	0.000000	0.000000	1.176090	0.000000	1.290900	24.55051
Std. Dev.	0.475787	0.304113	0.471330	0.235058	0.420217	0.023847	2.309706
Observations	80	80	80	80	80	80	80

Source: Processed secondary data, 2022

Panel Data Regression Analysis

Model estimation is a mandatory stage in panel data regression, this stage aims to determine the most appropriate regression model among the three available models. The three regression model estimates include the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). The estimation results of the regression model using the arithmetic log transformation data are shown in table 4.

Table 4. Panel Data Regression Analysis Results

Panel A. DAC = -2.814456 + 0.345766 TENURE - 0.417848 AFS + 0.099437 ARL - 0.501909 SPEC + 3.862703 FEE - 0.055190 CS + €$_{it}$

Variables	Coefficient	Std. Error	t-Statistics	Prob.
C	-2.814456	3.490324	-0.806360	0.4227
TENURE	0.345766	0.184966	1.869355	0.0656*
AFS	-0.417848	0.140811	-2.967443	0.0041**
ARL	0.099437	0.222225	0.447459	0.6559
SPEC	-0.501909	0.120458	-4.166669	0.0001
FEE	3.862703	2.923538	1.321243	0.1905
CS	-0.055190	0.028070	-1.966134	0.0531*

Adj^{R2} = 0.318561, F = 7.155196; p value = 1%***, 5%**, 10%*, N = 80

Panel B. DAC = 2.936627 + 0.020123 TENURE + 0.191357 AFS + 0.041654 ARL - 0.267247 SPEC - 2.896143 FEE + 0.046855 CS + €$_{it}$

Variables	Coefficient	Std. Error	t-Statistics	Prob.
C	2.936627	7.653172	0.383714	0.7027
TENURE	0.020123	0.150970	0.133293	0.8945
AFS	0.191357	0.119346	1.603385	0.1147
ARL	0.041654	0.212844	0.195704	0.8456
SPEC	-0.267247	0.103485	-2.582464	0.0126**
FEE	-2.896143	5.177878	-0.559330	0.5782
CS	0.046855	0.147089	0.318550	0.7513

Adj^{R2} = 0.826420, F = 16.04490; p value = 1%***, 5%**, 10%*, N = 80

Panel C. DAC = 0.094844 - 0.039067 TENURE + 0.221580 AFS + 0.098642 ARL - 0.321466 SPEC + 1.576605 FEE - 0.054677 CS + €$_{it}$

Variables	Coefficient	Std. Error	t-Statistics	Prob.
C	0.094844	4.468234	0.021226	0.9831
TENURE	-0.039067	0.139883	-0.279281	0.7808
AFS	0.221580	0.108792	2.036724	0.0453**
ARL	0.098642	0.182656	0.540040	0.5908
SPEC	-0.321466	0.096260	-3.339549	0.0013*
FEE	1.576605	3.638206	0.433347	0.6660
CS	-0.054677	0.042606	-1.283334	0.2034

Adj^{R2} = 0.120258, F = 2.799836; p value = 1%***, 5%**, 10%*, N = 80

Panel D.

Breush Pagan	-0.1107
Both	-0.0506

Note: All regression assumptions have been met; therefore, there are no problems with normality, multicollinearity, and heteroskedasticity. Panel A presents the results of regression analysis with the Common Effect Model (CEM). Panel B presents the results of the Fixed Effect Model (FEM) regression analysis. Panel C presents the results of the Random Effect Model (REM) regression analysis. Panel D presents the results of the Lagrange Multiplier Test, and the Common Effect Model was selected as the best model.

Source: Processed secondary data, 2022

The classical assumption tests carried out in this study include normality tests, multicollinearity tests, and heteroskedasticity tests. Although the Common Effect Model (CEM) is not required for normality tests, in this study, testing is still carried out. Figure 1 presents the output of the normality test results which showed that a probability value of 0.054948 > a Sig. of 0.05 was obtained. Based on such outputs it can be concluded that the data is normally distributed.
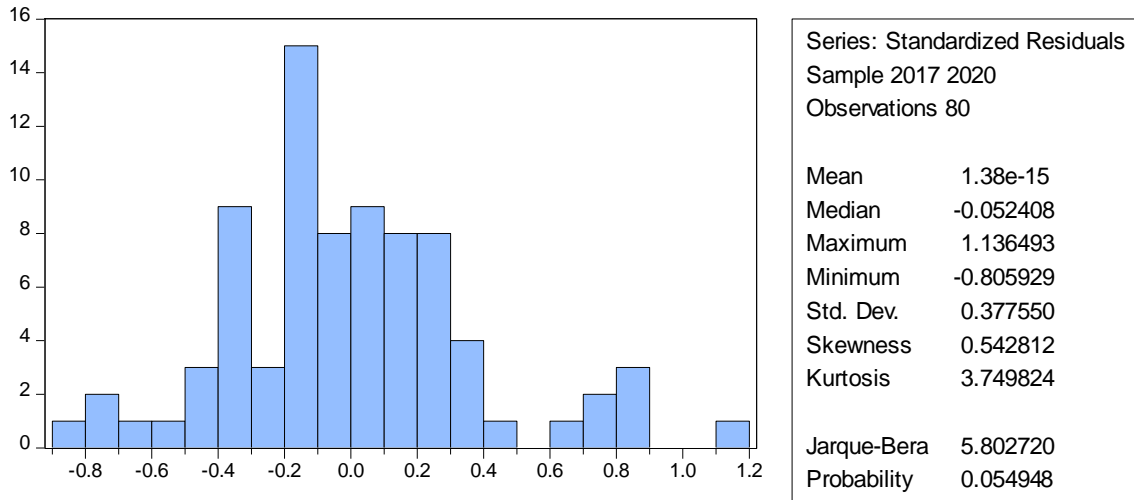
Figure 2. Normality Histogram Chart

Source: Processed secondary data, 2022

The next classic assumption test is the multicollinearity test, the test aims to ensure that there is no correlation between independent variables. The multicollinearity test in this study is shown in Table 4. It can be seen that the correlation between independent variables under the predetermined value is 0.85. So, it can be concluded that the regression of panel data in this study did not have a multicollinearity problem.

Table 5. Multicollinearity Test

	TENURE	Afs	ARL	SPEC	FEE	Cs
TENURE	1.000000	0.520478	-0.220955	0.305315	0.435949	0.464492
AFS	0.520478	1.000000	-0.158162	0.393051	0.665622	0.284660
ARL	-0.220955	-0.158162	1.000000	-0.072820	-0.126392	-0.484922
SPEC	0.305315	0.393051	-0.072820	1.000000	0.443925	0.331302
FEE	0.435949	0.665622	-0.126392	0.443925	1.000000	0.520947
CS	0.464492	0.284660	-0.484922	0.331302	0.520947	1.000000

Source: Processed secondary data, 2022

The next classical assumption test is the heteroskedasticity test, this test aims to ensure that the residual has the same variant between one observation and another (homoscedasticity). There are several types of testing in conducting heteroskedasticity tests. In this study, the test was carried out using the Glejser test which can be seen in Table 6. Based on statistical tests carried out, it shows that the probability values of all variables during the Glejser test > sig. 0.05. So, it can be concluded that the panel data regression model in this study is free from the problem of heteroskedasticity

Table 6. Heteroskedasticity Test

Variables	Coefficient	Std. Error	t-Statistics	Prob.
C	2.247171	1.887233	1.190723	0.2376
TENURE	-0.184906	0.100012	-1.848849	0.0685
AFS	0.187333	0.076137	2.460464	0.0662
ARL	0.187263	0.120158	1.558477	0.1234
SPEC	-0.281314	0.065132	-4.319121	0.1780
FEE	-1.836938	1.580770	-1.162053	0.2490
CS	0.010469	0.015178	0.689731	0.4926

Source: Processed secondary data, 2022

This study uses the moderating audit fee variable, therefore moderated Regression Analysis (MRA) testing is needed to find out how the role of audit fees in moderating the relationship of tenure audits, firm size audits, audit report lags, and auditor specialization to audit quality.

Table 7. Moderated Regression Analysis (MRA) Test Output Results

Variables	Coefficient	Std. Error	t-Statistics	Prob.
C	-2.814456	3.490324	-0.806360	0.4227
TENURE	0.345766	0.184966	1.869355	0.0656
AFS	-0.417848	0.140811	-2.967443	0.0041
ARL	0.099437	0.222225	0.447459	0.6559
SPEC	-0.501909	0.120458	-4.166669	0.0001
TENURE*FEE	-26.59085	8.717296	-3.050355	0.0031
AFS*FEE	4.384766	6.978727	0.628305	0.5317
ARL*FEE	19.80269	8.748344	2.263593	0.0265
SPEC*FEE	-17.70712	5.277301	-3.355336	0.0012
CS	-0.055190	0.028070	-1.966134	0.0531

Source: Processed secondary data, 2022

Negative Effect of Tenure Audit on Audit Quality

The value of the independent variable regression coefficient audit tenure is 0.345766 with a significance of 0.0656 (<sig 0.1) which means that the tenure audit has a positive influence on discretionary accruals or has a negative relationship with audit quality. Based on these results, it can be concluded that H_1 was accepted because the tenure audit had a significant negative effect on the quality of the audit. The results of this study are in line with an institutional logic theory which assumes that based on managerial logic, it forms a management system that is oriented toward goals and results. Where managerial values emphasize the efficiency and effectiveness of performance as well as the fulfillment of the public interest. This theory implies that auditors as independent parties have the main goal of increasing the reliability of the company's financial reporting. To achieve these results, auditors will try to improve the efficiency and effectiveness of their performance by avoiding things that can reduce their independence. Audit engagement for too long can undermine the independence of auditors because it can trigger a threat to literacy. The results of this research reinforce empirical evidence from research (Nurintiati & Purwanto, 2017; Pramaswaradana & Astika, 2017; Siahaan & Simanjuntak, 2020; Sutani & Khairani, 2018; Wicaksono & Purwanto, 2021) that states that tenure audits negatively affect audit quality. This is because the longer the audit engagement period that is established triggers emotional closeness between the auditor and the management which is feared to reduce the objectivity of the auditor in carrying out his audit procedures.

Positive Effect of Firm Size Audit on Audit Quality

The value of the independent variable regression coefficient audit firm size (AFS) of -0.417848 with a significance of 0.0041 (<sig 0.05) which means that firm size audits have a negative influence on discretionary accruals or have a positive relationship to audit quality. Based on these results, it can be concluded that H_2 was accepted because the firm size audit had a significant positive effect on the quality of the audit. The results of this study are in line with the theory of institutional logic which assumes that based on professional logic the size of an organization depends on its professional judgment and the standards of the rules it adheres to. This theory implies that the Big Four accounting firm is believed to have a good professional reputation in society. The reputation demonstrates public recognition of the Big Four accounting firm's ability to produce higher audit quality. The assessment is based on the fact that the Big Four Public Accountants have competent human resources and good quality control standards. Such professional status can carry the auditor's reciprocal obligation to fulfill the social contract by protecting the interests of the public. The results of this research reinforce empirical evidence from research (Alareeni, 2018; Andriani et al., 2020; Faisal, 2019; Gemsari & Astuti, 2019; Salehi et al., 2019) states that firm size audits have a positive effect on audit quality. This is because the larger the firm size audit, the greater the level of independence of public accountants (Nurintiati & Purwanto, 2017).

Positive Effect of Audit Report Lag on Audit Quality

The value of the independent variable regression coefficient audit report lag (ARL) of 0.099437 indicates a positive direction toward discretionary accruals or indicates a negative direction toward audit quality with a significance value of 0.6559 (>sig. 0.1). Based on these results, it can be concluded that H_3 was rejected because the audit report lag has no significant effect on the quality of the audit. The results of this study are not in line with the theory of institutional logic which assumes that based on the logic of state law the quality of an organization depends on classical bureaucratic values such as transparency, equality, and compliance with applicable rules. This theory implies that delays in audit reporting are one of the factors that cause a decrease in audit quality. This is because auditors cannot comply with applicable regulations related to the period of publication of annual reports of public companies so this can lead to a decrease in the relevance of financial information. The results of this study tend to be more supportive of the compliance theory of Tyler (1990) because auditors are required to comply with every relevant regulation in carrying out their audit procedures. The results of this research reinforce empirical evidence from the study by Herianti & Suryani, (2016); Siahaan & Simanjuntak (2020), which state that audit report lag does not affect audit quality. This is because the average public company has complied with the Financial Services Authority (OJK) regulation number 29/POJK.04/2016 regarding the deadline for submitting audit reports.

Positive Influence of Auditor Specialization on Audit Quality

The value of the independent variable regression coefficient of auditor specialization (SPEC) is -0.501909 with a significance of 0.0001 (<sig 0. 01) which means that the auditor specialization has a negative influence on discretionary accruals or has a positive direction on the quality of the audit. Based on these results, it can be concluded that H_4 was accepted because the auditor specialization had a significant positive effect on the quality of the audit. The results of this study are aligned with the theory of institutional logic which assumes that institutions provide social actors with a set of social norms in society, in which behavior is not driven by the logic of consequences, but by the logic of conformity. The implication of this theory is that auditor specialization is a form of providing social actors who are believed to have adequate experience in auditing an industry. Specialist auditors have extensive business knowledge in the industry to be able to assess business risks or business strategies that are right for the industry. In addition, specialist auditors have clear industry benchmarks for assessing appropriate accounting policies and procedures. Specialist auditors are considered to have had conformity with the social norms that exist in society. The results of this research reinforce empirical evidence from research that states that (Kharuddin et al., 2021; Salehi et al., 2019; S. P. Sari et al., 2019) auditor specializations have a positive effect on audit quality. This is because specialist auditors have a deep understanding of an industry so that errors fees or fraud that may occur can be detected by specialist auditors.

Audit fee Moderates by Weakening the Effect of Tenure Audits on Audit Quality

The value of the regression coefficient obtained from the interaction variable between the tenure audit and the audit fee (TENURE*FEE) is -26.59085 with a significance of 0.0031 (<sig 0.01). Meanwhile, when viewed from the value of the coefficient before the tenure audit interaction, it has a regression coefficient value of 0.345766 with a significance of 0.0656 (<sig. 0.1). Both are equally significant but there are differences in the results of regression coefficients between before and after the interaction showing opposite directions so it can be said that audit fee can weaken the effect of the audit tenure on audit quality. Based on the results of the regression, it can be concluded that H$_5$ was accepted. The results of this study support the theory of institutional logic assumes that based on professional logic more explicit contracts and stronger incentives are often used to encourage professionals to achieve predetermined goals. The implications of this theory show that the greater the fee or incentive received will encourage auditors to produce better audit quality. This has been empirically proven that the provision of large audit fees can weaken the negative influence of the tenure audit on the quality of the audit. This influence is caused by the longer the audit engagement period coupled with the provision of higher audit fees, which will motivate auditors to improve their performance so that they are expected to produce quality audits.

Audit fee Moderates by Strengthening the Effect of Firm Size Audits on Audit Quality

The value of the regression coefficient obtained from the interaction variable between the firm size audit and the audit fee (AFS*FEE) was 4.384766 with a significance of 0.5317 (> sig. 0.1). Meanwhile, when viewed from the value of the coefficient before the audit interaction firm size has a regression coefficient value of -0.417848 with a significance of 0.0041 (< sig. 0.01). After the interaction, it showed an insignificant influence, so it can be concluded that the audit fee was not able to moderate the effect of the firm size audit on the quality of the audit. Based on the results of the regression, it can be concluded that H$_6$ was rejected. The results of this study do not support the theory of institutional logic which assumes that based on professional logic more explicit contracts and stronger incentives are often used to encourage professionals to achieve predetermined goals. The implications of this theory show that the greater the fee or incentive received will encourage auditors to produce better audit quality along with the increase in professional responsibility for the reputation of the Public Accounting Firm. However, empirically the hypothesis is not proven because the small amount of audit fee given to the Big Four accounting firm cannot affect the high and low quality of audits. After all, the Big Four accounting firm has no economic dependence on clients. The results of this study tend to be more supportive of the theory of competence by Spencer (1993) which implies that a reputable public accountant certainly has competent human resources, has high independence and professionalism so that it is not easily influenced by the number of incentives provided.

Audit fee Moderates by Weakening the Effect of Audit Report Lag on Audit Quality

The value of the regression coefficient obtained from the interaction variable between audit report lag and audit fee (ARL*FEE) was 19.80269 with a significance of 0.0265 (< sig. 0.05). Meanwhile, when viewed from the coefficient value before the audit interaction, the reporting lag has a regression coefficient value of 0.099437 with a significance of 0.6559 (> sig. 0.1). In terms of the level of significance before the interaction showed an insignificant influence, but after the interaction showed a significant influence. In addition, both have regression coefficient values indicating a positive direction. Thus, it can be concluded that the audit fee can be moderate by strengthening the negative influence of audit report lag on audit quality. Based on the results of the regression, it can be concluded that H$_7$ was rejected. The results of this study do not support the theory of institutional logic which assumes that based on professional logic more explicit contracts and stronger incentives are often used to encourage professionals to achieve predetermined goals. The implications of this theory show that the greater the fee or incentive received will encourage auditors to produce better audit quality. Thus, the higher the audit fee can increase the motivation of auditors to complete audit reports on time so that the quality of audits increases along with the availability of information when needed. However, empirically, this hypothesis is not proven because the higher the audit fee given, it causes the auditor's economic dependence on the client so it can reduce the level of auditor compliance with applicable rules. The results of this study tend to be more supportive of

the compliance theory by Tyler (1990) because auditors are required to comply with every relevant regulation in carrying out their audit procedures.

Audit fee Moderates by Strengthening the Influence of Auditor Specialization on Audit Quality

The regression coefficient value of the interaction variable between the auditor specialization and the audit fee (SPEC*FEE) was obtained at -17.70712 with a significance of 0.0012 (<sig. 0.01). Meanwhile, before the interaction of specialization auditors had a regression coefficient value of -0.501909 with a significance of 0.0001 (< sig. 0.01). Both are equally significant in a negative direction, but when viewed from the value of the coefficient of the interaction variable, it shows that the value of the coefficient is getting smaller or farther from zero so that it can be concluded that the audit fee can moderate but by weakening the influence of the auditor specialization on the quality of the audit. Based on the results of such regressions it can be concluded that H_8 was rejected. The results of this study do not support the theory of institutional logic which assumes that based on professional logic more explicit contracts and stronger incentives are often used to encourage professionals to achieve predetermined goals. The implications of this theory show that the greater the fee or incentive received will encourage specialist auditors to produce better audit quality. However, empirically, this hypothesis is not proven because a specialist auditor is equipped with adequate competence and experience in auditing an industry, of course, it has its audit fee standards. If the audit fee given is too high, it can cause economic dependence on the client, thereby reducing the quality of the audit. The results of this study tend to be more supportive of the theory of competence by Spencer (1993) which implies that specialist auditors have superior competence in detecting irregularities in the presentation of company financial statements because they have adequate experience in auditing various clients in the industry.

Company Size's Positive Influence on Audit Quality

Additional analysis was carried out by testing the influence of the company size (CS) control variable which showed that the regression coefficient value was obtained at -0.055190 with a significance of 0.0531 (<sig 0.1) which means that the company size has a negative influence on discretionary accruals or has a positive relationship with audit quality. Thus, it can be concluded that this research model remains fit even though it has involved control variables.

CONCLUSIONS

The study has two main contributions. First, it has been found that the factor that most affects audit quality is explained by the tenure audit variables that affect negatively and significantly. Firm size audits have a positive and significant effect. Auditor specialization has a positive and significant effect. Second, this research has found that audit fees can moderate by strengthening the influence of audit report lag variables on audit quality, weakening the influence of audit tenure variables, and auditor specialization on audit quality. However, it is unable to moderate the effect of firm-size audits on audit quality.

This research also has limitations, including the complexity of factors that affect the quality of audits which are explained by other factors that are not explained in this research model. Further research is expected to add to the variety of research models to increase the adjusted R-squared value. Second, this study only has 80 units of analysis, so it is hoped that the next research can increase the number of research analysis units to represent the entire population.

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Analysing Factors Affecting the Industrial Production Sector in Malaysia: Evidence from the Bounds Testing Approach of Cointegration

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ARTICLE INFO

ABSTRACT

The main objective of this study is to investigate the factors that affect the Malaysian industrial production sector (IPS) by using the ARDL bounds testing methodology. The analysis is conducted by applying the time series data for the 1970–2020 period. From the ARDL results, all variables significantly influence Malaysian IPS in different manners for both periods; long and short runs, except the financial development (FD) variable, which insignificantly influences IPS. This final result was verified by the ECM estimate, indicating the presence of long- and short-run relationships between IPS and its factors. Although the FD sector does not directly play a significant factor in stimulating Malaysian IPS growth, policymakers must revise their policies to enhance the role of the financial and banking sector in strengthening the IPS performance in the country. This revision can be done by running good financial services to fund and motivate investors to construct new IPS schemes and then enhance the Malaysian economy with a higher growth position in the future.

INTRODUCTION

The industrial production sector (IPS) has played a significant and crucial role in contributing to the gross domestic product (GDP) in each country (Awad et al., 2016). The contribution may depend on several factors that may make its magnitude different among countries (Sankaran et al., 2020). IPS growth mirrors economic development and performance, which differs from a country to another (Öztürk & Agan, 2017).

Malaysian IPS has been transformed since 1970 from a one-based raw material as primary export to a major export-oriented manufacturer and producer of rubber and palm oil, petroleum and natural gas (Lee, 2019). The target is to undeniably increase Malaysian IPS and gross domestic output (Bachtiar et al., 2015). With the comparative advantages of an undervalued currency and relatively cheap export products, Malaysia has attracted many foreign investments into the country, especially from Japan and the US (Choong & Khalifah, 2019). Since the early 1970s, the government has established an economic restructuring strategy, namely, New Economic Policy (NEP) and later as the New Development Policy (Thillainathan & Cheong, 2016). This strategy aimed to develop economic and IPS within training programmes to collect management and entrepreneurship skills (Thillainathan & Cheong, 2016).

Soleymani and Chua (2014) stated that Malaysian IPS has direct and significant contributions to economic growth and job creation and is significant to its investment. According to the small and medium-sized enterprise (SME) Annual Report (2018), the SME industry sector is the catalyst to economic development in Malaysia, as it contributed 38.3% to overall GDP, 17.3% to total exports and 66.2% to employment in the country in 2018. According to the Department of Statistics Malaysia (2020), nearly half of jobs (42.9%) were created in the industry sector in 2020. Thus, IPS growth is beyond doubt critical to employment rate and economic growth and remains the backbone of the economy in a country (Herman, 2015).

Malaysian IPS faces many challenges and problems. For example, Lee (2019) stated that Malaysian IPS is dealing with technological challenges that force it to adapt to technological changes to stay competitive. It focuses less on digital innovation and thus results in being incomparable in the competitive market. In view of these challenges, Prime Minister Mahathir launched Industry 4.0 in 2018 to encourage the industry sector to embrace new technologies in their IPS for productivity growth (Naidu et al., 2017). The Minister of Higher Education also stated that Malaysia faces a huge challenge of the shortage of people skilled in science, technology, engineering and mathematics. Moreover, SME Corporation Malaysia (2020) noted that SMEs are dependent on foreign workers by 39.9% and on practical students from Technical and Vocational Education and Training (TVET) by 41.4%. However, SMEs responded that most graduates from TVET do not meet industry demands due to their lack of technical skills and knowledge in technology (Mee, 2021).

Furthermore, Koen, Asada, Nixon, Rahuman and Arif (2017) affirmed that Malaysia has a growing reliance on external markets, such as the US and China. Thus, Malaysia can be easily hampered by economic external shocks. For example, China's economic slowdown and the US–China trade war that happened in 2009 caused Malaysian IPS growth to be declined; China and the US are Malaysia's largest trading partners (Tham et al., 2019).

From the discussion presented, Malaysian IPS can be driven by many factors that may affect its performance over time, such as financial development, foreign direct investment (FDI), economic stability, tax burden and export, which were selected from overall previous literature to further investigation in this study for the long period of 1970–2020. Thus, from a country-level analysis, the Autoregressive Distributed Lag (ARDL) model is used to analyse the existing cointegrating long-run equilibrium relationships between IPS with its crucial attributes.

The rest of this paper is outlined in the following manner. Section 1 presents a short review of IPS contribution to Malaysian GDP. Section 2 describes the methodology applied and the data used. Section 3 discusses the outcomes attained from the data analysis. Section 4 summarises the analysis results.

1. SHORT REVIEW OF IPS CONTRIBUTION TO MALAYSIAN GDP

This section shortly provides the trend and contribution pattern of IPS role in Malaysian GDP over the 1970–2020 study period. Malaysian IPS has contributed endlessly to GDP per capita growth over time, due to Malaysia being endowed with natural resources that have been diversifying its economy. Malaysia shifted from an agricultural economy to an industrialised economy (Hussin et al., 2017). Prior to the 1970s, IPS contributed to GDP growth, and the economy grew by 8.3%, recorded a sustained high growth before it succumbed to the Asian financial crisis in 1997 (Choong & Khalifah, 2019). Literally, IPS not only contributes to GDP growth but also exports, as the total exports escalate to 81% in 1996. However, the economy contracted by 7.5% in 1998 but recovered quickly and reached the highest 30% of GDP share contribution in 1999 and 2000; moreover, 17% rose in employment (Law, 2016). Lee (2019) found that IPS is significant in its contribution to GDP share. It may be attributed to many policies that drove up Malaysian IPS in GDP share (Sundram et al., 2018). For example, NEP 1970–1990, the National Development Policy (NDP) 1990–2000 and the National Vision Policy 2001 successfully transformed Malaysia from an agricultural sector to an industrialised export country (Yip & Nambiar, 2021). These policies were introduced for developing the sector since 1970, making IPS escalate from 13.7% to 30% in 2000 (Department of Statistics Malaysia, 2021).

Since 2004, IPS in GDP share has begun to fall consistently, until the year 2020 thereafter, IPS started to rise a little (Lee, 2019). This rise owes to the service sector, which started to boom in the year 2000, and to the introduction of the 10th Malaysia Plan, which aims to drive up real annual growth and high investment in the service sector (Sundram et al., 2018). The 10th Malaysia Plan houses the Government Transformation Programme and New Economic Model aspiration, which were performed to produce sustained economic development and structural transformation (Oluwatoyin et al., 2019). However, these transformation plans have resulted in IPS share reduction in GDP.

Furthermore, Malaysia encountered deindustrialisation, which occurred when IPS export activities declined gradually in the global market. The situation was prevailing in parallel to the increment of service sector development in Malaysia, as the service sector has been supported by the government and has become the most contributor to GDP (Baharudin, 2018). The service sector contributes 46.30% of GDP share in 2000 and rose consistently to 54.78% in 2020 (Department of Statistics Malaysia, 2021). In a different manner, IPS contribution to GDP declined substantially from 30% to 22.31% in 2020. Another key point here is that the contribution of the service sector is not only critical to GDP but also critical to Malaysian IPS due to the economic transformation and advanced technology that the country started to implement to boost Malaysian IPS in the world trade; Malaysia used the services of global value chains and global production networks for achieving good sector performance (Yip & Nambiar, 2021).

Malaysian IPS increased during the pandemic in 2019, and its share contribution in GDP rose from 21.44% to 22.3% in 2020. However, the registration of industrial value-added SMEs declined at 2.9% in 2019 and IPS for non-metallic mineral products and metal products plummeted 13.1% in 2019 (Department of Statistics Malaysia, 2021). Nevertheless, petroleum, chemical, rubber, plastic, food, and beverage industries recorded positive growth at 3.2% of the sector contribution to GDP. This positive growth was due to aggregate demand increases during the recession in Malaysia (Liew & Chan, 2018). Overall, the drive for positive IPS growth was contributed by manufacturing production, whereas mining and electrical production dropped in their contribution to the sector, reaching 9.6% and 2.1%, respectively. The reduction in mining production, among other reasons, was due to the reduction in crude oil (Awad et al., 2016).

During the COVID-19 pandemic between 2019 and 2020, the trade and geopolitical tensions overshadowed the global economy that affected Malaysian IPS (Yip & Nambiar, 2021). Malaysian economy plummeted, and unemployment rate rose, resulting in an economic recession and affecting exports (Zakaria & Basah, 2021). Due to this condition, the Malaysian government provided many subsidies to industry sectors and SME sectors for enhancing their IPS to keep improving the economic growth in Malaysia (Lee, 2019; Oluwatoyin et al., 2019).

Based on the review presented, Figure 1 shows the trend of the annual rate of IPS contribution to the GDP of Malaysia over the 1970–2020 period.
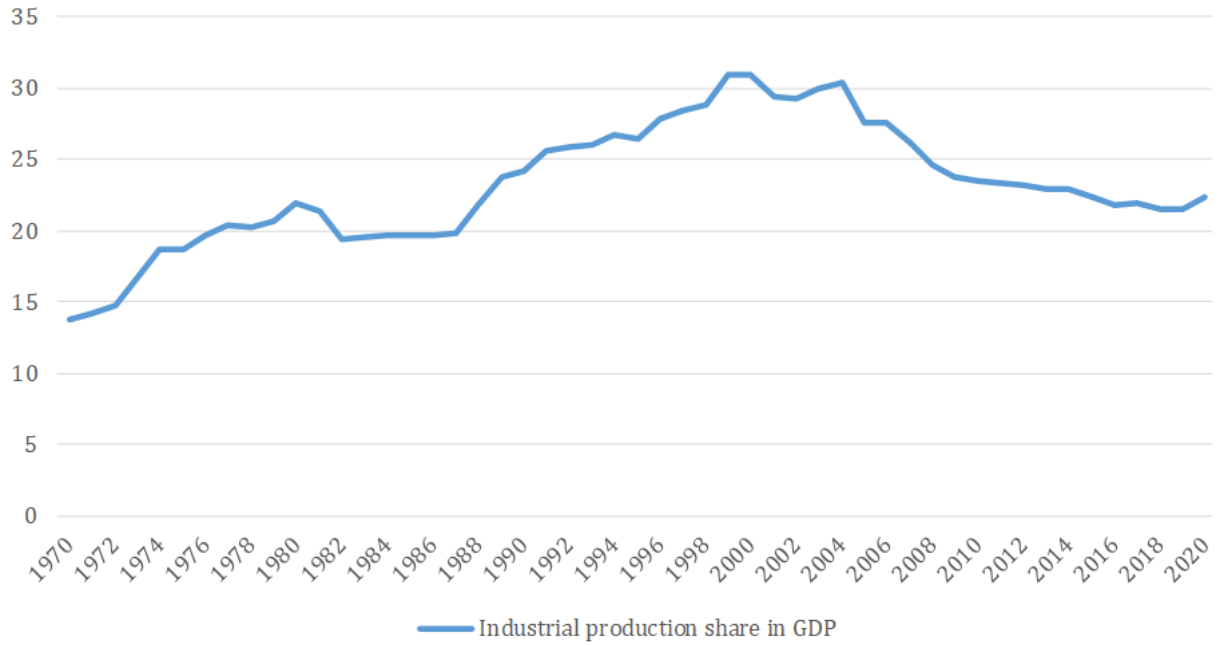
Figure 1. IPS share in Malaysian GDP: 1970-2020

Source: Prepared by the authors based on the data from World Bank (2020).

2. METHODOLOGY AND DATA

In this study, the ordinary model of IPS and its attributes in Malaysia is expressed as follows:

$$InY_t = \alpha + \beta_1 InFD_t + \beta_2 InIFDI_t + \beta_3 InTB_t + \beta_4 ES_t + \beta_5 InX_t + \varepsilon_t \qquad (1)$$

where Y_t presents Malaysian IPS at time t; FD_t is the financial development in the Malaysian economy at time t, which is measured by the credits and loans provided to private sectors; $IFDI_t$ is the inflow of FDI in the country at time t; TB_t is the overall average tax burden of the Malaysian economy at time t; ES_t refers to the economic stability in the economy at time t, which is measured by the movements of the Malaysian exchange rate over time; X_t is the volume of exports for Malaysia at time t. α is a constant, and ε_t is the disturbance term. All variables entered the model in their logarithmic forms, except for ES, which entered in its actual values. The expected signs of the coefficients of the involved variables are as follows:

$\beta_1, \beta_2, \beta_3, \beta_5 > 0$, and $\beta_4 < 0$.

As in the terms of time series data analysis, the classical unit root test by Dickey and Fuller (1979) is employed in its three forms of equations as:

Form 1: Unit root test with intercept,

$$\Delta Y_t = \hat{u}^A + \hat{\beta}^A t + \hat{a}^A Y_{t-1} + \sum_{i=1}^{k} + \hat{C}_i^A \Delta Y_{t-i} + \varepsilon_t \qquad (2)$$

Form 2: Unit root test with intercept and trend,

$$\Delta Y_t = \hat{u}^B + \hat{\beta}^B t + \hat{a}^B Y_{t-1} + \sum_{i=1}^{k} + \hat{C}_i^B \Delta Y_{t-i} + \varepsilon_t \qquad (3)$$

Form 3: Unit root test without intercept and trend,

$$\Delta Y_t = \hat{a}^C Y_{t-1} + \sum_{i=1}^{k} + \hat{C}_i^C \Delta Y_{t-i} + \varepsilon_t \qquad (4)$$

To investigate the cointegrating relationships between IPS and its explanatory variables, this study applies the ARDL bounds testing methodology pioneered by Pesaran et al. (2001). The ARDL model is autoregressive, where yt, the dependent variable, is explained by its lagged values. This model takes the

maximum number of lags to obtain the data generating process in a specific modelling framework, such as the one for this study as follows:

$$\Delta lnY_t = \beta_0 + \sum_{i=1}^{n} \beta_{1i} \ln \Delta Y_{t-i} + \sum_{i=0}^{n} \beta_{2i} \Delta \ln FD_{t-i} + \sum_{i=0}^{n} \beta_{3i} \Delta \ln IFDI_{t-i} + \sum_{i=0}^{n} \beta_{4i} \Delta \ln TB_{t-i} +$$

$$\sum_{i=0}^{n} \beta_{5i} \Delta ES_{t-i} + \sum_{i=0}^{n} \beta_{6i} \Delta \ln X_{t-i} + \delta_7 \ln Y_{t-1} + \delta_8 \ln FD_{t-1} + \delta_9 \ln IFDI_{t-1} + \delta_{10} \ln TB_{t-1} + \delta_{11} ES_{t-1} \qquad (5)$$

$$+\delta_{12} \ln X_{t-1} + \varepsilon_t$$

where Δ refers to the first difference operator, and n is the lag order. ΔlnY_{t-i} describes the changes in the lagged dependent variable. $\beta 0$ is the drift term, and εt is the residual in the model. The ARDL bounds procedure is performed on Eq. (5), allows a joint significance test of the null hypothesis of no cointegration (H0: $\delta 7 = \delta 8 = \delta 9 = \delta 10 = \delta 11 = \delta 12 = 0$) against its alternative (H1: $\delta 7 \neq \delta 8 \neq \delta 9 \neq \delta 10 \neq \delta 11 \neq \delta 12 \neq 0$) that cointegration exists. The ARDL model is used to verify the existence of long-term relationships along with short-run estimates. Therefore, the short-run dynamics for error correction in the ARDL form are represented by the terms with summation signs, whereas long-run relationships are represented by items accompanied by the parameter.

In applying the bounds testing model, this study deals with the critical values of Narayan (2005). Pesaran et al. (2001) and Narayan (2005) proved that the distribution of the Wald test (F-statistic) is nonstandard and biased because the values are generated on the basis of a large sample size. Thus, Narayan (2005) introduced two groups of critical values, which are statistically valid and constitute upper and lower bounds for all significance levels with and without a time trend. If the F-statistic is greater than the upper and lower bounds, then the null hypothesis can be rejected, which implies that long-run relationships exist among the test variables. By contrast, if the F-statistic is lower than upper and lower bound values, then the null hypothesis is accepted, which suggests that long-run relationships do not exist. However, if the F-statistic falls between upper and lower bound values, the result is inconclusive (Pesaran et al., 2001).

After specifying its long-run cointegrating relationships, the ARDL analysis is then continued to be employed for obtaining the long- and short-run estimate model. Based on Eq. (5), the coefficients of the variables of $\delta 8 - \delta 12$, normalised by $\delta 7$, represent the dynamic long-run relationships between the IPS model and its independent variables. The coefficients of the variables of $\beta_1 - \beta_6$ in their first differences represent short-run dynamic relationships. Eq. (5) provides an estimate of the short-run dynamic error correction model (ECM) as follows:

$$\Delta lnY_t = \beta_0 + \sum_{i=1}^{n} \beta_{1i} \ln \Delta Y_{t-i} + \sum_{i=0}^{n} \beta_{2i} \Delta \ln FD_{t-i} + \sum_{i=0}^{n} \beta_{3i} \Delta \ln IFDI_{t-i} + \sum_{i=0}^{n} \beta_{4i} \Delta \ln TB_{t-i} +$$

$$\sum_{i=0}^{n} \beta_{5i} \Delta ES_{t-i} + \sum_{i=0}^{n} \beta_{6i} \Delta \ln X_{t-i} + \lambda ECM_{t-1} + V_t \qquad (6)$$

From the one-period lagged for the ECM–ARDL model, ECM_{t-1} refers to the residuals obtained from the cointegrating long-run equation, as in Eq. (5), whereas λ denotes that the adjustment speed is running from short-run to long-run equilibrium. From the analysis and for a correct estimation process, the term ECM_{t-1} must obtain its features as obtaining a negative sign, less than the value of one and significant. Finally, the functionality and stability of the model must be examined through a series of diagnostic tests and stability test using the cumulative sum of recursive residuals (CUSUM) and cumulative sum of recursive residual squares (CUSUMSQ), as proposed by Brown et al. (1975).

The data used for all the variables from 1970 to 2020 are gathered from the World Bank Data indicators, except for the tax burden and IPS variables obtained from Bank Negara Malaysia.

3. EMPIRICAL RESULTS

All the analysed results attained from each test of the variables are offered in further detail in this section. The results are stated in the appendix.

3.1 Unit root and cointegration tests

As a preliminary step for conducting the ARDL model, the Augmented Dickey–Fuller (ADF) unit root test is employed for testing the stationarity properties of the series entered in the IPS model. The optimal maximum lag order at $k = 1$ is used for the ADF test, which is selected based on annual data frequency.

Table 1. ADF Test Results

Variables	T-Statistics (At Level)	T-Statistics (At First Difference)	Integration Order
Ln(Y)	-1.08**	-3.94**	I(1)
Ln(FD)	-2.04**	-6.76**	I(1)
Ln(IFDI)	-3.46**	-7.91**	I(1)
Ln(X)	-1.11**	-9.21**	I(1)
Ln(TB)	-1.11**	-9.38**	I(1)
(ES)	-3.22**	-5.68**	I(1)

Notes: 1. Critical values from MacKinnon (1996) are 3.50 and 2.92 at the 5% significance level. 2. ** indicates the 5% significance level. 3. Tests for all the variables are conducted using Eviews 12 with constant and trend.

Source: Authors' calculation

The results indicate that all series are integrated with order zero or I(0) process in their level because the null hypothesis is not rejected at the 5% significance level. However, the null hypothesis is rejected for all tested variables after taking their first differences, suggesting that all series are stationary or integrated with order on or I(1) process. From the results in Table 1, no series deals with the second order or I(2) process. The final conclusion is that ARDL can be used for testing long-run cointegrating relationships between IPS and its proposed factors. For this end, the ARDL bounds testing methodology is used by applying the optimal maximum lag order at k = 6, which is selected based on Akaike information criterion (AIC). The result of the calculated F- statistic value of 3.46 is used by comparing its critical upper bound value of 3.29, indicating that the null hypothesis of no cointegration is rejected at the 10% significance level. It suggests that the existence of long-run cointegrating relationships between IPS and its factors is verified.

Table 2. ARDL Bounds Cointegration Test Result

Model	Calculated F-Statistic	
Ln(Y)=F(Ln(FD), Ln(IFDI), ES, Ln(TB), Ln(X))	3.46**	
	K=5, N=51	
Critical value for bounds test: case III: unrestricted intercept and no trend	I(0)	I(1)
10%	2.276	3.297
5%	2.694	3.829
1%	3.674	5.019

Notes: ** refers to the 5% significance level, whereas k is the number of explanatory variables.

Source: Authors' elaboration

3.2 Long-run, short-run estimates and diagnostic tests

Panel A of Table 3 shows the estimation results for the ARDL long-run and short-run ECM associated with its diagnostic statistics tests. From the results presented in Panel A of Table 3, variables of IFDI, TB, X and ES significantly influence IPS in different directions at the 5% significance level, except for ES, which is significant at the 10% significance level. Meanwhile, FD is insignificant. This result corresponds to Zakaria and Basah (2021) who found that FD demonstrates an insignificant effect on IPS and suggested that FD is not a domain factor that has a direct effect on IPS in the long run. Moreover, the coefficient of IFDI negatively affects Malaysian IPS. This result implies that with a 1% increase in IFDI, IPS will decrease by 19% in the long run. It is consistent with Masron and Hassan (2016) who confirmed that IFDI has a negative significant influence on Malaysian IPS. It is attributed to the fact that IFDI in various sectorial outputs generating a positive effect on IPS is uncertain. Masron and Hassan (2016) found that IFDI from the US to Malaysia only has a positive effect on some classes of industries, such as tobacco, furniture and fixture and industrial chemical industries. However, a serious negative effect is observed on other industries, such as manufacturing, petroleum and coal production industry and electrical machinery production industry.

Table 3. Long- and Short-run Estimates

Panel A: ARDL (1, 6, 4, 2, 5, 5) *Long- Run Estimate Output*					
Cons	Ln(FD)	Ln(IFDI)	Ln(TB)	Ln(X)	ES
1.01	-0.26(-1.24)	-0.19(-2.41)**	0.68(3.85)**	0.44(1.75)**	-0.12(-1.53)*

Panel B: ARDL (1, 6, 4, 2, 5, 5) *Short-Run Estimate Output*							
Lag Order							
Regressors	0	1	2	3	4	5	6
ΔLn(Y)		-0.63(-3.54)**					
ΔLn(FD)	-0.63(-4.50)**	0.13(1.11)	-0.59(-4.72)**	0.06(0.55)**	-0.37(-3.87)**	-0.02(-1.53)*	
ΔLn(IFDI)	0.01(0.91)	0.09(3.41)**	0.04(2.29)*	0.07(4.12)**			
ΔLn(TB)	0.59(4.86)**	-0.23(-1.86)**					
ΔLn(X)	1.08(6.67)**	0.20(1.27)	0.70(4.86)**	0.02(0.23)	0.40(3.85)**		
Δ(ES)	0.09(3.65)**	0.05(1.58)*	0.07(2.41)**	0.10(3.05)**	-0.05(-1.83)**		

Panel C: *Diagnostic Statistics Tests*								
ECM (-1)	$\chi^2_{LM}(1)$	$\chi^2_{H}(1)$	$\chi^2_{R}(1)$	$\chi^2_{N}(6)$	ADJ.R^2	F-Sta/P.V.	CUSUMS	CUSUMSQ
-0.63(-5.7)**	0.35(0.55)	2.8(0.09)	8.7(0.31)	3.8(0.14)	0.99	0.000	S	Uns

Notes: The number in the parentheses, as in Panels A and B, refers to the coefficient value with its t-ratio in the bracket. χ^2_{LM}, χ^2_{H}, χ^2_{R} and χ^2_{N} in Panel C are the serial correlation LM test, heteroscedasticity, misspecification error and normality, respectively. ** and * refer to the 5% and 10% significance levels, respectively. The ARDL approach for cointegration is applied to the IPS model with a maximum lag of 6.
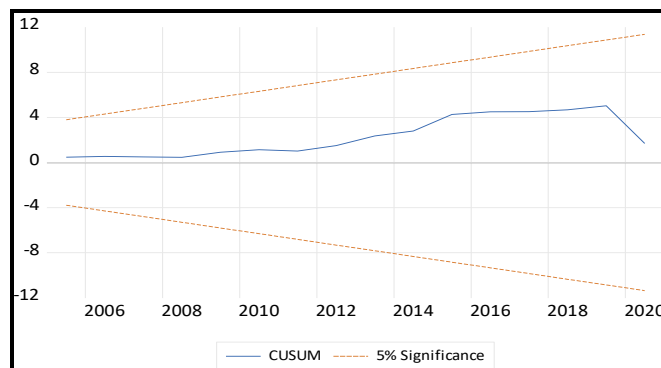
Source: Authors' calculation

Furthermore, the coefficient of TB shows a statistically positive and significant influence on Malaysian IPS. This result comes in line with Law (2016) who argued that TB has a statistically positive impact on IPS. When plausible tax burden increases by 1%, IPS increases by 68%. The logic behind this finding is that once the government revises its policies towards the investment and provides its facilities in restructuring the investment environment to be attractive with a rational taxation burden imposed on investors, investors become motivated to increase their business and be satisfied to pay their tax obligations to the relevant authority. The policy ends up with the collection of high revenues to the government and enhances its ability to fund all programmes that support IPS growth and create a positive economy to build a rise in investment in establishing MNC companies in Malaysia (Tang et al., 2013). However, if TB levies on the import duty or foreign import increases, then a positive effect on driving up Malaysian IPS competitiveness may be created due to the cheaper price of Malaysian IPS output than foreign imports, which may end up with high growth for the industries of this sector (Santheran & Geetha, 2017).

The coefficient of the X variable indicates a positive long-run effect on IPS, which implies that an increase in the demand for exports of goods and services leads to the IPS growth increase. As export demand increases by 1%, the IPS output demand in Malaysia increases by 44%. The result is supported by Yip and Nambiar (2021) who found that the global trade of Malaysia with developed and developing countries leads to a positive direct effect on IPS growth in the country. The coefficient of the economic instability variable has a negative impact on Malaysian IPS at 10% significance level. An economic instability degree in the country reduces Malaysian IPS output by 12%. This finding is consistent with Soleymani and Chua (2014) who indicated that ES has a statistically negative significant effect on IPS growth. The result may be attributed to the Malaysian currency fluctuation, which has depreciated and appreciated over the study period and affected IPS growth.

For short-run estimates, Panel B of Table 3 shows that all variables in their current and different lagged periods affect IPS performance in different directions of influence at the 5% significance level, except for some which are significant at the 10% significance level. The proposed variables drive Malaysian IPS magnitude and performance in the long and short run. The adjusted R^2 takes a considerable value that confirms the fact that Malaysian IPS variation by 99% can be interpreted within its determinant. From the results of the diagnostic tests, the model is well specified and free from any statistical problems that make it valid for IPS performance prediction in the future. From Panel C of Table 3, the result of the one-lag period of ECM shows that it has an expected negative sign and is significant at the 5% significance level, indicating that about 63% of disequilibrium in the last period must be amended towards the equilibrium in the current period. This ECM result confirms the existing long-run cointegrating relationships between IPS and its attributes in Malaysia.

As for the stability test investigation, CUSUM and CUSUMSQ tests are applied and results are reported in Panel C of Table 3.

Figure 2. Plot of cumulative sum of recursive residuals for Malaysian IPS model
Source: Authors' estimation
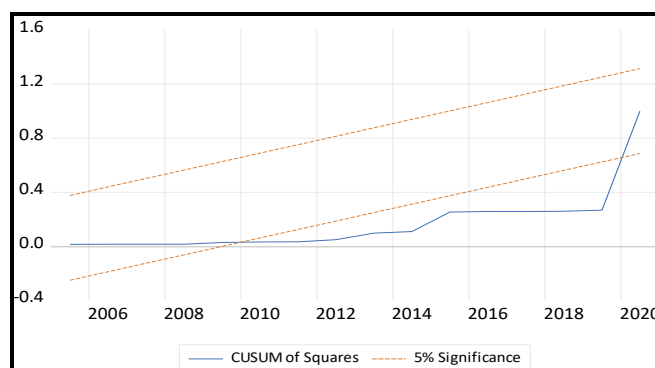
Figure 3. Plots of cumulative sum of squares of recursive residuals for Malaysian IPS model
Source: Authors' estimation

The plot of CUSUM indicates that the model is stable because the blue line is located between its red lines. However, the plot of CUSUMSQ indicates some instabilities for the IPS model from 2009 to 2018. It suggests that the residual variance of the estimated model was unstable from 2009 to 2018, indicating that the estimated model cannot be explained only by its assumed determinants. The instability may occur due to IPS growth, which started to decline when the government gave up its support to the sector for other sectors to be expanded in 2000. Therefore, the policy taken may affect IPS.

CONCLUSION

The main objective of this study was to investigate the factors that affect IPS performance in Malaysia for the 1970–2020 period. ADF test was performed for the unit root investigation, and the ARDL bounds testing approach of cointegration was used to capture the long- and short-run estimates of the IPS model. From the ARDL results, all variables significantly influenced Malaysian IPS in different manners for both periods; long and short runs, except the FD variable, which insignificantly affected IPS. This final result was verified by the ECM estimate, indicating the presence of long- and short-run relationships between IPS and its factors.

Apart from the influential roles of the proposed factors in their reactions to IPS performance in Malaysia, this study empirically ran a new mark for policymakers in the country to support IPS, thereby attracting external and domestic demands for Malaysian IPS production. Although the FD sector does not directly play a significant factor in stimulating Malaysian IPS growth, policymakers must revise their policies to enhance the role of the financial and banking sector in strengthening good IPS performance in the country. This revision can be done by running good financial services to fund and motivate investors to construct new IPS schemes.

ACKNOWLEDGMENTS

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Determinants of Sustainable Growth Rate and Market Value: Evidence from Saudi Arabia

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ARTICLE INFO

ABSTRACT

The purpose of this study is to investigate the best model to predict the effect of sustainable growth rate and its determinants on the market value through relation derived through the Gordon Growth Model equation for the Saudi banks from 2010 to 2019. By applying Higgins basic model and PRAT model, the statistical results of multiple regression show that there is a positive significant effect for growth rate, ROE, profit margin, assets turnover, and financial leverage on market value, but no effect for retention rate on market value. Furthermore, the results of stepwise multiple regression show that the best statistical model for predicting market value using the Higgins basic model contains ROE after excluding the retention rate, which explains approximately 92% of the changes in the market value of Saudi banks, and the best statistical model for predicting market value using the PRAT model contains profit margin and assets turnover after excluding the retention rate and financial leverage, which explains approximately 70% of the changes in the market value of Saudi banks. By providing a research perspective on Saudi Arabia's banking industry, this study aims to fill a gap in the literature. There was no study that investigated that relationship by applying Higgins and PRAT models.

INTRODUCTION

Many researchers have examined the relationship between financial performance measurements and market performance measurement methods in recent years, attempting to predict market value using all methods of measurement. Those studies sought to identify any market performance measures that could accurately reflect the enterprise's actual performance and thus its closest accounting performance. This study investigates the effect of components of the sustainable growth rate equation on market value. In order to demonstrate the ability of financial performance measures in the sustainable growth equation to predict market value, the study relied on previous studies that linked financial performance measurements with market value. Furthermore, this study investigates the impact of earnings retention policies on enterprise market value, which, according to previous research, is an important component of dividend payout decisions and the second component of the sustainable growth equation.

The study's goal is to establish a link between sustainable growth and its components on one hand, and market value as measured by the profitability multiplier on the other. This will help shed light on how the rate of sustainable growth affects the market value of banks operating in the Saudi banking sector. This can be thought of as a new and different way of looking for a new effect on changes in the market value of that sector. This study aims to do the following:

– Determine the possibility of predicting market value using the sustainable growth rate.
– Predicting market value using the return on equity and retention rate as components of the Higgins basic model's sustainable growth rate (Higgins, 1977, 2018).
– Forecasting market value using the detailed components of the sustainable growth rate equation, which include profit margin, asset turnover, financial leverage, and retention rate (Higgins, 1977, 2018).

The analysis of an enterprise's sustainable growth is important for both owners and creditors, because owners understand that the enterprise's value is dependent on the future growth of profits, cash flows, and dividends. Creditors are interested in sustainable growth because it reflects the success of the enterprise, which, in turn, reflects its ability to pay future obligations. Furthermore, the study's significance can be seen in its ability to provide clear evidence for financial analysts on the feasibility of using this tool in predicting the market value of Saudi bank shares if a relationship between the study variables is established. Furthermore, it is the first study (to the best of the researcher's knowledge) that investigates the possibility of predicting market value, which has not previously been measured in the local environment, using the profitability multiplier ratio and the sustainable growth rate, and applies it to the banking sector.

Concerning the study's problem, the study is designed to ask the following questions:

– Does the rate of sustainable growth affect the market value of Saudi banks?
– Do the components of the basic Huggins model influence the market value of Saudi banks?
– Do the detailed Higgins model components affect the market value of Saudi banks?

1. THEORETICAL FRAMEWORK & LITERATURE REVIEW

1.1 Sustainable growth rate and market value

According to previous studies, the market value is influenced by fundamental elements represented in financial decisions, such as financing decisions, investment decisions, dividend decisions, and accounting profits (Altahtamouni, 2018), whereas the study of (Modigliani & Miller, 1963) is regarded as one of the studies that demonstrated that the market value is influenced by financing and investing decisions. The market value of a share is determined by the following two factors:

– The cash flow's present value in the future.
– The discount rate used to discount those future cash flows.

Cash flows are what an investor will receive at the end of a period, because the value of a common stock is equal to the present value of all cash flows (dividends) that are expected to be received during that period. Although the share value is determined by expected dividends, this does not necessarily imply that the establishment can increase its value by increasing current dividends, this is due to the fact that shareholders are concerned with both current and future dividends.

Dividend payout ratio is a measure of dividend policy because it is the means by which the enterprise can recoup any surplus after investing and covering operating costs. Furthermore, dividends reflect the directors' perspectives on the company's future goals (Palepu, et.al. 2000). For example, a company that is currently distributing high profits reduces its retained earnings and reinvests its profits. As a result, future dividends and profits will be reduced. It is worth noting at this point that future dividend growth occurs as a result of increased returns and what is measured by return on share.

According to Corrado and Jordan (2005), there are several ways to estimate the future growth of dividends in the constant growth model, such as the sustainable growth rate, which uses the enterprise's

return to estimate dividend growth. This demonstrates that the growth in distributions corresponds to the growth in returns. The increase in return on share is caused by inflation, the amount of retained earnings, and the enterprise's rate of return on equity. This means that the growth in profits will play a role in the growth in dividends (Weston & Brigham, 1993). R. Higgins proposed the concept of sustainable growth in 1977. He defined it as the maximum rate at which a company's sales can be increased without exhausting all of its financial resources. He also defined it as the annual increase in sales that is consistent with the enterprise's financial policies, and Olson and Pagano (2005) explained that the sustainable growth rate is a rate that varies from year to year because the ratios on which it is calculated are not fixed. Furthermore, while this growth is described as "sustainable," it is not continuous from year to year. Furthermore, sustainable growth can be defined as the rate of increase in sales, assets, and debt, in addition to the equity that can be preserved (indefinitely) without any attempt on the part of the administration to change the relationship between debt and equity or between the performance of return on equity and the dividend payout ratio (Gallinger, 2000). Furthermore, (Platt et al., 1995) defined it as the rate at which the enterprise's sales and assets grow without causing a change in the enterprise's capital structure.

As a result, enterprises must maintain sustainable growth in order to remain profitable, engage in profitable investments, and achieve high rates of return on equity and return on assets, which measure the rate of return on investment (Yakubu et al., 2022). It can also be stated that the enterprise's growth rate is an important factor in distinguishing between enterprises that maintain their value and those that destroy it. Furthermore, understanding the sustainable growth rate will lead to understanding the extent to which the enterprise is likely to face difficulties. For example, if a company is likely to go bankrupt in the future, this can be interpreted as an indication of the company's inability to keep up with its sustainable growth for real sales growth.

Higgins (1977, 2018) developed the following equation to calculate the rate of sustainable growth (SGR) as a basic model and as a PRAT model:

SGR = ROE × Retention rate   (1)

 While ROE = profit margin × assets turnover × financial leverage
    Higgins (1977, 2018; Platt et al., 1995) used the PRAT model to express the SGR equation as follows:

SGR = P × R × A × T   (2)

These are the following ratios: P (prof it margin), R (retention rate), A (asset turnover), and T. (financial leverage). Profit margin and asset turnover both evaluate a company's operating performance. Retention rate and financial leverage, on the other hand, capture a firm's dividend policy and financing decisions (Pinto, et al, 2015). Combinations of the components of sustainable growth also provide important insights. For example, net margin multiplied by asset turnover equals return on assets, return on assets multiplied by financial leverage equals return on equity, and retention rate multiplied by financial leverage is the compound financing factor reflecting the company's compound strategies for financing operations with retained earnings and debt (Lockwood & Prombutr, 2010).

As a result, a link can be made between the enterprise's sustainable growth rate and its market value, because the enterprise's value is determined by its profits and growth. Profits and growth are determined by the effects of financial market policy and market strategy (Palepu, et.al., 2000). Analysts use the concept of sustainable growth to evaluate the enterprise's ratios in a holistic manner. Furthermore, an increase in sustainable growth is accompanied by an increase in sales and profits. This may increase the likelihood of debt repayment and reduce the risk of default.

1.2 Profitability Multiplier

Publicly traded companies always try to capture relative attractiveness in the stock market, and the firm's wealth maximization goal always drives this. However, investors attempt to assess the firm's absolute position as well as its relative attractiveness. Various valuation techniques are used by researchers,

market analysts, fund managers, and investors in this context (Dutta, et al, 2018; Setianto et al., 2022). Various valuation techniques are used by researchers, market analysts, fund managers, and investors in this context. However, the majority of them rely on the price-to-earnings ratio (P/E ratio) for valuing and evaluating individual stocks (Molodovsky 1953), where P/E ratio is a useful metric for evaluating the relative attractiveness of a company's stock price compared to a firm's current earnings. The trailing P/E ratio is commonly regarded as an indicator of expected earnings growth, but it is also influenced by transitory (unsustainable) current earnings, an effect known to fundamental analysts as the "Molodovsky effect," from Molodovsky (1953): A P/E ratio can be high due to expected long-run earnings growth, but a company with expected long-run earnings growth can have a low trailing P/E ratio because current earnings are temporarily high.

According to Dutta et al. (2018), the P/E ratio, calculated by dividing the stock price by earnings per share, is also known as "Price Earnings Multiples." The profitability multiplier is the amount of money an investor is willing to pay to make one dollar of profit (Brigham, Ehrhardt, 2008). It is one of the market values measures that can be used to evaluate the enterprise. Financial analysts point out that a stock with a high stock price to earnings per share ratio is a growth stock (Corrado, Jordan, 2005). They also believe that these companies frequently do not divide all of their profits in order to reinvest them in better investment opportunities. When it comes to enterprises with increasing expected returns, the above-mentioned percentage must also rise.

The Gordon Growth Model equation can be used to determine stock prices and measure their intrinsic value based on the relationship between profitability multiplier and sustainable growth rate. Gordon and Shapiro (1956) and Gordon (1962) developed the Gordon growth model, which assumes that dividends grow at a constant rate indefinitely.

$$P0 = \frac{D0(1 + g)}{r - g} \qquad (3)$$

$$\text{Or } P0 = \frac{D1}{r - g} \qquad (4)$$

Where:

Dividend growth (g) = sustainable growth rate according to Gordon's equation (Stowe et.al., 2007)

The equation can be formulated by dividing both sides of the equation by the earnings per share:

$$P0 / E1 = \frac{D1/E1}{r - g} \qquad (5)$$

$$P / E = \frac{\text{Dividend payout ratio}}{\text{the required rate of return on investment} - \text{sustainable growth rate}} \qquad (6)$$

Gordon (1962) and (Fun and Basana, 2012) show that firm PE ratios are positively correlated with firm growth rate based on the above equation. After reviewing previous research, I discovered a few studies that investigated the relationship between the sustainable growth rate and the profitability multiplier specially by applying Higgins model and PRAT model. I discovered some studies that investigated the relationship between the profitability multiplier and other variables in order to determine the determinants of the profitability multiplier that affect the investor's investment decision.

The purpose of (Liu et al., 2002) study was to test the relationship between several multiples and the market share price. The research was carried out on a sample of American businesses. The study concluded that the profitability multiplier is the best explanation for market share price, and the historical profit multiplier is the second-best explanation for market share price. The sales multiplier was the worst estimate of the stock's market price, followed by the cash flow multiplier and the book value multiplier.

The Ramcharran (2002) study examined the impact of economic growth and credit risks on the price-to-return ratio in a variety of emerging markets. The findings revealed the existence of an effect of

economic growth and an effect of credit risk on the price-to-earnings ratio. Also, study of (Olson & Pagano, 2005) aimed to investigate and analyze the impact of sustainable growth on the performance of American banks and their extraordinary returns by applying to banks that merged between 1987 and 2000. The study concluded that for the banks that merged during that time period, sustainable growth was the most important determinant of performance, as measured by the change in the difference between stock return and market return. The findings also concluded that dividends were a factor in bank performance during that time period. Pandey (2005) investigated the factors that influence market value, as measured by market value to book value. The researcher concluded that the sustainable growth rate has a negative impact on market value. The researcher justified this finding by stating that the relationship between sustainable growth and value is primarily determined by how large or small the value of the return on equity (ROE) is in comparison to the cost (K). If the ROE is less than K, the sustainable growth, which is calculated using profit reinvestment, will have a negative impact on the value.

Amouzesh et al. (2011) attempted to investigate the relationship between sustainable growth rate and the performance of Iranian firms. They investigated the relationship between the deviation of actual growth rate from sustainable growth rate, return on equity (ROA), price to book value ratio (P/B), and current and acid ratios using the linear regression equation. They discover that the difference between the actual and sustainable growth rates is related to the ROA and P/B ratios. Afza and Tahir (2012) uses Ordinary Least Square (OLS) regression on pooled data from 25 firms listed on the Karachi Stock Exchange to identify the factors explaining variations in P/E ratio for Pakistan's chemical sector. The results show that the dividend payout ratio and Tobin's Q continue to be the most important determinants of P/E ratios for both pooled and time-series analysis.

In an attempt to test the determinants of price earning ratio (Premkanth, 2013), test the determinants of price earning ratio in Sri Lankan firms. He discovered that the ROE has a negative impact on the P/E and the dividend payout has a positive impact on the P/E among Sri Lankan listed companies. Wu (2014) investigated the relationship between return on equity and profitability multiplier. He discovers a U-shaped relationship between forward P/E and return on equity (ROE). The study (Madoroba and Kruger, 2015) aims to investigate the behavior of the Johannesburg Stock Exchange's sustainable growth rate and the stock prices of 64 listed companies. In conclusion, the findings of this study emphasize that the Gordon Growth Model for equity valuation must account for firms' complex growth parameters in order to avoid mispricing shares. The purpose of the (Aisyah and Rodoni,2016) study was to examine the impact of the net profit margin, current ratio, and dividend payout ratio on the price earning ratio and price book value. The study's findings concluded that the dividend payout ratio has an effect on the price earning ratio.

Hartono and Utami (2016) studied the relationship between the sustainable growth rate and the profitability multiplier on a sample of Indonesian companies. Both variables were discovered to have an inverse relationship. Ochuko, 2017) investigated the effect of price-earnings ratio determinants on Nigerian firms using the fixed effect model and the random effect model. The dividend payout ratio, share price, dividend per share, profitability, market return, and company size were all found to have an effect on the price-earnings ratio. In the study of (TAHIR et al,2017), they attempted to identify the factors explaining variations in the Price-to-Earnings ratio for the banking sector of Pakistan by using Ordinary Least Square regression model on balanced data of all the banking firms listed at Karachi Stock Exchange. According to the findings, the Dividend Payout Ratio remains the most important determinant of the Price-to-Earnings Ratio for both balanced and time-series data analysis. Altahtamouni (2018) sought to identify market value determinants for Jordanian banks, as measured by market to book value. He discovered that profitability, investment decisions, and long-term growth all have an impact on market value.

The study of Fesokh and Haddad (2019) seeks to investigate the factors that explain the behavior of the Price/Earnings ratio, with the primary goal of establishing a relationship between the Price/Earnings ratio and the factors that influence it. The findings (OLS regression) revealed that Tobin's Q, dividend growth, leverage, and size had the greatest impact on the Price/Earnings ratio. According to the findings of (Freihat, 2019) study, the most important factors influencing the price-earning ratio in the Amman Stock Exchange are dividend payout ratio and size. Aribawa et al. (2020) conducted research to determine the determinant of price earning ratio (PER) in property and real estate companies listed on the Indonesian Stock Exchange. The outcomes of each variable can be explained as follows: Tobin's Q has a positive impact, whereas Earning Growth and Size have a negative impact.

Do and Pham (2020) investigated the relationship between profitability multiplier and sustainable growth rate in Vietnamese firms. They concluded that the rate of sustainable growth and its components have an impact on the price-earnings ratio. Itemgenova and Sikveland (2020) investigated the factors that explain market value. According to the findings, return on equity is an important determinant of the price-earnings ratio and is negatively related to it. Listian and Supramono (2020) investigated the extent to which the sustainable growth rate could transfer the relationship between fixed asset growth and market value of a sample of Indonesian firms. The findings show that a firm's value is positively impacted by its sustainable growth rate. Iskenderolu and Karadeniz (2022) investigated the company-specific variables that influence price-to-earnings ratios for Turkish tourism companies listed on the Istanbul Stock Exchange. The analysis found a positive relationship between the Tobin Q ratio and the price-earnings ratio, but a negative relationship between the financial leverage ratio, stock price volatility, and the price-earnings ratio. In addition, there is no statistically significant relationship between sales volume and the price-earnings ratio.

2. METHODOLOGY

2.1 Sample and Data

The study population includes the Saudi banking sector from 2010 to 2019. In terms of the study sample, all banks in the Saudi banking sector were chosen if data were available throughout the study period.

2.2 Study Hypotheses

As previously stated, the assumed relationship between the sustainable growth rate and the profitability multiplier is a positive one. Thus, the following study hypotheses can be developed to test the relationship between SGR (as the basic model and the PRAT model) and market value:

H01: There is no statistically significant effect of sustainable growth rate on the market value.
H02: There is no statistically significant effect of Higgins basic model (return on equity and retention rate) on the market value.
H03: There is no statistically significant effect of PRAT model (profit margin, assets turn over, financial leverage and retention rate) on market value.

2.3 Variables measurement

Table 1 explains the study variables in accordance with previous studies as well as the theoretical framework and hypotheses of this study.

Table 1. Variable definitions and measurements

Variable	Descriptions	Measurements
Dependent Variable		
Market value measured by (PE)	Price Earnings ratio	Ending share price/Earnings per share
Independent Variables		
SGR	Sustainable Growth Rate	Return on Equity× Retention Rate
ROE	Return on Equity	Net income / Equity
P	Profit Margin	Net Income / Sales
R	Retention Rate	(1 – Dividend payout ratio)
A	Assets Turnover	Sales / Total assets
T	Financial leverage	Total asset / Equity

Source: own

2.4 The study models

In this study, the following models were used to express the relationship between independent variables and dependent variables. The First Model:

$$PE_{it} = \alpha + \beta_1 SGR \qquad\qquad (7)$$

The Second Model (Higgins basic model):

$$PE_{it} = \alpha + \beta_1 ROE + \beta_2 R + ei \qquad\qquad (8)$$

The Third Model (PRAT model):

$$PE_{it} = \alpha + \beta_1 P + \beta_2 R + \beta_3 A + \beta_4 T + ei \qquad (9)$$

2.5 Statistical Methods

In addition to testing the association between study variables, the main test that will be used in this study is multiple linear regression using stepwise regression in order to reach the best model to predict the market value throughout the mechanism of excluding non-influential factors in the market value. Researchers frequently use stepwise regression to select the "best" set of explanatory variables for a regression model (Gujarati and Porter 2009). Stepwise regression can be done in two ways: forward stepwise and backward stepwise. A forward-selection rule begins with no explanatory variables and then adds variables one at a time, based on which variable is the most statistically significant, until no statistically significant variables remain. A backward-elimination rule begins with all possible explanatory variables and then, one by one, discards the least statistically significant variables.

When each variable remaining in the equation is statistically significant, the discarding process comes to an end. Backward elimination is difficult when there are a large number of candidate variables, and it is impossible when the number of candidate variables exceeds the number of observations (Smith, 2018). The second and third models, as shown in the study models, will be subjected to stepwise regression.

3. EMPIRICAL RESULTS

3.1 Results of the descriptive statistics

Table 2 shows the descriptive statistics for the study variables, including the maximum and minimum values for the variables, as well as the mean and standard deviation. The table shows that the mean for market value is (19.2323) and the standard deviation is (75.06498), indicating that some banks' market values moved away from the sector's average during the study period. The findings show that some banks worked to create wealth for their owners, with the maximum value for the market value equaling (788.00). The results show that the maximum value for Saudi banks' sustainable growth is 0.22, the minimum value is zero, and the average value is 0.0760. Furthermore, the maximum values for profit margin, retention rate, assets turnover, and financial leverage are 0.68, 1.06, and 10.81, respectively.

Table 2. Descriptive *Statistics*

Variables	Minimum	Maximum	Mean	St. Deviation
PE	3.55	788.00	19.2323	75.06498
SGR	.00	.22	.0760	.04158
ROE	.00	.22	.1194	.04547
P	.02	.68	.4642	.14644
R	.00	1.00	.6340	.25441
A	.02	.06	.0377	.00705
T	1.71	10.81	6.8433	1.42086

Source: Author's calculations

3.2 Results of correlation analysis

The results of testing the correlation between the study variables based on the Pearson correlation coefficient for each model are shown in Tables 3, 4, and 5. The correlation analysis results show that there is a statistically significant correlation between each of SGR, ROE, P, R, A, T, and market value. Correlation coefficients ranged between 0.957 and 0.283. These findings show that the strongest relationship is between ROE and market value, and there is no relationship between retention rate (R) and market value.

Table 3. Correlation analysis of the first model

Variables	PE	SGR
PE	1	.461*
SGR	.461*	1

Note: * Statically significant at 1%.

Table 4. Correlation analysis of the second model (Higgins basic model)

Variables	PE	ROE	RR
PE	1	.957*	.005
ROE	.957*	1	.016
R	.005	.016	1

Note: * Statically significant at 1%.

Table 5. Correlation analysis of the third model (PRAT model)

Variables	PE	P	R	A	T
PE	1	.824*	.005	.443*	.283*
P	.824*	1	.025	.394*	.228**
R	.005	.025	1	.068	.181
A	.443*	.394*	.068	1	.078
T	.283*	.228**	.181	.078	1

Note: * Statically significant at 1%. ** Statically significant at 5%.

3.3. Results of Regression Analysis

When the study's hypotheses were tested using multiple linear regression, the following results were obtained, as shown in Tables 6, 7, and 8. Table 6 shows that the sustainable growth rate has a positive significant effect on market value, with an explanatory power (R-squared) of 21.3 percent, implying that the sustainable growth rate explains 21.3 percent of the changes in market value. As a result, the first hypothesis, that there is no statistically significant effect of sustainable growth rate on market value, can be rejected.

Table 7 also shows that the ROE has a positive significant effect on market value, with an explanatory power of 91.6 percent, and that the retention rate (R) has no effect on market value. As a result, the second hypothesis, indicating that the Higgins basic model (return on equity and retention rate) has no statistically significant effect on market value, can be rejected. This result is consistent with the (Wu,2014) study on the effect of ROE on market value.

Table 8 shows that profit margin (P), assets turnover (A), and financial leverage (T) all have a significant effect on market value, but retention rate (R) has no effect. As a result, the third hypothesis, which indicates that the PRAT model (profit margin, assets turnover, financial leverage, and retention rate) has no statistically significant effect on market value, can be rejected.

Tables 7 and 8 also show the variance inflationary factor (VIF), which is a measure of the linear Collinearity among variables, Collinearity Statistics, with coefficient values ranging from 1.039 to 1.244 in table 7 and 1.039 to 1.244 in table 8. According to Krehbiel et al. (2004), if the coefficient of VIF is equal to or greater than ten, there is a problem with strong collinearity among independent variables. However, if the VIF coefficient is equal to (1 - 5), this indicates that there is no collinearity between independent variables.

Table 6. Multiple linear regression of the first model

Variables	B	T	Sig.	R-squared	F-value
Constant	11.199	1.694	.093		
SGR	5.975	5.375	.000	0.213	28.895*

Note: * Statically significant at 1%.

Table 7. Multiple linear regression of the second model (Higgins basic model)

Variables	B	T	Sig.	Collinearity Statistics VIF	R-squared	F-value
Constant	4.249	1.924	.057			
ROE	25.825	33.959	.000	1.000	0.916	576.608*
R	-.325-	-.362-	.718	1.000		

Note: * Statically significant at 1%.

Table 8. Multiple linear regression of the third model (PRAT model)

Variables	B	T	Sig.	Collinearity Statistics VIF	R-squared	F-value
Constant	-2.442-	-.518-	.606			
P	34.848	12.535	.000	1.244		
R	-1.382-	-.803-	.424	1.039	0.706	62.574*
A	100.281	2.492	.014	1.189		
T	76.072	1.979	.050	1.091		

Note: * Statically significant at 1%.

When forward stepwise regression was applied to the eighth model (Higgins basic model) and ninth model (PRAT model), as shown in Tables 9 and 10, it was discovered that the best variables explaining market value in the Higgins basic model are the profit margin and asset turnover, after excluding the retention rate and financial leverage, and that the best variables explaining market value in the PRAT model are the profit margin and asset turnover, after excluding the retention rate and financial leverage.

The best regression models for predicting market value using the Higgins basic model and the PRAT model, respectively, are:

$PE_{it} = 4.086 + 25.820\ ROE$ .... *Higgins basic model*   (10)

$PE_{it} = .763 + 36.058\ P + 97.103\ A$ ...... *PRAT model*   (11)

Table 9. Stepwise multiple linear regression for Higgins basic model

Variables	B	T	Sig.	R-squared	F-value
Constant	4.086	1.898	.060		
ROE	25.820	34.096	.000	0.916	1162.522*
Excluded variables	B	T	Sig.		
R	-.010-	-.362-	.718		

Note: * Statically significant at 1%.

Table 10. Stepwise multiple linear regression for PRAT model

Variables	B	T	Sig.	R-squared	F-value
Constant	.763	.176	.861		
P	36.058	13.164	.000	0.695	120.674*
A	97.103	2.395	.018		
Excluded variables	B	T	Sig.		
R	-.024-	-.444-	.658		
T	.102	1.867	.065		

Note: * Statically significant at 1%.

4. DISCUSSION

The purpose of this study was to investigate the impact of sustainable growth and its determinants on the price earning ratio as a measure of market value. We discovered a strong correlation between ROE and market value based on the findings. This result is consistent with the findings of (Wu,2014) but contradicts the findings of Premkanth (2013) and (Dutta et al., 2018). This result confirms that the market value reflects investors' interest in reading and reflecting the profits made by Saudi banks in the market value. The findings revealed that sustainable growth has an effect on market value. This indicates that the increase in the return obtained from bank sales and reinvested has had a positive significant effect on market value as measured by the profitability multiplier. This result is consistent with the findings of Olson & Pagano (2005), Altahtamouni (2018), Do and Pham (2020), and Listian and Supramono (2020), but contradicts the findings of Pandey (2005), Wu (2014) and Hartono and Utami (2016). Furthermore, this indicates that bank sales are increasing and that the return on investment and sales has resulted in a return greater than the investment cost. This has also reduced the risk of nonpayment for those banks, which is reflected in their deposits and any other debts owed to them. This result confirms what was stated by Corrado and Jordan (2005), who emphasized that growth shares have a high ratio of share price to return on one share. They also stated that the increase in the market value of those banks' shares indicates that investors anticipate high growth rates in the future, as the future growth rate represents the sustainable growth rate. The retention rate and market value have no relationship. This indicates that the retention rate is not regarded as a factor influencing the market value for investors in the Saudi banking sector, implying that the market value is unrelated to the banks' future plans and aspirations. This result is consistent with what was stated in the study of (Miller and Modigliani, 1961), which rejects the existence of a link between stock price and dividend policy and stock price, and it is inconsistent with what was stated in the study of (Premkanth, 2013). The findings revealed that profit margin has a positive effect on market value, with the greater the net profit margin, the better the company's ability to control costs, and the higher the net profit margin,

the better it can maximize net profit from sales, which is reflected on market value, a finding that contradicts previous findings Aisyah and Rodoni (2016). It was also discovered that the asset turnover rate has a positive impact on market value, which explains the company's efficiency in using its assets to generate sales, which is positively reflected in the market value. In terms of financial leverage, it has a positive impact on market value, which is consistent with theory (Miller and Modigliani, 1961). According to the Gordan model, the components of the Higgins basic model for measuring sustainable growth affect market value, and the components of the PRAT model affect market value, and the best influencing elements using the stepwise regression are the return on equity, profit margin, and asset turnover with a high explanatory power, which reinforces that sustainable growth and its components, according to the Gordan model, affect market value.

CONCLUSION

This study tested the impact of sustainable growth and its components on market value using the basic Higgins model and the PRAT model on Saudi banks. According to the researcher's knowledge, this study is the first of its kind to investigate the factors influencing market value as measured by the price earning ratio using the sustainable growth rate and its components through application in the Saudi environment, particularly on Saudi banks, which are extremely important in the Saudi financial market. Data for the study were gathered between 2010 and 2019. The study discovered an effect on the market value measured by the price earning ratio on the return on equity, profit margin, asset turnover, and financial leverage by using the multiple linear regression test with stepwise regression to find the best model for predicting the market value and applying forward stepwise regression. It was discovered that the best variables explaining market value in the Higgins basic model after excluding the retention rate is ROE, and that the best variables explaining market value in the PRAT model after excluding the retention rate and financial leverage are the profit margin and asset turnover. Future research should include other financial and non-financial companies to investigate the effect of the Higgins model components on various market value measures.

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Energy Supply Security in Baltic States

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ARTICLE INFO

ABSTRACT

The aim of this paper is to analyse energy supply security concept and indicators used to measure energy security based on the main issues such as energy import dependency, energy supplier concentration/diversification and available energy infrastructure. The framework of energy security indicators was developed based on literature review. The framework was applied to evaluate Baltic States based on energy security indicators. The advanced MCDM tool was applied to rank Baltic States based on energy security indicators as countries have very different performance in terms of specific aspects of energy security making their ranking impossible. MCDM applied allowed to define that the best performing country in terms of energy security was Estonia mainly due to very low level of total energy import dependency. The policies and measures to promote security of energy supply were developed based on results and findings of research conducted.

INTRODUCTION

Energy security is one of the most important sustainable energy development targets in economic pillar of energy sustainability. If energy poverty reduction is the main objective in social pillar, and GHG emission reduction is the main goal in environmental pilar, energy security is the main focus of economic pillar of sustainable energy development (World Energy Council, 2020; Istudor et al., 2021). All three energy sustainability pillars are equally important and sustainable energy development aims to implement they all together (Connolly et al., 2016). International Energy Agency (IEA, 2007) is defining energy security as 'reliable, affordable access to all energy sources. EU Member states are unfavourably dependent on energy imports and have problems with reliability of energy supply. Energy import makes almost 60 % of the EU's energy supply and was constantly increasing. Such high reliance of EU on energy imports makes EU states vulnerable. The biggest problems in 2021 with security of energy supply in EU were connected to reliability of the natural gas supplier – Gazprom. Russia's invasion of Ukraine in February 2022 made additional threats of energy supplies from Russia to EU.

In May 2022 European Commission introduced the REPowerEU Plan, to achieve a global, clean and just energy transition to ensure sustainable, secure and affordable energy in EU Member States. The plan seeks to diminish the overall energy consumption by improvements of energy efficiency and further penetration of renewable energy. The plan supports Ukraine and aims to prepare for further EU energy market integration repairing energy infrastructure paving the pathway for a low carbon energy transition and green energy future for Europe (Streimikiene, 2022).

Though there are many studies (Vicini et al., 2005; Yergin, 2006; APERC, 2007; Elkind, 2009; Huges, 2012; Axon et al., 2013; Elbassoussy, 2019; Bolino & Galkin, 2021; Yu et al., 2022; Krikstolaitis et al., 2022) dealing with security of energy supply and there are various definitions of energy security including various energy security indicators (Cabalu, 2010; Cohen, Loungani, 2011; Song et al., 2019) it is important to develop a simple and transparent energy security indicators framework covering main aspects of energy security ranging from energy import dependency and energy supply concentration to energy infrastructure development. Such indicators framework should include indicators available in Eurostat database in order to make comparison among EU member states and to assess the positive or negative trends of energy security development in EU countries. Such indicators system is very useful for identifying the strengths and weakness of countries in terms of various aspects of energy security and allows to learn from best practices and to develop policies and measures targeting the weakest items in energy security of selected countries. The rest of the paper is structured in the following way: section 1 presents literature review, section 2 introduces methods and data; section 3 provides discussion of the main energy security metrics and section and section 4 concludes.

1. LITERATURE REVIEW

The IEA defines energy security as the uninterrupted availability of energy sources at an affordable price. Energy security is multi-faceted issue. The long-term energy security covers necessary investments to ensure reliable energy isupply for economic development (IEA, 2007). Study by Vicini et al. (2005), analysed the main elements of energy security risk ranging from physical disruption, economic, social and environmental one. Physical disruption of energy supply can happen because of interruptions in energy production. Economic disruption of energy supply is linked to prices fluctuations in international energy markets. Social disruption is related to instability of energy supplies to households. Environmental disruption can occur because of the environmental damage caused by energy systems like nuclear accidents, or GHG emissions which need to be controlled. The shortterm and long-term ernergy security are distinguished.

Yergin (2006) defined energy security as ensuring adequate energy suppliers at affordable and reasonable prices. According to Yergin (2006) energy exporting countriesare mainly putting emphasis on, security of demand" of their energy export, however energy importing countries put main focus on security of supply. Developing countries are mostly concerned with energy price fluctuations on internal energy markets having negative impact on their balance of payments

Asia-Pacific Energy Research Center (APERC, 2007) has defined energy security based on the man issues linked to energy security described in the following way: availability of adequate energy carriers reserves and capacity of economy to supply energy to meet the energy demand; the energy resources and energy supplier diversification; availability of energy infrastructure transportation infrastructure; the geopolitical situation linked to resources acquisition. Elkind (2010) introduced new dimensions of energy security, i.e. environmental sustainability to the already existing three dimensions which are availability, reliability, and affordability. He also highlighted the importance of negative impacts of energy supply due to climate change.

Other scholars were also analysing energy security based on two issues availability and affordability in terms of prices (Cabalu, 2010; Axon et al., 2013). Other scholars were putting more emphasis on diversification of energy supplier linked to energy sources and suppliers (Cohen, Loungani, 2011; Bolino & Galkin, 2021; De Rosa et al., 2022). Sovacool (2011) defined energy security as Equitable providing of available, affordable, reliable, efficient, environmentally benign, proactively governed, and socially acceptable energy services to end users. Huges (2012) analysed the role of government in ensuring security of energy supply. Huges (2012) defined energy security as governmental policies and actions to ensure access to safe, reliable and affordable energy supply to communities. Based on analysis of energy security definitions the most comprehensive definition is that energy security is availability of adequate production and supply of energy sources at affordable

prices. The availability is the main issue and energy security indicators are mainly dealing with energy affordability issues (Krikstolaitis et al., 2022; Streimikiene, 2020).

2. DATA AND METHODOLOGY

The main approach applied in this paper analysis of energy security indicators and their dynamics in Baltic States and use of MCDM tools for ranking of Baltic States based on their achievements in energy security. The quantitative indicators of energy security were selected from Eurostat based on data availability. The selected indicators cover three main areas: energy import dependency, supplier concertation and available energy infrastructure in natural gas and power sector. Therefore, the data was used for analysis of the main energy security indicators in Baltic States. Table 1 presents the framework of indicators applied for energy supply security assessment.

Table 1. Main energy security indicators and desirable trends

Indicator	Description	Abbreviation	Desirable trend	Source
Energy import dependency indicators				
1. Net energy import dependency	Net Import dependency (NET) (total and by main energy carriers) indicates the percentage of energy that country is importing or the extent to which an economy relies on energy imports due to meeting its energy needs, %	ID 1	↓	Eurostat database (http://ec.europa.eu/eurostat/data/database).
Supplier concentration indicators				
2. Total Supplier concentration index:	Supplier concentration index (SCI) (total is calculated based on HHI and shows the degree of concentration of main energy sources imports from energy suppliers situated outside of the European Economic Area, index , 0-100 (100 means maximum concentration)	SC 1	↓	Eurostat database: http://ec.europa.eu/eurostat/data/database
Energy infrastructure indicators				
3. N-1 rule for gas infrastructure	N-1 rule for gas infrastructure indicator shows the capability of available natural gas infrastructure to cover overall natural gas demand in case of a interruption of the single largest natural gas infrastructure during days of extremely high demand like enormously cold days, % of total demand that can be satisfied if the largest item of gas supply infrastructure is disrupted	EI 1	↑	Member States' Risk Assessments and Preventive Action Plans:.https://ec.europa.eu/energy/topics/energy-security/secure-gas-supplies_en
4. Electricity interconnection capacity	Electricity interconnectivity level is the ratio between interconnection capacity of power import specific country and its overall power genera-	EI 2	↑	ENTSO-E winter outlook reports: https://www.entsoe.eu/out-

Source: created by authors based on (European Commission, 2022)

As one can see from energy supply security indicators framework given in Table 1, the main energy security indicators selected are covering energy import dependency and energy import diversification or energy supply concentration of the main energy carriers imports from suppliers outside of EEA. These concentration indicators are calculated as HHI and are scaled in the range of 0-100 where 100 indicates that the given country imports all its energy carriers from an unique supplier, and 0 indicates that the country is fully independent of energy imports.

There are two additional indicators of security of energy supply linked to energy infrastructure: N-1 indicator and electricity interconnectivity indicator. N-1 criteria for gas infrastructure is an indicator of natural gas supply infrastructure adequacy by testing the resilience of the natural gas supply system. The indicator is defined in the Annex II of the Regulation (EU) 2017/1938 concerning measures to safeguard security of gas supply and is available for all EU Member States. Electricity interconnectivity level indicators shows the share of electricity import interconnection capacity of a given Member State and its total power generation capacity. It is calculated as the ratio of the synchronous import interconnection capacity and the total generation capacity at 19:00 around the date of 10th January each year.

Therefore, energy security framework of indicators covers three groups of indicators addressing energy supply security: energy import dependency, energy import concentration/diversification and energy infrastructure indicators. The countries will be ranked based on energy security indicators by applying MCDM tool MEREC-TOPSIS in order to find the best performing country in terms of energy security. MCDM method based on the Removal Effects of Criteria (MEREC) is used to calculate the objective weights and applied the Technique for Order of Preference by Similarity to the Ideal Solution (TOPSIS) to rank countries according to weighted criteria. The steps of the proposed method are presented in the following.

Step 1. Decision matrix

Let $\{b_1, b_2, \ldots, b_m\}$ a set of Baltic countries, and $\{cr_1, cr_2, \ldots, cr_n\}$ a set of criteria; thus, $\mathbb{Z} = (x_{ij})_{m \times n}$, where $x_{ij} \, \forall \, i = 1, \ldots, m; j = 1, \ldots, n$, is the given score to i_{th} Baltic country, according to j_{th} criteria (Keshavarz-Ghorabaee et al., 2021).

Step 2. Normalized matrix

Equation one normalizes the decision matrix, where $\tilde{\Xi} = (\dot{x}_{ij})_{m \times n}$ is a normalized matrix.

$$\dot{x}_{ij} = \begin{cases} \dfrac{\min_x x_j}{x_{ij}}, & j \in N_b \\ \dfrac{x_{ij}}{\max_x k_j}, & j \in N_n \end{cases} \qquad 1$$

Step 3. Overall performance of countries

Equation two calculates the overall performance $\wp_i$.

$$\wp_i = \ln\left(1 + \left(\frac{1}{m}\sum_j \left|\ln(\dot{x}_{ij})\right|\right)\right) \qquad 2$$

Step 4. Overall performance of alternatives by removing each criterion

$\wp_{ij}$ the overall performance of i_{th} alternative concerning the removal of j_{th} criterion. Equation three calculates $\wp_{ij}$:

$$\wp_{ij} = \ln\left(1 + \left(\frac{1}{m}\sum_{k, k \neq j} \left|\ln(\dot{x}_{ij})\right|\right)\right) \qquad 3$$

Step 5. Absolute deviations

$\mathcal{E}_j$ shows the consequence of eliminating the jth condition. Equation four determines the values of $\mathcal{E}_j$:

$$\mathcal{E}_j = \sum_i |\wp_{ij} - \wp_i| \qquad 4$$

Step 6. Final weights

Equation five calculates W_j:

$$W_j = \frac{\mathcal{E}_j}{\sum_k \mathcal{E}_k} \qquad 5$$

Step 7. Weighted matrix

Equation six calculates the weighted matrix, subject to $\sum_{i=1}^n W_i = 1$.

$$\hat{x}_{ij} = \tilde{x}_{ij} * w_i \quad (i = 1, \dots, m; j = 1, \dots, n) \qquad 6$$

Where $\tilde{x}_{ij} = \dfrac{x_{ij}}{\sqrt{\sum_{i=1}^m x_{ij}^2}}$ for (j = 1, ..., n).

Step 8. PIS and NIS

Equations seven and eight calculate the positive and negative ideal solutions (Kamali Saraji, et al., 2022).

$$A^+ = \left\{ \left(\max_i \hat{x}_{ij} \,|\, j \in J \right), \left(\min_i \hat{x}_{ij} \,|\, j \in \hat{J} \right) \,|\, i = 1, \dots, m \right\} \qquad 7$$
$$= \{x_1^+, x_2^+, \dots, x_n^+\}$$
$$A^- = \left\{ \left(\min_i \hat{x}_{ij} \,|\, j \in J \right), \left(\max_i \hat{x}_{ij} \,|\, j \in \hat{J} \right) \,|\, i = 1, \dots, m \right\} = \qquad 8$$
$$= \{x_1^-, x_2^-, \dots, x_n^-\}$$

Where $J = \{j = 1,2, \dots, n | j \text{ associated with the benefit criteria}\}$, and $\hat{J} = \{j = 1,2, \dots, n | j \text{ associated with the cost criteria}\}$.

Step 9. Separation measure

Equations nine and ten calculate the positive and negative ideal separations.

$$S_i^+ = \sqrt{\sum_{j=1}^n (\hat{x}_{ij} - x_j^+)^2} \quad (i = 1, \dots, m) \qquad 9$$

$$S_i^- = \sqrt{\sum_{j=1}^n (\hat{x}_{ij} - x_j^-)^2} \quad (i = 1, \dots, m) \qquad 10$$

Step 9. Relative closeness

Equation eleven calculates relative closeness.

$$C_i^* = \frac{S_i^-}{S_i^- + S_i^+}, \qquad 0 < C_i^* < 1, i = 1, \dots, m \qquad 11$$

Where $C_i^* = 1 \text{ if } A_i = A^+$, and $C_i^* = 0 \text{ if } A_i = A^-$. Alternatives are ranked according to the descending order of C_i^*.

The results of assessment of energy supply security in Baltic States based on developed framework of indicators and MCDM tool by using available data in EUROSTAT are discussed in section 3.

3. DISSCUSSION OF RESULTS

The main energy security indicators of Baltic States are shown in Table 2 for 2014-2020 period based on available data.

**Table 2.** Development of energy supply security indicators in Baltic States during 2012-2020 period

Country	2014	2015	2016	2017	2018	2019	2020
ID 1							
Estonia	11.56	11.18	8.07	4.58	1.23	4.84	10.5
Latvia	40.59	51.18	47.15	44.05	44.31	43.91	45.48
Lithuania	74.94	75.45	74.78	71.97	73.9	75.2	74.91
SC 1							
Estonia	50.55	53.1	48.47	65.8	76.05	NA	NA
Latvia	23.23	41.92	30.16	39.68	42.32	NA	NA
Lithuania	87.63	71.61	51.58	45.62	47.75	NA	NA
EI 1							
Estonia	NA	NA	NA	NA	105	105	NA
Latvia	NA	NA	NA	NA	248.59	248.59	NA
Lithuania	NA	NA	NA	NA	153.4	153.4	NA
EI 2							
Estonia	NA	NA	NA	NA	NA	67.62	67.62
Latvia	NA	NA	NA	NA	NA	53.86	42.13
Lithuania	NA	NA	NA	NA	NA	86.49	77

Source: Created by authors based on European Commision (2022)

As one can notice from information presented in Table 2 very limited data is available for electricity infrastructure indicator (EI 2) showing the electricity interconnectivity level as the ratio between interconnection capacity of power import and the overall power generation capacity. The data provided for 2019 and 2020 reveals that Lithuania distinguishes with the highest electricity interconnectivity level among Baltic States. Latvia has lowest electricity interconnectivity level due to high share of hydro in electricity generation. This indicator has declined inn 2020 for Latvia and Lithuania though it remained stable in Latvia.

Also, there is limited data available for gas infrastructure indicator (EI 1) or N-1 rule gas infrastructure indicator showing the capability of available natural gas infra-structure to cover overall natural gas demand in case of disruption. As one can notice from Table 2 this indicator remain stable for all Baltic States in 2018 -2019 and Latvia distinguishes among other Baltic States with high N-1 rule gas infrastructure indicator as country has Incukalnis underground gas storage with capacity of 4.47 billion cubic meters, from which 2.32 billion cubic meters is active or constantly pumped natural gas.

As more data is available for assessing security of energy supply for Baltic States based on net energy import dependency in Figure 1 the development of net energy import dependency of Baltic States during 2014-2020 period is given.
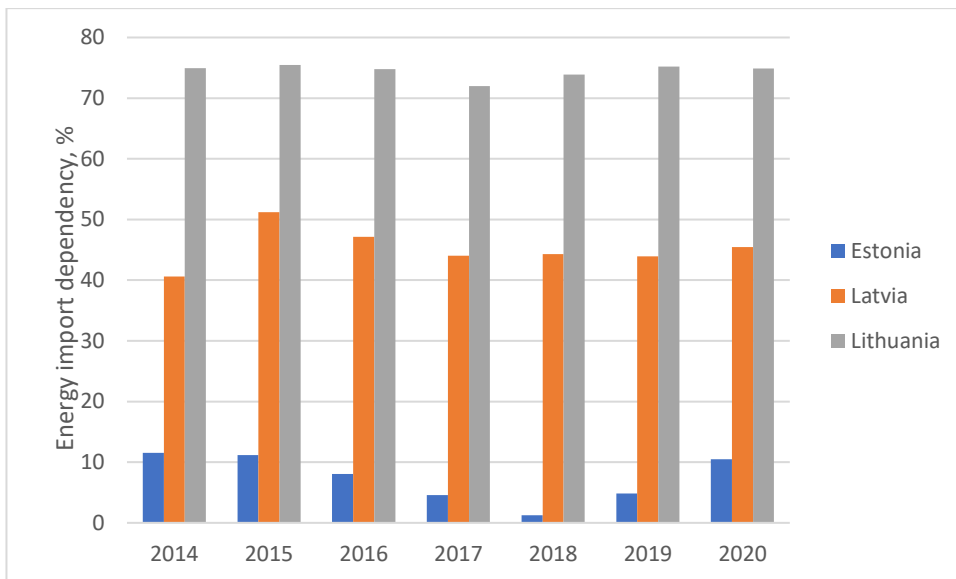
Figure 1. Net energy import dependency (ID 1 indicator) development in Baltic States during 2014-2020 period

Source: Created by authors based on European Commission (2022)

The data presented in Figure 1 shows that Lithuania distinguishes with very high energy import dependency among Baltic States. This is due to the fact that Lithuania does not have own energy resources like Estonia having high share of local oil shale in primary energy supply or Latvia having high hydro energy resources and thus, having a high share of hydro (more than 40%) in electricity generation.

In Figure 2 the development of supplier concentration index (SC 1) of Baltic States during 2014-2018 data is given.
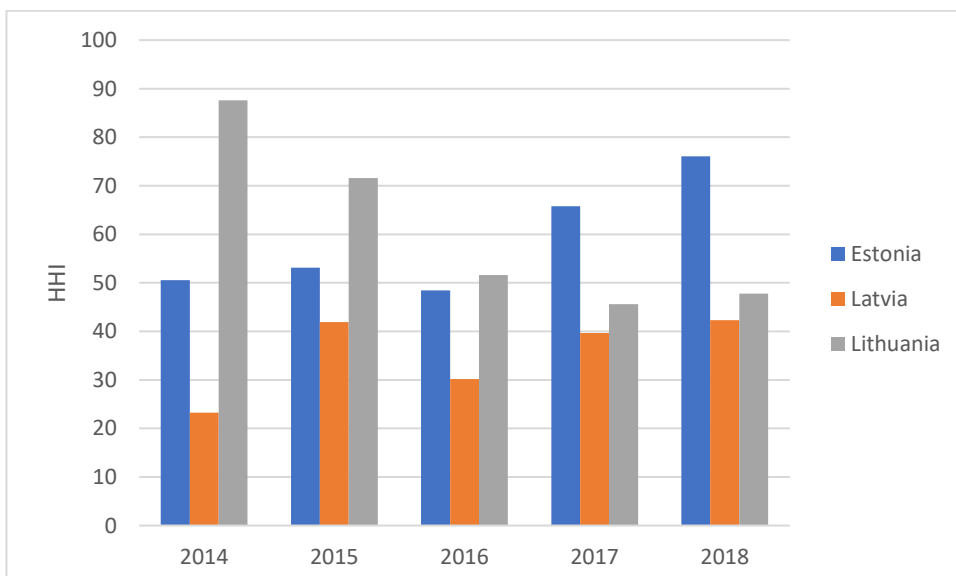
Figure 2. Total supplier concentration index (SC 1 indicator) development for Baltic States during 2014-2018 period

Source: Created by authors based on European Commission (2022)

One can notice from data presented in Figure 2, supplier concentration index has dropped from almost 90 in 2014 to 48 in 2018 for Lithuania showing the increased diversification of energy import from from

energy suppliers situated outside of the European Economic Area. However, the SC1 indicator has increased from 50 in 2014 to 76 in 2018 for Estonia. In Latvia supplier concentration index was fluctuating during investigated period however in 2018 it reached 50 though in 2014 it was 23 in Latvia showing negative trend.

Therefore, Baltic States have very different positions in terms of energy security indicators covering different areas, i.e. Lithuania is in the worst position according net energy import dependency but in the best position in terms of electricity interconnectedness. Latvia is in the worst position in terms of electricity interconnectedness but in the best position in terms of N-1 rule for gas infrastructure indicator. At the same time Estonia is in the worst position in terms of supplier concentration index but in the best position in terms of net energy import dependency.

Further the MCDM tool - MEREC-TOPSIS was applied to rank Baltic States based on energy security indicators as it is not possible to define the best performing country and to rank Baltic States based on energy security indicators therefore, it is necessary trade-off between these indicators. The decision matrix for MEREC-TOPSIS is shown in Table 3.

Table 3. Decision matrix based on energy supply security indicators in Baltic States for 2018

	Estonia	*Latvia*	*Lithuania*	*Desirable trend*
Net energy import dependency, %	1.23	44.31	73.90	↓
Supplier concentration index, 1-100	76.05	42.32	47.75	↓
N-1 rule gas infrastructure indicator, %	105.00	248.59	153.40	↑
Electricity interconnection, %	67.62	53.86	86.49	↑

Source: European Commission (2022)

Afterward, the MEREC is applied to calculate the objective weights. Table 4 shows the results of the MEREC.

Table 4. MEREC results

MEREC	$\wp_i$	$\wp_{ij}$			
		Net energy import dependency, %	*Supplier concentration index, 1-100*	*N-1 rule gas infrastructure indicator, %*	*Electricity interconnection, %*
Estonia	0.734	0.058	0.734	0.734	0.705
Latvia	0.399	0.309	0.295	0.242	0.399
Lithuania	0.287	0.287	0.195	0.213	0.192
Absolute deviations	ε_j	0.766	0.195	0.230	0.124
Final weights	W_j	0.583	0.148	0.175	0.094
Criteria rank		1	3	2	4

Source: Created by authors

The most crucial criterion is "net energy import dependency." Subsequently, the TOPSIS is applied to rank countries according to weighted criteria. Table 5 shows the obtained results of the TOPSIS.

Table 5. TOPSIS results

TOPSIS	Net energy import dependency, %	Supplier concentration index, 1-100	N-1 rule gas infrastructure indicator, %	Electricity interconnection, %
A^+	0.008	0.063	0.140	0.067
A^-	0.500	0.114	0.059	0.041
	S_i^+	S_i^-	C_i^*	Country rank
Estonia	0.096	0.491	0.836	1
Latvia	0.292	0.222	0.431	2
Lithuania	0.494	0.056	0.102	3

Source: Created by authors

The results given in Table 5 shows that Estonia is the highest ranked country in terms of energy security among Baltic States. Lithuania was defined as the worst performing country in terms of energy security due to the same reason.

CONCLUSIONS

Energy supply security is the major policy concern for EU member states due to high energy import dependency from single supplier-Russia. The Russian-Ukrainian war showed high energy vulnerability of EU member states due to high dependence on natural gas and oil supply from Russia. Energy security indicators can be applied to analyze energy security situation in EU Member States based on the main energy security issues: energy import dependency, supplier concentration and energy infrastructure development and using relevant energy security indicators provided by Eurostat database

The conducted case study showed that Baltic States have very different positions in terms of energy security. Lithuania is in the worst position according net energy import de-pendency but in the best position in terms of electricity interconnections. Latvia is in the worst position in terms of electricity interconnections but in the best position according to of N-1 rule for gas infrastructure indicator. Estonia is in the worst position according to supplier concentration index but in the best position in terms of net energy import dependency. In order to define the best performing country in terms of overall energy security the MCDM tool-MEREC-TOPSIS was applied to trade-off between various energy security aspects and Estonia was found as the highest ranked country in terms of energy security. As the most crucial criterion was found- "net energy import dependency", Estonia was defined as the best performing country and Lithuania – as the worst performing country in terms of energy security among Baltic States.

The main policy recommendations to increase energy security for Lithuania is to reduce energy import dependency and supplier concentration. For Latvia the main policy recommendations are to increase electricity interconnection capacities. For Estonia the decrease of supplier concentration level is priority in terms of promotion of energy security. Fast penetration of renewable energy sources together with enhanced energy efficiency measures, provides that Baltic States would become less energy import dependent in long-term however in short-term policies and measures to increase energy storage capacities and development of energy infrastructure plays a crucial role.

The study has limitations due to limited energy security data available for Baltic States in Eurostat. The future research is necessary to address issues of energy security development in Baltic States as well as provide in-depth assessments of policies and measures to promote energy security in Baltic States. The in-depth analysis of energy sector 's of Baltic States is also necessary to reveal differences in energy supply and consumption structure which is highly linked with availability of energy resources, deployment of renewable energy and energy infrastructure developments.

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The Nexus between Banking Development and Economic Growth in the Presence of Trade Openness and Inflation: Case of Vietnam

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ARTICLE INFO

ABSTRACT

The purpose of this research is to examine studies on the relationship be-tween banking development and economic growth in conditions of trade openness and inflation in Vietnam by using ARDL regression estimation method on data. time series from the first quarter of 2000 to the fourth quarter of 2019. Research results have found: There is a relationship between banking development and economic growth in terms of trade openness and inflation in Vietnam.; There was an external economic shock affecting the re-lationship between banking development and economic growth in Vietnam in 2008. A threshold value of 32.86% was found and a threshold value of 32.86% was found. of inflation is 9.19%. With a trade openness of less than 32.86%, it shows that banking development does not contribute to economic growth in Vietnam. However, with a trade openness greater than 32.86%, it shows that banking development has a positive impact on economic growth in Vietnam. Meanwhile, with an inflation rate below 9.19%, banking develop-ment has a positive impact on economic growth through domestic credit to the private sector. And vice versa, with an inflation rate above the threshold of 9.19%, we find a positive impact of banking development on economic growth through the interest rate spread.

INTRODUCTION

After the economic opening policy in 1986, the economic growth rate always reached over 5% per year, even in 1989 the growth rate reached 7.36%. In the period 1992-1997, Vietnam's economic growth rate was quite high, the average annual growth rate reached 8.8%, of which two consecutive years 1995 and 1997.In 1996, the economic growth rate was at 9.54% and 9.34%, respectively. However, in 1998 and 1999, the growth rate dropped sharply to 5.76% and 4.77%, then recovered and grew steadily throughout the period 2000-2007. At this stage, the average growth rate is nearly 7% per year. After joining the WTO, the economic growth rate decreased due to the influence of the world financial crisis, so the economic growth rate was only 5.66% and 5.39% in 2008 and 2009. However, after many efforts to overcome the crisis, the economy has recovered, the average annual economic growth rate in the period 2010-2018 is over 6%, of which in 2018 the economic growth rate reached 7.1%, the highest in more than ten years since the beginning of the year. since 2007 and is among the fastest growing economies in the region and the world. Compared with some countries with fast economic growth in the world in the past 32 years, the average GDP growth of Vietnam is only after China at 9.4%, and 5.9 above Korea and Malaysia. %, on Thailand is 5.2%, 2.6% in the US, 1.7% in Japan and 1.8% in Germany.

A developing economy requires a higher rate of savings and capital formation to meet the production and business capital needs of all economic sectors. Therefore, the commercial banking system plays an important role in stimulating the habit people's savings by offering various attractive deposit methods as well as expanding branches everywhere from urban to rural areas in order to exploit idle money sources in localities. The mobilization of savings in the economy is a long way in speeding up the speed of capital formation to supply businesses and individuals with investment needs in production and business through the granting of credit. Furthermore, a developing economy requires efficient resource mobilization for development purposes. The ratio of domestic credit to the private sector provided by banks to GDP has gradually increased over the years, showing that the Vietnamese banking system is increasingly meeting the increasing capital needs of the market economy. If in the first quarter of 2000, the ratio of domestic credit to the private sector provided by banks to GDP was at 27.5%, then by the end of 2010 ie the fourth quarter of 2010 it reached 114.7 percent. and by the end of 2019 reached 137.9%, in the group of countries with the highest rate. In addition, in terms of economic size, when Vietnam was embargoed by the US, the economy grew very low with a size of only 6.3 billion USD, after the lifting of the US embargo in 1995, along with the Vietnam's bilateral and multilateral cooperation with other countries has helped economic growth, the size of the economy has increased gradually. Especially, from 2002 to 2007, the scale of the economy grew strongly when the bilateral trade agreement between Vietnam and the US officially took effect. According to IMF statistics, if in 2016, the size of Vietnam's economy reached about 217 billion USD, by 2018 the size of Vietnam's economy will reach 240 billion USD, an increase of 20 billion USD compared to 2017. helped Vietnam enter the top 50 with the 49th position in the ranking of the world's top 50 economies of scale. And by the end of 2019 the growth reached 7.02%, bringing the economy size in 2019 to more than 262 billion USD, the highest ever.

The role of the financial system in economic growth has attracted the attention of scholars and policymakers. Therefore, the relationship between financial development and economic growth has always been debated by economists around the world because there are always different and even contradictory views on theory and experimentally on this relationship. The debate about the relationship between financial development and economic growth can be said to originate from the work of Schumpeter (1911) in the early 20th century. Schumpeter asserted the important role of the financial system to economic growth. In particular, he emphasized the role of banks as a decisive factor for economic growth due to the important role of the banking system in allocating capital, encouraging innovation, and financing investments that can be made. effective. The financial system is an important part of the overall economy, helping to circulate savings to entities that need capital to carry out investment projects to make the economy more efficient. The two important parts of the financial system are the financial market and the banking system.

The results of previous studies show that the role of financial development in general and the role of banks in particular has had a positive impact on economic growth such as Bonin and Watchel (2003), Johannes et al (2011), Sehrawat (2014). However, there are also many studies showing that economic growth stimulates the development of the financial system such as Awdeh (2012), Zang and Kim (2007), Liang and Teng (2006), Ang (2007), Colombage (2009), Eng and Habibullah (2011) or other scholars also find evidence for a causal relationship between financial development and economic growth as Hassan et al. (2011), Kar and Pentecost (2000). Thus, it can be seen that the results of the relationship between financial development and economic growth have mixed views in many studies.

In addition, Shangquan (2000) said that in the current global economic context, strengthening cooperation and joining trade organizations in the region and the world is an inevitable economic development trend of Vietnam and many countries in the world. Trade openness has an important influence on economic growth because it reflects the degree of international trade openness of a country and points towards the general trend of economic globalization. Expanding trade openness can have a positive or negative impact on the productivity of domestic goods producers through increasing competitive pressures, changing market shares, increasing access to advancement and diffusion of technology. The trend of economic globalization will lead to an increasing economic interdependence among countries in the world due to the increasing scale of cross-border trade and the wide and rapid spread of services and spillovers. speed of technology. Beck (2002) emphasized preferences, technology and size of the economy as resources of comparative advantage and thus determining the flow of trade between countries. Thereby, contributing to economic growth. In addition, increased trade openness could trigger demand for new financial products. Because, opening trade will face risks related to external shocks and competition from abroad. As such, financial intermediaries will evolve to offer a fuller range of products and services to serve the new needs arising from these risks (Svaleryd and Vlachos, 2002). As the financial system develops, it can create a comparative advantage for products industrial products rely heavily on external finance to stimulate economic growth.

On the other hand, international trade is also an important cause of inflation. This has started debates at various levels about the impact of trade openness and inflation to relationship financial development and economic growth. Various economies, both developed and developing, have recognized the potential for significant effects of trade openness and inflation. Many countries are adopting strategies to exploit the attributes positive effects of trade openness and inflation on economic growth. Stable control of inflation for economic growth is at the heart of macroeconomic policies in developing countries. There are many reasons to explain why inflation can affect the relationship between economic growth and finance. Intuitively, when inflation rates are high or very high, the usefulness of monetary assets will be subject to considerable volatility in future prices and interest rates. Up to the time of this study, the author has reviewed many different studies on the relationship of individual variables such as bank development, trade openness, inflation and economic growth. And found that, there are very few studies examining the relationship between banking development and economic growth in terms of trade openness and inflation, especially in countries with developing economies. The capital supply for the economy in developing countries is mainly from the important contribution of the banking system because the financial system has not developed synchronously (Naceur and Ghazouani, 2007), the market securities are nascent. In Vietnam, the operation of commercial banks has long been considered the lifeblood of the economy. Along with the development of the stock market, the capital channel through banks continues to develop and plays a key role in providing capital in the market, accounting for 70%. By the end of 2019, the outstanding credit balance to the economy was nearly VND 8.2 trillion. From the gaps in research and practice, this paper investigates the relationship between banking development and economic growth in terms of trade openness and inflation: empirical evidence in Vietnam

1. LITERATURE REVIEW

There are many empirical studies on this topic to find out the direct causes and influences of banking development and economic growth. In fact, it is argued that poor countries with a weakened financial system will be stuck in a vicious cycle in both the banking sector and the stock market, resulting in low economic efficiency that is less efficient. Low economic performance leads to low financial development. Indeed, an inadequately regulated financial system can be vulnerable to crises, with potentially devastating effects on the economy (Moshirian and Wu, 2012). In contrast, an efficient financial system, with well-developed banking and stock markets, will provide better financial services, allowing the economy to accelerate growth (King and Levine et al., 1993). In addition, financial development is not only for the development of the financial system alone but also for the poor, Demirguc-kunt and Levine (2009) in their study showed that financial development helps the poor to start catch up with the rest of the economy faster. Based on the theory of endogenous growth, Bencivenga and Smith (1991) emphasized that the development of the financial system (development of the banking industry and the stock market) is an important factor promoting economic growth. In the long term, as financial development can facilitate economic growth through multiple channels. These channels include: providing information on possible investments, for efficient capital allocation; supervise companies and exercise corporate governance; spread risks; mobilize savings; expanding the exchange of goods and services and the transfer of technology. The results of empirical research on the relationship between financial development and economic growth have been proven and classified into three groups on the direction of the relationship, which is the relationship according to the supply - leading hypothesis, the demand-following hypothesis and the feedback hypothesis relationship.

King and Levine (1993), used data from 80 countries to analyze the effect of financial sector development on economic growth GDP, with variables to measure for banking and market development. stock. After controlling for other factors affecting economic growth, a strong positive relationship was found between banking development and economic growth. Bonin and Watchel (2003) strongly agree with the view that well-functioning financial intermediation has a significant impact on economic growth. When studying the relationship between financial development and economic growth, Johannes et al (2011) used an endogenous growth model based on time series data from 1970 to 2005 in Cameroon to regression and concluded that stock market and banking development are decisive factors for sustainable economic growth. In which, control variables such as government consumption, trade openness and investment rate are basic factors in the growth equation that established a long-term positive relationship between financial development and economic growth. economic growth. Hence, it is proposed that in order to increase the positive efficiency of the financial sector, many reforms must be directed towards improving and enhancing efficiency in resource allocation, providing an accounting, legal and good institutions to develop the stock market and banking. Sehrawat (2014) also examined the relationship between financial development and economic growth in India through the ARDL model using data from 1982 to 2012. The study results confirmed the relationship. long-term close relationship in financial

development, positive impact on economic growth through credit channels and private sector investment. In addition, trade openness and consumer price index also affect economic growth. Colombage (2009) provided empirical evidence on the relationship between financial development and economic growth in five industrialized economies (Canada, Japan, Switzerland, the United Kingdom and the United States) through used the VECM model to test the time series data set from 1995 to 2006, and found a unilateral causal relationship going from banking development to economic growth in Canada. The establishment of a well-developed financial system, especially a sound financial intermediary, is important for efficient credit allocation that can help maintain high and sustainable economic growth. Studying the relationship between banking sector development and economic growth in Lebanon, Awdeh (2012) used data from 1992 to 2011 and applied endogenous growth theory found a positive relationship. One-way causality from economic growth to the banking sector is the growth of deposits and credit to the private sector. In contrast, credit is provided by banks to the residential private sector, and the size and efficiency of the banking sector do not significantly affect economic growth in Lebanon. In a study by Zang and Kim (2007) examining the causal relationship between financial development and economic growth in East Asian countries on the panel dataset provided by Levine (2000). The results of the study show that there is substantial evidence that economic growth promotes development finance. Economic growth will create more demand for financial services so the financial system will grow in response to economic expansion and demand because as economic activities grow, there will be demand more for both capital and liquidity. Liang and Teng (2006) studied for the Chinese case only and found that there exists a unilateral causal relationship from economic growth to financial development in general and banking development in particular. At the same time, trade openness also has a positive impact on economic growth in China as economic growth will increase competition and efficiency in the financial markets, as the end result of economic growth will be increased. That is the economy will increase the demand for capital and financial services. In the same period as Liang and Teng (2006), a separate study for the Malaysian case using the VECM model, Ang (2007) found financial liberalization, through the removal of financial control policies. has had a favorable effect in stimulating the development of the financial sector, and at the same time, economic growth has a positive impact on financial development. Eng and Habibullah (2011), using the GMM method when testing the relationship between financial development and economic growth in countries located in Africa, Asia, Europe and the Western Hemisphere with time series data The period from 1990 to 1998 found a unilateral causal relationship from economic growth to private sector credit in the countries of the Western Hemisphere. Shan (2001), examining the relationship between financial development and economic growth in nine OECD countries and China, used a VAR model that demonstrated that economic growth helps financial development.

The supply leading hypothesis exists in the early stages of the economy, while the serial demand hypothesis will prevail in the period after economic growth. Thus, the causal direction between financial development and economic growth changes during development. Financial development can create real innovation through investment to help the economy grow (this stage occurs in a supply-led relationship). When the economy has achieved growth, then the demand for financial products and services is more, then it is the turn of economic growth to return to stimulate the development of the financial system. However, this will relate mainly to the turn-around time of industries in the economy, especially government policy. The causal relationship of financial development and economic growth can be explained from two angles. Firstly, from the perspective of the continuation demand hypothesis, as the economy develops, the economy's demand for new and different financial services increases and these needs are met rather passively. if the financial system does not develop in time corresponding to the needs of the economy. In the second view of the supply-led hypothesis, financial development first generates real growth by allocating scarce resources from small savers to large investors. In empirical research on the relationship between economic growth, banking sector development, stock market in 47 countries, Levine and Zervos (1988) found a two-way causal relationship between banks, stock market and economic growth. Hassan et al. (2011) also find a two-way causal relationship between banking development and economic growth in low-income countries such as East Asia and Latin America, where private sector credit Human factor is an important factor for economic growth and vice versa, growth helps credit to develop. Demetriades and Hussein (1996) studied the direction of the impact of financial development on economic growth in 16 countries in the period 1960-1990 and found a positive interaction of the causal relationship between financial mainstream and growth in Thailand and Korea.

Trade openness can stimulate economic growth by expanding access to large-scale high-income markets as well as low-cost access to high levels of science and technology. . However, openness to trade can also lead to greater economic vulnerability through trade shocks or financial shocks (Yanikkaya, 2003). Low level of trade openness is also sufficient for financial relations and growth in high-income countries because these countries already have most of the high-income and middle-income markets available. Financial space can help with this process. In contrast, low-income countries need a higher degree of trade openness for the growth-finance

140

relationship, because they can benefit from access to high levels of technology and large potential markets. capacity when expanding trade openness. The effect of trade openness on financial relations and growth seems to stem from the impact of international trade on the overall macroeconomic performance of an economy. Thus, while the trend towards trade openness can have both positive and negative effects on economic growth, it can also have an impact on the financial relationship and growth. On the one hand, openness to trade can lead to enhanced macroeconomic performance by providing low-cost access to inputs and new commodities, large markets and modern level of science and technology (Yanikkaya, 2003). At that time, the increased efficiency in all economic sectors should lead to the efficient use of capital resources allocated by the banking system. Thus, openness to trade can enhance the positive impact of financial development on economic growth. On the other hand, trade openness can weaken financial ties and growth if international trade constrains nascent domestic industries. Trade openness can also create macroeconomic instability and vulnerability to shocks occurring globally and thus can negatively impact financial relations. mainstream and growth. Therefore, the possible effect of trade openness on the financial relationship and growth remains unclear. This depends on the economy's position in international trade, where the relationship between finance and growth could tighten in economies better positioned in international trade.

The strong development of the banking system will encourage higher capital mobilization and efficient use of capital allocation for investment projects. However, when inflation occurs, there will be effects on economic growth. Inflation increases transaction costs, which inhibits economic growth. Inflation affects financial depth and also has a direct effect on growth. Inflation reduces the ability of financial intermediaries to improve resource allocation, suggesting that the effect of financial depth on growth is also attenuated when inflation is high. When inflation exceeds the threshold, finance is no longer effective for economic growth, and at the same time, the study also finds that the change in financial depth is inversely proportional to inflation in a low inflation environment and deflation will have a negative impact. positive of financial depth on growth. Inheriting and extending the work of Rousseau and Yilmazkuday (2009) through the threshold regression analysis approach found that when the inflation rate is between 4% and 19% , then the financial-growth relationship is less affected. However, beyond this threshold, growth is poor and finance is constrained. Mostafa Sargolzaei et al (2019) when studying the role of inflation in the relationship between financial development and economic growth in OPEC countries in the period from 1970 to 2015 found that when the If the inflation rate exceeds the threshold of 20.33%, the impact of financial development on economic growth in OPEC economies will decrease and even become negative.

2. METHODOLOGY

2.1 Research data

The research data of the paper was collected from the first quarter of 2000 to the fourth quarter of 2019 based on the following reliable sources:

- First, the International Financial statistics data source is on the IMF website https://data.imf.org.
- Second, the data source of the General Statistics Office of Vietnam (GSO) on the website https://www.gso.gov.vn.

2.2 Research method

The paper uses ARDL method to test the relationship between data series in the research model because the characteristics of data timeseries in Vietnam is the most suitable. Choosing ARDL with following reasons:

Firstly, the VAR model was first proposed by Princeton University professor Chrisphopher Sims in 1980 and has now become one of the most successful methods for macro-empirical analysis, especially in the field of macro-empirical analysis. monetary sector. However, the condition of VAR is that the time series must be stationary series of the same order I(0), but in practice the original data series are usually non-stationary and the limitation of the VAR model is that it can only be considered. short-term relationships.

Second, the VECM model overcomes the disadvantage of VAR that is to consider the relationships both in the short and long term. However, the VECM model is only suitable for long time data series, and the data series both stop at first difference I(1) and co-exist.

Third, the ARDL-ECM model overcomes the disadvantages of the VAR and VECM models that are: the data series may not stop at the same order I(0) or I(1), but no series stops at the same time. I(2) and co-existence

sequences. At the same time, ARDL is suitable for models with small sample sizes such as time series data conditions in Vietnam.

Fourth, the ARDL model is capable of using different lags of the variables (Ozturk and Acaravci, 2011) while the Engle-Granger and Johansen method cannot apply different lags.

2.3 Research Variables

Economic growth (GROWTH)

Economic growth is an increase in the production capacity as well as the supply of goods and services in the economy. In previous studies, many measures were used to measure economic growth variables such as real GDP growth rate to measure the country's total productivity or real GDP growth per capita (Beck et al., 2000; Khan and Senhadji, 2000; Levine et al., 2000). Real GDP growth rate reflects the production capacity of the economy, so the thesis is used to represent economic growth. Real GDP has been used by many studies such as those of Kar and Agir (2011); Abu-Bader and Abu-Qarn (2008); Liang and Teng (2006); Beck and Levine (2004). The choice of real GDP has many advantages. First of all, GDP is by definition one of the most important measures to assess the activity, stability and growth of goods and services in an economy, and GDP is often viewed from two angles as GDP. nominal and real GDP. In which, real GDP considers adjustment for the impact of inflation. This means that if inflation is positive, then real GDP will be lower than nominal GDP and vice versa. If real GDP is not adjusted for inflation, then positive inflation will significantly increase nominal GDP. Thus, real GDP is a better basis for assessing the performance of the national economy in the long run than using nominal GDP.

Banking Development (BSD)

As a result of a review of the index to measure banking development that has been suggested in previous studies as an expansion of money supply (Arestis and Demetriades, 1997) and the domestic credit index (Kar and Agir, 2011). However, Khan and Senhadji (2000) argue that the expansion of money supply is not yet an indicator of banking development because it is more related to financial intermediaries providing services. is the mobilization of idle capital for lending; Meanwhile, the debt ratio does not accurately reflect the ability to provide financial services in an economy (Levine et al., 2000); The domestic credit index also includes credit extension of commercial banks, central banks and non-bank financial institutions, so the author will exclude in this study. Therefore, for this study, an appropriate selection of a bank development measure is very important to be able to provide a comprehensive picture of banking development in Vietnam and its ability to allocate capital. efficiency of banks to all sectors of the economy for investment, production and business. Currently, the nature of Vietnam's economy is a banking-based economy because banks play a key role in Vietnam's financial system. Therefore, in order to measure banking development, the thesis will measure multidimensionally according to the measurement methods of the World Bank and the IMF, which is in the direction of financial depth and financial efficiency through two indicators that are: *the domestic credit rate to the private sector provided by the bank (CRB) and the spread between the deposit and lending rates (IRS).*

Trade Openness (OPE)

In the studies of Beck (2002); Beck and Levine (2004) trade openness is an indispensable factor when considering the relationship between economic growth and financial development. The significant contribution of trade openness to economic growth and financial development in countries has been shown by researchers such as Liang and Teng (2006) study in China, Menyah et al. (2014) study in South Africa, showing that trade openness has a very positive impact on economic growth and financial development. Trade openness has made it easier for a country to access advances in technological knowledge from its trading partners. In particular, the openness of trade in developing countries makes it easier to access investment and exchange goods for economic development (Yanikkaya, 2003). This index is calculated by taking the sum of exports and imports divided by GDP. However, excessive trade openness (to a maximum) will negatively affect the relationship between finance and economic growth in low- and low-income countries. low average. Therefore, the variable trade openness is expected by the author to have an impact on banking development and economic growth.

Inflation (INF)

In the empirical studies of Sehrawat (2014) found the negative impact of inflation on economic growth when considering the relationship between banking development and economic growth. In fact, inflation not only affects growth but also affects bank performance because inflation will directly affect the amount of

deposits in banks of people and organizations in the economy. thereby affecting the capital to lend to banks. High inflation will increase the cost of capital mobilization, so it directly affects the bank's financial performance index. However, inflation does not always negatively affect the relationship between finance and growth. Mostafa Sargolzaei et al (2019) determined the inflation threshold for the relationship between finance and growth and found that finance only positively affects growth when inflation can be within a specific threshold. When inflation exceeds the threshold, finance is no longer effective for economic growth. Similarly, this variable is expected by the author to have an impact on banking development and economic growth.

2.4 Reseach model

The ARDL model applied in this study is as follows:

$$GROWTH_t = \alpha_{10} + \beta_{11}BSD_t + \beta_{12}OPE_t + \beta_{13}INF_t + \beta_{14}OPE_t.BSD_t + \beta_{15}INF_t.BSD_t + \varepsilon_{1t} \quad (1)$$

$$BSD_t = \alpha_{20} + \beta_{21}GROWTH_t + \beta_{22}OPE_t + \beta_{23}INF_t + \beta_{24}OPE_t.GROWTH_t + \beta_{25}INF_t.GROWTH_t + \varepsilon_{2t} \quad (2)$$

3. RESULTS AND DISCUSSION

3.1 Unit root test

Investigating cointegration by applying ARDL bounds testing is not influenced by the order of integration of variables. However, empirical studies have suggested that the existence of a second-order integrated I(2) variable can produce spurious estimations in the regression model. Therefore, to ascertain the variable order of integration, we estimated the stationary test by applying the ADF test proposed by Dickey and Fuller (1979), the P-P test proposed by Phillips and Perron (1988). The stationary test estimations are shown in Table 1

Table 1. Unit root test estimation

Biến	I(0)		I(1)	
	ADF	PP	ADF	PP
GROWTH	0,0042***	0,0094***	0,0000***	0,0000***
CRB	0,8185	0,9220	0,0000***	0,0000***
IRS	0,0020***	0,0017***	0,0000***	0,0000***
OPE	0,0840*	0,3398	0,0000***	0,0000***
INF	0,3210	0,1669	0,0000***	0,0000***
OPECRB	0,7256	0,9758	0,0000***	0,0000***
OPEIRS	0,0035***	0,0076***	0,0000***	0,0000***
OPEGROWTH	0,0011***	0,0040***	0,0000***	0,0000***
INFCRB	0,3578	0,1910	0,0000***	0,0000***
INFIRS	0,1062	0,0908*	0,0000***	0,0000***
INFGROWTH	0,2347	0,1736	0,0000***	0,0000***

Notes: ***,**, * at 1%, 5% and 10% significance levels

The results of unit root test by ADF and PP methods show that the data series is stationary at the original series I(0) with a significance level of 1% including economic growth variables (GROWTH), interest rate spread (IRS), interactive variable OPEIRRS, interaction variable OPEGROWTH . With Trade Openness (OPE) stops at series I(0) with significance level of 10% when using ADF method and PP method is not stationary. Therefore, for the variables that do not stop at I(0), the thesis has taken the first difference of order I(1) and all of them stop at the significance level of 1% with the difference of order I(1).

3.2 ARDL bounds testing

As developed by Pesaran & Shin (1998) and Pesaran et al. (2001) ARDL bounds testing Technique has been applied. ARDL bounds test was carried out with a maximum lag of 3 using Bayesian Information Criteria. The results are reported in Table 2

Table 2. Cointegration test results

ARDL	F-Statistic	Outcome	
Model 1a: F(GROWTH)=(GROWTH/ CRB, OPE, INF, OPECRB, INFCRB)			
(1,1,2,0,2,0)	3.317	No- Cointegration	
Model 1b: F(GROWTH)=(GROWTH/ IRS, OPE, INF, OPEIRS, INFIRS)			
(3,4,1,0,3,2)	2.011	No- Cointegration	
Model 2a: F(CRB)=(CRB/ GROWTH, OPE, INF, OPEGROWTH, INFGROWTH)			
(1,1,1,0,4,0)	1.839	No- Cointegration	
Model 2b: F(IRS)=(IRS/ GROWTH, OPE, INF, OPEGROWTH, INFGROWTH)			
(3,2,3,2,2,4)	9.937***	Cointegration	
Critical values			
1%		5%	
Lower	Upper	Lower	Upper
3.41	4.68	2.62	3.79

Notes: ***significance at 1% level

The cointegration test results in Table 2 show that:

- For model 1a, model 1b and model 2a, all F-statistics are less than the upper bound limit value at all significance levels, so there is no cointegration in these models.
- For model 2b, the F-statistic is larger than the upper-boundary limit at all significance levels, so cointegration exists in this model. The results relationship are reported in Table 3.

Table 3. Estimated Coefficients of model 2b

Variable	Coefficient	Standard Error	t-Statistic	Probability
Long run coefficients				
GROWTH	6.884837	1.869698	3.68	0.001***
OPE	1.032294	0.2887152	3.58	0.001***
INF	0.7717637	0.3384929	2.28	0.027**
OPEGROWTH	-0.1463859	0.0407042	-3.60	0.001***
INFGROWTH	-0.1021889	0.0507508	-2.01	0.049**
C	-17.41026	4.610054	-3.78	0.000
R-squared		65.39%		
Adj R-squared		51.93%		
Breusch-Godfrey LM		0.7661		
Ramsey Reset		0.2592		
Heteroskedasticity		0.8543		
Normality		0.2358		
Short run coefficients				
ΔGROWTH	-2.28352	0.5543	-4.12	0.000***
ΔGROWTH(-1)	-1.940834	0.4712634	-4.12	0.000***
ΔOPE	-0.2532239	0.0870621	-2.91	0.005***
ΔOPE(-1)	-0.3422501	0.0820159	-4.17	0.000***
ΔOPE(-2)	-0,0386453	0.0155662	-2.48	0.016**
ΔINF	-0.5453574	0.1264457	-4.31	0.000***
ΔINF(-1)	-0.1400147	0.1105885	-1.27	0.211

ΔOPEGROWTH	0.0394179	0.0121378	3.25	0.002***
ΔOPEGROWTH(-1)	0.0469506	0.0110354	4.25	0.000***
ΔINFGROWTH	0.0747369	0.0181118	4.13	0.000***
ΔINFGROWTH(-1)	0.0338453	0.0164926	2.05	0.045**
ΔINFGROWTH(-2)	-0.0072738	0.0044694	-1.63	0.109
ΔINFGROWTH(-3)	-0.0074398	0,0033243	-2.24	0.029 **
ECM(-1)	-0.3780754	0,0629799	-6.00	0.000

Notes: ***,**, * at 1%, 5% and 10% significance levels

The diagnostics tests were carried out and model passed all the tests. There is no serial correlation, no heteroskedasticity (White). The functional form is correctly specified as depicted by Ramsey RESET Test. The normality test indicates that residuals are normally distributed. The Tests Results are also given in Table 3.

Table 3 shows that in the long run: Economic growth has a positive impact on the interest rate differential at 1% significance level, when economic growth increases by 1%, promoting banking development (efficiency) increases by 6.9%. The results of this study support the demand - following hypothesis and are consistent with previous studies by Awdeh (2012), Liang and Teng (2006), Ang (2007). The regression coefficient of long-term trade openness shows a positive effect on the interest rate differential. The results of trade openness indicate that a 1% increase will boost (effective) banking development by up to 1.03% in Vietnam. The results of this study show that the Vietnamese economy follows the classical growth theory and the endogenous growth theory, which is the trade openness that contributes to the economic growth in Vietnam through the banking system. The results of this study are consistent with previous studies by Huang and Temple (2005). Although, trade openness has positive effects on banking development (efficiency), however, the thesis will continue to study how much is the threshold value of commercial openness for banking development positive impact on economic growth in Vietnam. The regression coefficient of inflation is 0.77 at 5% significance level. This shows that inflation has a positive impact on banking development (efficiency). This result is consistent with previous research by Tan and Floros (2012). This result shows that inflation does not always cause negative effects to all sectors of the economy. However, in order to specifically determine the inflation threshold, the impact of banking development towards financial efficiency or financial depth on economic growth will be appropriate. threshold of inflation. Regression results ARDL model 2b, also found the opposite effect of two interacting variables OPEGROWTH and INFGROWTH on IRS at the significance level of 1% and 5%, respectively. A 1% increase in OPEGROWTH and INFGROWTH will decrease the IRS by 0.15% and 0.1% respectively.

The coefficient ECM(-1) has a negative sign and is statistically significant, showing that the long-run causality runs from GROWTH, OPE, INF, OPEGROWTH, INFGROWTH to GDP. The negative sign of the ECM coefficient indicates a move back to equilibrium (Granger, 1987). Furthermore, it is observed that the regression coefficients of the long-run relationship show a significant impact of all variables in model 2a on the IRS during the study period. An ECM coefficient of -0.3781 implies that, when a certain economic growth policy is implemented in terms of trade openness and inflation (i.e. short-run values increase (decrease) – If the value of bank development (effective) deviates from the long-run equilibrium curve, then in the next period (3 months later), the values of these effects will tend to return to the equilibrium position with the level of adjustment to the equilibrium position (equilibrium line in the long run) is 37.81%.

The short-run coefficients in Table 3 show the dynamic adjustment of the variables towards the long-run equilibrium. Table 3 shows that economic growth has a negative impact on the interest rate difference immediately and after 1 period. Similarly, OPE, INF, OPEGROWTH and INFGROWTH also show results in the short run that are opposite to those in the long term. Specifically, trade openness has a negative impact on the instantaneous interest rate difference, after 1 period and 2 periods, while inflation has the opposite effect on the instantaneous interest rate differential. Trade openness interacts with economic growth and inflation interacts with growth has a positive impact on the interest rate differential in the immediate and after 1 period. 1% increase in trade openness interacts with economic growth and 1% increase in inflation interacts with growth will increase the interest rate differential by 0.039%, 0.047%, 0.075% and 0.033 respectively. %. This implies that the elasticity of (efficient) banking development by trade openness interacting with economic growth and by inflation interacting with economic growth is inelastic but positive and positive. statistical significance.

3.3 CUSUM (cumulative sum) and CUSUMSQ (cumulative sum of squares) tests

The stability of long run and short run parameters was checked through CUSUM Test and CUSUMSQ Test. The parameters are stable as plot of Cumulative Sum of Recursive Residuals in Fig. 5 and Plot of Cumulative Sum of Squares of Residuals in Figure 1 are within 5% confidence interval of parameter stability. This confirms that long run and short run relationship are stable.
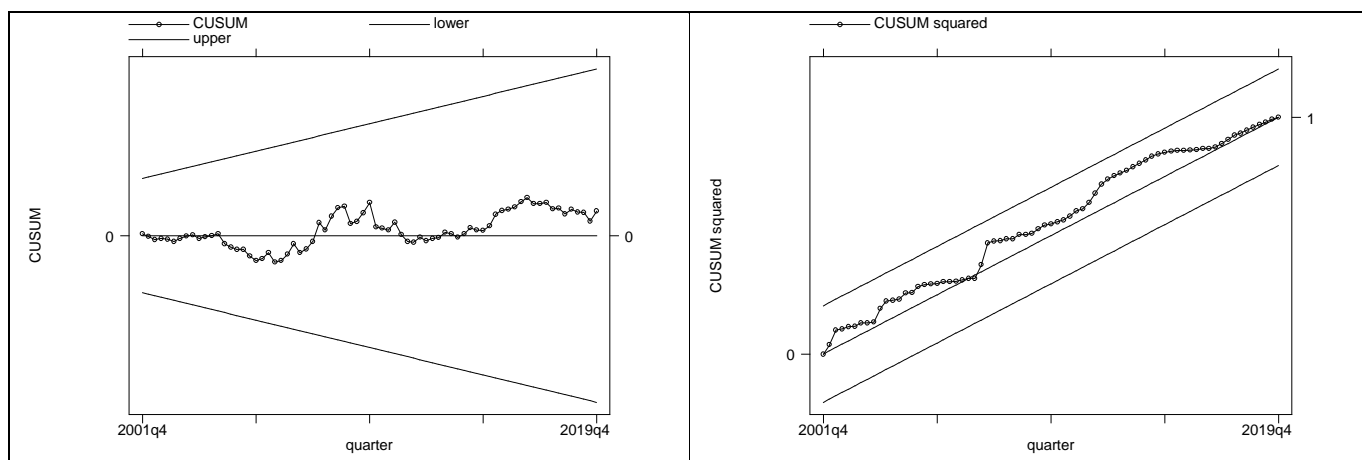
The straight lines represent critical bounds at 5% significance level

Figure 1. Plot of CUSUM, CUSUMSQ Test for Equation.

Next, the study will determine the threshold point of trade openness and inflation. The threshold score was determined through Bayesian information criterion (BIC), Akaike information criterion (AIC) or Hannan-Quinn information criterion (HQIC). By using the threshold regression method, the author will analyze the threshold value of trade openness and inflation to determine specifically at what level of trade openness and inflation in which banking development has a positive or negative impact on economic growth in Viet Nam.

Table 4. Result of the trade openness threshold

Threshold OPE	32.86			
GROWTH	Coef	Std. Err.	t-Statistic	Probability
Region 1				
dCRB	-0.0345263	0.0436155	-0.79	0.429
IRS	0.1963727	0.1527296	1.29	0.199
C	5.911683	0.6086843	9.71	0.000
Region 2				
dCRB	0.0697404	0.02229	3.13	0.002***
IRS	0.5605203	0.1965622	2.85	0.004***
C	5.052212	0.5731792	8.81	0.000

Notes: ***significance at 1% level

The results in Table 4 show that the threshold value of trade openness is determined to be 32.86%. This is the value that divides the two regions before and after the threshold where the impact of banking development on economic growth is positive or negative. With a trade opening of less than 32.86%, it shows that banking development is not statistically significant. This shows that, with a trade openness of less than 32.86%, domestic credit from the private sector provided by banks and interest rate differentials do not contribute to economic growth in Vietnam. However, with the area above the threshold of 32.86%, it shows that CRB and IRS have a positive impact on GROWTH or in other words, when the commercial openness is greater than 32.86%, banking development has a positive impact on GROWTH. economic growth in Vietnam. This is consistent with the research of Iyke et al (2016), Huang and Temple (2005).

146

Table 5. Result of the inflation threshold

Threshold INF	9.19			
GROWTH	Coef	Std. Err.	t-Statistic	Probability
Region 1				
dCRB	0.0868454	0.0260892	3.33	0.001***
IRS	0.1441337	0.1153604	1.25	0.212
C	6.216487	0.376532	16.51	0.000
Region 2				
dCRB	-0.0219538	0.0288704	-0.76	0.447
IRS	1.224716	0.2932326	4.18	0.000***
C	2.594127	0.9682877	2.68	0.007

Notes: ***significance at 1% level

The results in Table 5 show that, with an inflation rate below the threshold of 9.19%, only domestic credit in the private sector has a positive impact on economic growth at the 1% significant level, while the difference in margin is limited. interest rate difference is not statistically significant, so it does not affect economic growth. This shows that banking development has a positive impact on economic growth through domestic credit to the private sector when the inflation rate is below 9.19%. And vice versa, with an inflation rate above the threshold of 9.19%, we find a positive impact on economic growth through the interest rate differential at 1% significance level, while domestic credit for the private sector is not statistically significant, so it has no impact on economic growth. This means that when the inflation rate is above 9.19%, banking development has a positive impact on economic growth through the interest rate differential. Thus, when inflation is high, interest rates are an effective management tool in the economy.

CONCLUSION

Research results show that banking development is affected by economic growth, trade openness and inflation. Therefore, in order for the bank to promote and take advantage of the economic growth and the expansion of trade openness. The Vietnamese government needs to focus on perfecting credit policies to facilitate the private sector in the manufacturing sector to access loans. Because the growth rate of the private sector is always maintained, accounting for about 50% of GDP, attracting about 85% of the labor force of the economy, making an important contribution to creating jobs, increasing income income of the people and in mobilizing social resources for investment and development of production and business. Therefore, developing the private economic sector is also creating conditions to free up development resources in society. Thus, when the bank perfects and expands its credit policy to finance capital for the private sector, it will both help the bank achieve its business goals and facilitate the efficient allocation of capital in the economy. economic. On the other hand, continuing to promote cooperation and expand trade with countries, especially key markets, and especially, it is necessary to have policies to attract multinational economic groups to invest in Vietnam. Vietnam in the fields of export production has potential. The research results show that the interest rate differential is affected by economic growth, trade openness and inflation. This shows that the interest rate management tool is very important for the Vietnamese economy. The interest rate policy must ensure that it does not cause market shocks, ensure stability, and fulfill the objectives of controlling inflation and economic growth. Operating monetary policy flexibly but cautiously, closely combined with macroeconomic policies in order to stabilize the macro-economy, contribute to stable economic growth and ensure the safety of commercial banks' operations. commercial.

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Does Risk Management and Intellectual Capital Improving SME's Performance during Covid-19 Outbreak?

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ARTICLE INFO

ABSTRACT

Covid-19 has triggered the collapse of SME businesses. Nevertheless, most SMEs in developing countries have not implemented risk management practices, including Indonesian SMEs. Also, SMEs need to optimize their intellectual capital capacity in facing emerging issues like COVID-19. This study aims to prove the role of risk management practice and intellectual capital in improving competitive advantage and SME performance. This study was conducted on 438 SMEs in the Bali Province, Indonesia. The survey is conducted by sending a questionnaire directly to SME owners or managers. This study evidences that risk management supports SMEs to create a competitive advantage. Nevertheless, risk management is not directly improving the SME's performance. Although risk management cannot directly increase SME profits, risk management helps SME owners to focus on managing the negative risks posed by the Covid-19 pandemic. SMEs maintain employees' productivity by innovating or creating new products. The creativity ultimately creates a competitive advantage that will increase the SME's performance. Therefore, competitive advantage completely mediates the relationship between risk management and performance. Other findings state that three elements of intellectual capital support the research hypothesis. Human capital contributes to developing new ideas with competitive differentiation. Structural capital encourages employee knowledge collaboration to innovate continuously. Meanwhile, relational capital allows organizations to create innovation with stakeholders. Human and structural capital also strengthens the influence of risk management on competitive advantage. Specifically, the moderation test result represents that relational capital has a lower contribution than human and structural capital. The last, competitive advantage positively affects SME performance. The finding indicates that competitive advantage enables SMEs to adapt to the Covid-19 impact, which leads to increased performance.

INTRODUCTION

Covid-19 has triggered the collapse of SME businesses, especially in developing countries. As many as 80% of SMEs experienced a decline in income, delays in loan payments, a reduced number of employees, and failure to maintain business continuity (Nordhagen et al., 2021). The performance decline is uncontrollable because most SMEs have not applied risk management in business processes (Lima et al., 2020). SMEs also have limited resources, so they cannot optimize their intellectual capital capacity. This condition causes SMEs to be unable to adapt quickly to pandemic conditions. Therefore, there is a substantial need to conduct studies on SME performance in developing countries.

This research is based on three research motivations. First, most SMEs in developing countries have not implemented risk management even though economic conditions are vulnerable to risks, challenges, and uncertainty (Silva et al., 2019). This condition increases risk exposure for SMEs. Limited human resources reliable in managing business risk also increase business failure risk (Yang et al., 2018). These limitations encourage researchers to identify risk management practices in developing countries, particularly Indonesia. SMEs as the pillar of the Indonesian economy, more than 57% of Indonesia's total GDP. However, the Covid-19 pandemic overthrew 80% of SMEs (Lutfi et al., 2020). Therefore, SMEs must proactively adopt risk management to ensure sustainability.

Second, academic studies that discuss risk management practices in SMEs are still limited (Lima et al., 2020; Rehman & Anwar, 2019), particularly in Indonesia. Most of the literature only discusses risk management in the financial sector (Adam et al., 2021; Nguyen & Vo, 2020; Rustiarini & Suryandari, 2021). Several findings in large companies also have inconsistent results. Several studies reveal that risk management practices improve company performance (Malik et al., 2020; Soltanizadeh et al., 2016). Nevertheless, other studies do not find a significant performance (Alawattegama, 2018; Quon et al., 2012).

Third, organizations must create competitive advantages in facing emerging issues like COVID-19. SMEs not only need to implement effective risk management but also need to maximize intellectual capital to respond to the impact of unexpected environmental changes (Girangwa et al., 2019). This study conducts a comprehensive study examining the interaction of risk management and intellectual capital in improving SME performance.

This study aims to prove the role of risk management practices and intellectual capital on competitive advantage. This study also identifies the role of the three elements of intellectual capital (human, structural, and relational capital) in strengthening the influence of risk management on competitive advantage.

The results provide theoretical, practical, and policy contributions. Theoretically, the findings support the Resources-Based View (RBV) theory to maximize intangible assets to improve SME performance. This study also raises the importance of risk management and intellectual capital as a competitive advantage for SMEs. Practically, this study builds consciousness of the position of risk management in dealing Covid-19 pandemic. This finding also encourages SME owners or management to increase the SME's internal capacity. In the policy context, the findings provide insight to decision-makers and stakeholders to focus on internal processes, such as implementing adequate risk management and maximizing the potential of intellectual capital.

The rest of the article deals with literature review and hypothesis development. The third part describes the research method, while the fourth describes and discusses the research results. The last section concludes and presents the implications of the results and discusses the limitations and suggestions for further research.

1. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

1.1 Resource-based view (RBV) theory

RBV theory provides a framework to integrate risk management as part of an SME's strategy. RBV helps SMEs identify priority risks and focus on those that have the most significant impact on SMEs (Barney, 1991; Girangwa et al., 2019). RBV theory also underlines the position of intellectual capital to improve organizational performance. RBV uses two main capabilities to manage intangible assets: dynamic and adaptive capabilities. Dynamic capabilities leverage the organization's internal capacity to respond to market and environmental changes. Likewise, adaptability encourages organizations to proactively seize opportunities, adapt, and manage internal resources (Anwar, 2018).

1.2 Risk management, competitive advantage, and performance

In the SME context, owners tend to formulate competitive strategies that are less risky but provide a stable position. Based on risk information, SMEs identify and manage business risks to make business decisions. Understanding business risks helps SMEs adapt to a changing dynamic and competitive environment. Effective risk management makes SMEs develop riskier business strategies and facilitates organizations to create competitive advantages (Armeanu et al., 2017; Yang et al., 2018). The empirical evidence finds that effective risk management improves SME performance in many developing countries such as Kenya (Girangwa et al., 2019) and Pakistan (Yang et al., 2018). Thus, risk management improves organizational performance (Rehman & Anwar, 2019; Saeidi et al., 2021; Soltanizadeh et al., 2016). The following hypothesis is:

H1: Risk management practices positively affect competitive advantage.

H2: Risk management practices positively affect performance.

1.3 Intellectual capital and competitive advantage

The human resource-based view reveals that an organization should utilize tangible and intangible assets to create a competitive advantage (Barney, 1991). Intellectual capital has more potential to increase the competitive advantage of SMEs than large companies. The flexibility in SMEs' organizational structures and informal business strategies emphasize the position of intellectual capital. Some literature reveals that intellectual capital contributes to SMEs' competitiveness and value creation (Demartini & Beretta, 2020; Ramírez et al., 2021; Xu & Li, 2019).

Intellectual capital includes three elements: human capital, structural capital, and relational capital (Bontis, 1998). Human capital comprises competencies, innovation, knowledge, and member skills that integrate into organizational resources. Human capital contributes to developing new ideas and products with competitive differentiation (Agostini et al., 2017; Kianto et al., 2017). SMEs with limited physical and financial resources should emphasize the importance of employee experience and skills. Employees must also constantly innovate to form a competitive advantage (Beltramino et al., 2021; Ramírez et al., 2021).

Structural capital includes the structures and mechanisms of organizations that support the human capital to achieve optimal performance. Structural capital consists of processes, systems, and corporate culture (Jain et al., 2017). Structural capital allows organizations to develop stakeholder relationships to increase competitive advantage and organizational performance (Beltramino et al., 2021; Ramírez et al., 2021; Xu & Li, 2019).

Relational capital denotes the organization's capacity to interrelate positively with external stakeholders. SME management and employees tend to have direct and close contact with customers to enhance innovation (Agostini et al., 2017; Beltramino et al., 2021). However, another study revealed that

relational capital could not be a value driver for SME performance (Xu & Li, 2019). The study formulates the following hypotheses:

H3a: Human capital positively affects competitive advantage.

H3b: Structural capital positively affects competitive advantage.

H3c: Relational capital positively affects competitive advantage.

1.4 Enterprise risk management, intellectual capital, and competitive advantage

RBV theory reveals that internal organizational resources create corporate value and improve sustainable performance (Barney, 1991). Risk management and intellectual capitals are fundamental resources and strategic assets. Prior scholarships revealed that intellectual capital moderates risk management and SME performance (Girangwa et al., 2019). The following hypothesis is formulated:

H4a: Human capital strengthens the effect of risk management on competitive advantage.

H4b: Structural capital strengthens the effect of risk management on competitive advantage.

H4c: Relational capital strengthens the effect of risk management on competitive advantage.

1.5 Competitive advantage and performance

Competitive advantage is created by building, integrating, and reconfiguring internal and external organizational resources. Empirical studies prove that competitive advantage significantly affects performance (Anwar, 2018; Bapat & Mazumdar, 2015). The competitive advantage becomes a significant intermediary between internal organizational capacity and organizational performance (López-Cabarcos et al., 2015). Organizations must exploit their capabilities and resources to generate a competitive advantage. Several studies prove that competitive advantage is a mediator of intellectual capital and SME performance (Ibarra-Cisneros et al., 2020; Jain et al., 2017), business model innovation (Anwar, 2018), and organizational capability-performance (López-Cabarcos et al., 2015). Thus, the following hypothesis is:

H5: Competitive advantage positively affects performance.

H6: Competitive advantage mediates the relationship between risk management and performance.

The conceptual framework is shown in Figure 1.
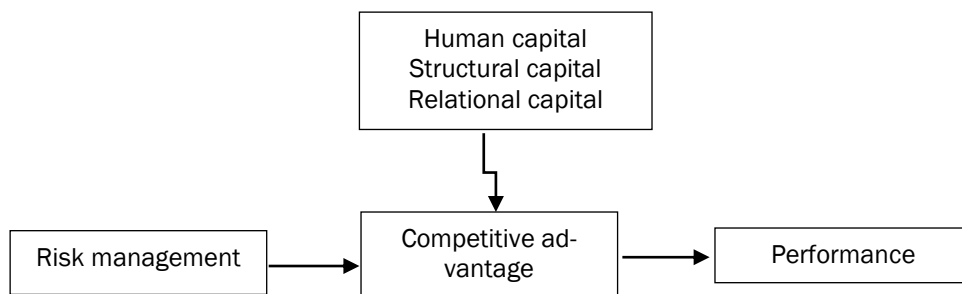
Figure 1. The conceptual framework

Source: own

2. RESEARCH METHODS

This study was conducted on 438 SMEs in Bali, Indonesia. The SMEs were selected based on purposive sampling, which has existed for at least three years and maintains business continuity during the pandemic. The survey is conducted by sending a questionnaire directly to SME owners or managers. Questionnaires are distributed for six months, from June until November 2021.

The risk management practices variable contains six indicators adopted from Sax and Torp's (2015) research. The indicators involve (1) policy for handling significant risks; (2) standard procedures for identifying major risks and opportunities; (3) opportunities and risks; (4) standard procedures for risk-reducing; (5) risk reports regularly; (6) standard procedures for monitoring significant risks. The questionnaire used a five-point Likert Scale.

Human capital mentions to the combination of organizational members' competencies, innovation, knowledge, and skills (Bontis, 1998). Human capital contains nine indicators, i.e., (a) having creativity, proactivity, and risk-taking; (b) measuring the risks of investments; (c) having knowledge for success; (d) applying the knowledge; (e) developing new ideas and knowledge; (f) having the capability to working, interact, and debating in teams; (g) committed and responsible to organizational strategy; (h) adapting to new situations; and (i) cooperating in the identification and resolution of the challenge. The questionnaire was adapted from Beltramino et al.'s (2021) research using a five-point Likert scale.

Structural capital includes mechanisms and organizational structures that support the human capital component to achieve optimal performance (Bontis, 1998). The questionnaire was adapted from Beltramino et al.'s (2021) research. Structural capital includes five indicators, namely opportunity for (a) collaboration in systems and structures; (b) exploration of innovative knowledge; (c) sharing of new knowledge; (d) support of collective behavior; and (e) creation and development new knowledge.

Relational capital is the organizational capability to interact positively with external stakeholders, such as customers, suppliers, and communities (Bontis, 1998). This construct contains five indicators. The questionnaire was adapted from Beltramino et al.'s (2021) research. These consist of organizational capability (a) to create innovation; (b) to advance new solutions; (c) to measure the environment image; (d) the creation of potential collaboration; and (e) to collaborate with third partners.

Competitive advantage is the SME's advantage in competition. The four indicators adopted from Jain et al. (2017) study which organizations have (a) access to resources at competitive rates; (b) ability to increase market share; (c) a good reputation of customers; (d) ability to attract the best talent from market place".

The SME's performance reflects non-financial and financial performance, such as productivity, cost reduction, profitability, sales growth, return on assets, customer growth, customer satisfaction, employee satisfaction, organizational reputation, and quality of products and services (Prieto & Revilla, 2006). SMEs self-reported their performance because it is not easy to obtain financial data. Also, SMEs do not publish their financial performance publicly (Rehman & Anwar, 2019). Although self-assessment is subjective, this method provides adequate, fruitful, and advantageous results. Researchers asked managers or owners to measure their SME performance over the past three years. The measurement uses a five-point Likert scale.

This study controls three variables such as type of industry, age, and assets. This study also compares the performance of three SME sectors, namely manufacturing, trade, and services (see robustness tests). Data were analyzed using Partial Least Square (PLS), including (a) outer model test, (b) inner model test, and (c) hypothesis testing.

3. RESULT AND DISCUSSION

3.1 SME characteristic

The characteristic of SMEs is shown in Table 1.

Table 1. SME's characteristics

Characteristics	Percentage
Type of SMEs:	
1. Manufacturing	59.36%
2. Trading	29.22%
3. Service	11.42%
Age of SMEs (years):	
1. 3-10	29.45%
2. 11-20	47.95%
3. 21-30	16.44%
4. >30	6.16%
The asset of SMEs:	
1. 50 million -500 million	77.63%
2. 500 million-10 billion	22.37%

Source: own

3.2 Common method bias

This study collected data using a self-reported questionnaire from the same time and source point. This condition leads to Common Method Bias (CMB) that affects validity results. Similar to previous studies (Anwar, 2018; Rehman & Anwar, 2019), this study conducted Harman's One Factor test, namely the Principle Component Analysis, to detect this threat. The test results revealed that eight factors had Eigenvalues above 1, and the first factor explained 39.234% of the variance (less than 50%). This figure confirms that there is no potential for CMB and further analysis.

3.3 Outer and inner model test

Based on Partial Least Square (PLS) analysis, the first step is testing the outer model. The convergent validity test shows a reliable indicator with a loading factor value ranging from 0.691-0.965. The value of composite reliability and Cronbach's alpha for all constructs is reliable, is above 0.7. The validity of each construct was measured with AVE and had a value of more than 0.5. The next step is to test the inner model to see the relationship between the constructs. The results reveal that intellectual capital positively affects competitive advantage once moderating risk management and competitive advantage (r = 0.808; 0.758; and 0.698). The risk management variable positively affect competitive advantage (r = 0.315) and SME performance (r = 0.380). Competitive advantage also positively affect SMEs performance (r = 0.581). Thus, all constructs show a positive relationship.

3.4 Hypothesis testing result

This study examines intellectual capital as a moderator between risk management and SME competitive advantage, as presented in Table 2.

Table 2. The result of moderating effects

Relationships	Original Sample	Sample Mean	Standard Deviation	T Statistics	p-Values	Conclusion
RM -> CA	0.128	0.134	0.101	2.274	0.024**	H1 Accepted
RM -> PF	0.076	0.070	0.066	1.160	0.247	H2 Rejected
HC -> CA	0.155	0.159	0.123	4.263	0.000***	H3a Accepted
SC -> CA	0.351	0.355	0.121	3.955	0.003***	H3b Accepted
RC -> CA	0.174	0.177	0.085	2.056	0.040**	H3c Accepted
HC*RM -> CA	0.248	0.253	0.098	5.486	0.000***	H4a Accepted
SC*RM -> CA	0.285	0.289	0.091	2.528	0.012**	H4b Accepted
RC*RM -> CA	0.233	0.236	0.128	1.802	0.072*	H4c Accepted
CA -> PF	0.168	0.163	0.071	2.355	0.019**	H5 Accepted

Note: *, **, *** significance at 10%, 5%, and 1%

RM = risk management, CA = competitive advantage, HC = human capital, SC = structural capital,

RC = relational capital

Source: own

Table 2 shows that risk management positively affects SME's competitive advantage (p-value = 0.024), thus supporting hypothesis 1. Likewise, three-element of intellectual capital significantly affect competitive advantage (p-values = 0.000; 0.003; and 0.040), its mean support hypotheses 3a, 3b, and 3c. The statistical result of moderating test, the interaction between intellectual capital and risk management has a significant effect on competitive advantage (p-value = 0.000, 0.012, and 0.072). These results support hypotheses 4a, 4b, and 4c. These results also indicate that intellectual capital is a moderating and explanatory variable. Thus, the intellectual capital is quasi moderation. This study also examines the mediator variable's role, as shown in Table 3.

Table 3. The result of mediating effects

Relationships	Original Sample	Sample Mean	Standard Deviation	T Statistics	p-Values	Conclusion
RM -> CA	0.128	0.134	0.101	2.274	0.024**	H6 Accepted Complete mediation
RM -> PF	0.076	0.070	0.066	1.160	0.247	
CA -> PF	0.168	0.163	0.071	2.355	0.019**	

Note: *, **, *** significance at 10%, 5%, and 1%

RM = risk management, CA = competitive advantage, PF = performance

Table 3 shows the steps in the mediation test. In the first, the influence of risk management on competitive advantage has a p-value of 0.024. In the second, the influence of risk management on SME performance has a p-value of 0.247. This figure indicates that the statistical test results do not support hypothesis 2. The third stage shows that competitive advantage significantly affects SME's performance (p-value = 0.019); it supports hypothesis 5. The last results indicate a mediation effect in the model. Competitive advantage completely mediates risk management and SME performance relationship. Thus, the results support hypothesis 6.

4. DISCUSSION

The results of the first hypothesis test reveal that risk management has a positive effect on competitive advantage. An effective risk management system provides four benefits for organizations to create a

competitive advantage. The four benefits are maintaining organizational performance, especially when competitors cannot do this, seeking riskier business opportunities, creating advantages, and building a solid reputation that leads to competitive advantage. Risk management is a strategic asset to create SME's competitive advantage. Risk management also directs SMEs to develop unique strategies that make SMEs superior to their competitors. The findings support the previous result that risk management forms a competitive advantage (Armeanu et al., 2017; Yang et al., 2018).

Several empirical findings show that risk management improves organizational performance (Rehman & Anwar, 2019; Saeidi et al., 2021; Soltanizadeh et al., 2016). Nevertheless, statistical results are inconsistent with previous studies, that risk management practices cannot improve SMEs' performance. These results indicate that risk management cannot directly increase SME profits. Nonetheless, risk management helps SME owners to focus on managing the negative risks posed by the Covid-19 pandemic. Proper risk management will help SMEs overcome the threat or minimize the negative impact of the Covid-19 outbreak. Therefore, SMEs maintain employees' creativity and productivity by innovating, creating new products, or expanding market segments. The creativity and productivity of employees ultimately create a competitive advantage that will increase the SME's sales and profits. The findings support previous research (Alawattegama, 2018; Li et al., 2014; Quon et al., 2012) that there is no significant increase in performance over these risk management practices.

The third hypothesis examines the influence of intellectual capital on competitive advantage. The statistical tests confirm that the three elements support the research hypothesis. Intellectual capital includes employee skills, technology, supplier and customer information, and trade secrets as intangible assets. Human capital contributes to developing new ideas with competitive differentiation (Agostini et al., 2017; Kianto et al., 2017). Structural capital encourages employee knowledge collaboration to innovate continuously. Meanwhile, relational capital allows organizations to create innovation with stakeholders (Beltramino et al., 2021). Considering SMEs have limited assets and resources, they must maximize intellectual capital to create competitive advantages.

Regarding the resource-based view, risk management and intellectual capital are fundamental organizational resources. SMEs take advantage of these two strategic assets to create a competitive advantage and improve their performance simultaneously. Consistently, the fourth hypothesis result also reveals that human and structural capital strengthens the influence of risk management on competitive advantage. Nevertheless, relational capital has a less significant role. These results propose that high levels of intellectual capital help an organization manage the risks (or impacts) of unexpected environmental changes competently. A prior study revealed that intellectual capital moderates risk management and SME performance (Girangwa et al., 2019). Saeidi *et al.*'s (2021) research also proves that risk management improves financial performance and increases intellectual capital.

Specifically, the moderation test result represents that relational capital has a lower contribution than human and structural capital. This condition indicates that SMEs must create value through business collaboration, building customer satisfaction and loyalty, and fostering cooperation with suppliers (Ibarra-Cisneros et al., 2020). This capital contributes to SMEs' sustainable performance. This finding supports Xu and Li's (2019) research that human capital and structural capital efficiency influence SMEs' performance, contrary to the efficiency of relational capital.

The fifth hypothesis result state that competitive advantage positively affects SME performance. SMEs create competitive advantage through product differentiation, innovation, superior product value, and market position. Competitive advantage enables organizations to adapt and compete, leading to increased performance. The results support previous evidence that competitive advantage positively affects performance (Anwar, 2018; Bapat & Mazumdar, 2015).

The last result also indicates that competitive advantage is complete mediation between risk management and SME performance. Although risk management cannot affect the company's performance directly, risk management creates competitive advantages that lead to improved performance (Rehman & Anwar, 2019; Soltanizadeh et al., 2016). Therefore, risk management impacts SMEs' performance through competitive advantage.

4.1 Robustness test

This study conducted a robustness test to reduce spurious results. We examine the impact of three control variables: industry type, age, and some assets in the structural model. The results indicate that three variables do not play a significant role. This study categorizes the SME sector. The results found that there was no significant difference between the three sectors. Therefore, this study has a robust result.

CONCLUSION

The Covid-19 pandemic is one business risk that threatens the SME's survival. SMEs must take advantage of the strategic assets of SMEs to accomplish business risks effectively, such as risk management and intellectual capital. This study supports the RBV theory that recognizes the mission of risk management in improving competitive advantage. However, risk management cannot improve the SME's performance directly. This finding indicates the importance of competitive advantage in improving SME performance.

The results have theoretical, practical, and policy implications. Theoretically, these results provide academic support for the development of RBV. This finding confirms the importance of SME competitiveness creation to facilitate risk management towards improving the performance of SMEs. Based on a practical view, the result implies that SME management should strengthen internal capacity through intellectual capital and risk management practices. Management must manage the organization's intangible assets into competitive products. We recommend that SMEs have a formal risk management framework to adapt to a dynamic environment. Based on a policy perspective, the finding reinforces the Indonesian government's initiative to propose SMEs invest in intellectual capital in the digital era. Moreover, the Covid-19 pandemic has accelerated the transformation of the conventional economic system toward knowledge-based. The government should seriously consider formulating SMEs' risk management guidelines and frameworks.

This study has some limitations. First, this research is an initial survey of risk management practices in SMEs during the Covid-19 pandemic. Therefore, the study does not identify the eight components of risk management recommended by COSO. Future studies must evaluate risk management practices referring to COSO recommendations to obtain a comprehensive picture of risk management practices in the SME sector. Second, this study finds that risk management does not directly improve SME performance. Future research can compare other studies in developing countries.

ACKNOWLEDGEMENT

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The Effects of Compound Macroeconomic Variables on Economic Growth, Evidence from North African Countries, using PARDL and the PVAR Approaches

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ARTICLE INFO

ABSTRACT

The empirical economic literature has relied on traditional factors such as capital and labor in explaining the causes of economic growth. However, re-cently, the studies used new economic concepts based on a wide number of factors expressed in compound indicators (such as index of; digitization, com-petitiveness, innovation, Economic Complexity, and Macroeconomic instabil-ity) to investigate their impacts on economic growth. So, the main objective of this study is to examine the effect of Economic Complexity, Economic Free-dom, and Macroeconomic Instability on Economic Growth in the North African region between 1999-2019. The study used the first generation of panel unit root test (IPS, ADF, PP) To identify the individual root in Cross-Section Inde-pendence. The unit root result shows that variables GDPg and ECI are station-ary at level (0) while variables EFI and MII are stationary at level (1). This study employed the PARDL and the PVAR approaches to investigate the linkages between the studied variables. Then, to clarify the direction of the relationship between the variables, we employ the Dumitrescu-Hurlin approach of causal-ity test appropriate for panel data. The fin-dings reveal a significant long-run cointegration relationship among ECI, EFI, MII, and GDPg at the 5% signifi-cance level. Furthermore, the PVAR estimation approaches confirm that; the economic freedom index, macroeconomic instability index, and economic complexity index are significantly and positively associated with GDP growth. The empirical results also proved a critical causality from macroeconomic in-stability to GDP growth and passing across Economic Complexity and Eco-nomic Freedom. In this context, to boost economic growth in North African countries, economic policymakers must work on; Reducing economic insta-bility, increasing levels of economic Complexity, and supporting economic Freedom.

INTRODUCTION

Previously, to explain and determine the reasons for economic growth, models describing economic growth relied on the Cobb Douglas production function concept, which determines how production factors such as capital and labor affect the gross domestic product. Recently, many studies have examined new determinants of economic growth. These studies used new economic concepts expressed in compound indicators (such as economic Complexity, Macroeconomic Stability) to discuss their impact on economic growth. These compound variables are composed of macroeconomic variables that have a mutual effect on the performance of the macroeconomy, which is what called for the search for the impact of such compound variables on economic growth.

The concept of Macroeconomic Stability refers to a situation of the national economy that has to avoid vulnerability to external and internal shocks, which in turn increases its prospects for sustained growth. The macroeconomic stability index consists of five variables: Low and stable inflation, low long-term interest rates, Low national debt relative to GDP, Low deficits prevent growth in the national debt, and Currency stability.

More recently (Hausmann et al., 2007) introduced the role of micro-products produced by the economy in economic growth through economic Complexity. which has attracted the attention of many economists, especially with creating a new Economic Complexity Index (ECI) by Hidalgo. & Hausmann, 2009. Hidalgo and Hausmann (2009) defined "Productive knowledge" as the sum of the complex cooperation between the individuals, institutions, and policies in a society". Productive knowledge is the economy's productive capabilities that share the concept of Economic Complexity.

Another important concept, Economic Freedom, means no barriers to business entry, business operations, and business exit. Also, Economic Freedom through the indirect impact of the creation institutions framework and environment that encourages economic development.

The analysis of the role of economic Freedom, economic Complexity, and macroeconomic stability is of great interest, proved by much research (Dornbusch and Edwards (1990); Onis (1997); Fischer, 1993; De Haan and Siermann, 1998; Hidalgo and Hausmann, 2009), especially in developed countries. Recently, many researchers have been interested in developing countries (Neffati and Sallam (2021); Güneri and Yalta (2020); Buhari et al. (2020); Ibragimov et al. (2019); Ali and Rahman (2015)) .

Especially in North African countries, which witnessed a decline in economic growth rates and high unemployment rates due to the Arab Spring revolutions, economic policymakers look for ways to advance these countries and achieve high growth rates. This paper is interested in ingredients for success to promote the current developments in North African countries. However, it is noteworthy that previous studies examined the impact of these variables individually. So, to take this shortage into account, this study contributes to the economic literature by Investigating The relationship between Economic Complexity, Macroeconomic Stability, and Economic Freedom and their role in promoting Economic Growth.

Achieving high economic growth rates remains a primary goal of economists and politicians. However, with economic growth affected by many individual and compound economic variables, the problem of the study lies in researching and explaining the role of a group of complex variables such as economic Complexity, Economic Freedom, and economic stability on economic growth.

The study will test the following hypotheses:

Hypothesis 1; Economic Complexity, Economic Freedom, and macroeconomic stability in North African countries positively impact economic growth.

Hypothesis 2; There is a causal relationship between the independent study variables.

Hypothesis 3; There is a one-way causal relationship between the independent study variables (economic Complexity, Economic Freedom, and macroeconomic stability) and the dependent variable (economic growth).

So, the main objective of this study is to examine the dynamic relationships between economic Complexity, Economic Freedom, and macroeconomic stability and between economic growth in North African

countries. To achieve the aim of this study, we will use two approaches of empirical analysis: the long and short-run Cointegration relationships and the Pairwise causality approach for the period between 1999-2019.

Besides the introduction, this study is divided into three sections: Section 2 provides a literature review. Section 3 presents the methodology, reports the estimation, and analyses the empirical results. The 4th section concludes.

1. LITERATURE REVIEW

This part aims to survey the empirical literature on the relationship between Macroeconomic instability, Economic Complexity, Economic Freedom, and Economic Growth. In addition, a nexus causality between them will be briefly outlined.

The potential and compound Capabilities are more diverse and multidimensional when compared to traditional factors of production such as labor, capital, and technology. And the ability to explain the differences in growth levels between countries.

After the original contribution by Robert Solow (1956) in economic growth theory, much research in the theoretical and empirical literature investigated the causes of growth in diverse ways. And they have concluded that there are various factors causing differences in growth levels between countries; such as) the stock of human capital (Lucas, 1988), R&D, knowledge, and ideas (Romer, 1986,1990a), government expenditure (Barro, 1990), the quality of institutions (Glaeser et al.,2004), etc...

In the last two decades of economic literature, several studies which sought the reasons for enhancing economic growth abandoned the Investigation of partial variables (e.g., innovation, knowledge, education, etc.). Instead, it headed for the use of global or composite indicators consisting of macroeconomic variables, such as Digitization (Katz and Koutroumpis,2012), economic Complexity (Hidalgo and Hausmann,2009), economic Freedom (De Haan and Siermann,1998), Economic stability (Fischer,1993).

Neffati and Sallam (2021) investigated the relationship between macroeconomic (in)stability and economic growth. First, through how to measure macroeconomic instability. Secondly, determine the determinants of macroeconomic (in)stability and some economic characteristics of North African countries. Finally, the results achieved through econometric analysis refer that trade, investment, and monetary policy are important factors in achieving macroeconomic stability.

Fisher (1993) examined the role of macroeconomic factors in growth by choosing some indicators (inflation rate, public deficit, and black-market exchange rate premium) as an initial attempt to measure the degree of macroeconomic stability in the empirical analysis. And on the same approach, Sanchez (1998) emphasize the role of economic stability in achieving economic growth in the Spanish and Ukraine experience.

By using the dataset from the global competitiveness report, Global Environmental Performance Index, and World Data Bank for 7 European countries (Moldova, Poland, Ukraine, Georgia, Latvia, Belarus, and Lithuania), Ibragimov et al. (2019) reached the same result, emphasized the effect of macroeconomic stability, environmental performance on economic growth.

Dornbusch and Edwards (1990) and Onis (1997) conclude that there is a negative relationship between macroeconomic instability and economic growth, and supporting these findings, Easterly and Kraay (2000), through cross country study, reached that macroeconomic stability and economic growth are positively related to each other. The empirical results of Ali and Rahman (2015) confirm that the availability of a stable macroeconomic environment contributes to achieving the desired level of gross domestic product.

Economic development is the product of accumulating stages of economic Complexity. The Studies presented by Hidalgo et al. (2007) and Hidalgo and Hausmann (2009) explained that economic development is a product of the overall Complexity of a country's productive structure.

By examining the relationship between economic Complexity and growth in the short and long term, Stojkoski and Kocarev (2017) found that economic Complexity Illustrates changes in growth in the long

run. While in the short run, this effect does not appear. And thus, all of this reveals that Economic Complexity requires to develop the long-run strategies in the countries for inventing products and achieving growth rates and sustainable growth.

In this context, Buhari et al. (2020) have shown that economic Complexity and other factors (FDI, institutional quality, trade openness, renewable energy consumption) promote economic growth.

In an attempt to find a relationship between the high-income level and the degree of economic Complexity, Felipe et al. (2014) presented their study, which concluded that there is a close relationship between rich countries (high-income level) and increasing the degree of economic Complexity. Furthermore, this result proved the countries' production structures in varying income levels.

As is known, fluctuations in production affect growth rates, and reducing these fluctuations will positively impact growth. To show the role of economic Complexity as a useful tool in reducing production volatility in developing countries. Güneri and Yalta (2020) used a sample of 61 developing countries between 1981 and 2015. The findings robust that economic Complexity affects output volatility negatively.

Britto et al. (2019) compared South Korea and Brazil, which have similar average per capita GDP levels, to prove the role of economic Complexity in bringing about economic development. Their findings constat that South Korea specialized in products and fields more complex and intensive in technologies. So, it has faster growth rates than Brazil.

To study the enabling environment for economic growth based on the premise that greater economic Freedom leads to higher levels of economic growth, based on Adam Smith's theory of the market's invisible hand. If it is allowed to operate in an environment of Economic Freedom, it will perform an effective task in allocating resources. Therefore, public policy will not be concerned with capital production, technology integration, or the development of a skilled workforce if such an enabling environment is created. Instead, the economy will attract investment and incentivize workers to acquire marketable skills and adopt more advanced technology because this right environment will attract the right inputs. Growth will follow if growth policy focuses on creating an environment of economic Freedom. Without the right environment, growth will not occur.

Economists have resorted to looking for economic Freedom as explanatory variables in countries that are similar in factors of production and have different growth rates. Based on Gwartney et al. (1996), Sturm and De Haan (2001) and, Gwartney et al. (2012), economic Freedom is defined as a personal choice, accompanied by having the right to own property and protection of these rights besides free entry to the market, Freedom of competition. Voluntary activities are carried out in the markets. Gwartney et al. (2010) indicate that economic Freedom has five important components identified by the Fraser Institute. (a) freedom of international trade, (b) regulation of credit, work, and business, (c) access to sound money, (d) size of government, (e) legal structure, and security of property rights .

Akin et al. (2014) conducted their study on five different income categories to investigate the effect of Economic Freedom on economic growth. The study results confirmed a significant and positive relationship between the income group's Economic Freedom and Economic Growth level.

The next part of the paper seeks to achieve this study's aim using a cross-section panel approach.

2. EMPIRICAL STUDY

2.1 Methodologies, Data, and variables Descriptions

The dynamic linkage between Economic Growth, Economic Complexity, Macroeconomic Stability, and Economic Freedom will be analysed based on annual panel data from four North African countries spanning 1999 to 2019. the methodology requires several steps to investigate how economic Complexity, Economic Freedom, and macroeconomic instability are interrelated with economic growth. First, identify short and long-run cointegration relationships between these composite variables. Secondly, using an empirical analysis based on an (ARDL), (VAR), and Granger causality approach, the nature of the observed relationship between economic growth and some of the explanatory variables is detected. The source of data used

is from the World Bank database, Observatory of Economic Complexity, and The Heritage Foundation's Center for International Trade and Economics (CITE).

Economic Complexity Index (ECI)

The original formulation to measure Economic Complexity was created by Hidalgo and Hausmann (2009) from the Massachusetts Institute of Technology (MIT) and Harvard University's Kennedy School of Government. The Economic Complexity Index (ECI) is a composite index, a proxy of the degree of Economic Complexity.

The ECI data is available in The Observatory of Economic Complexity. Hidalgo and Hausmann et al. (2009) propose the concept of ECI as a descriptive measure and predictive tool for economic growth and income inequality. According to the statistics models presented in their Atlas of Economic Complexity. Complexity Economic Index takes the following formula:

$$ECI_c = \frac{K_c - \widetilde{K}_c}{\sigma(K_c)}$$

Where $\widetilde{K}_c$ is the average of K_c and $\sigma(K_c)$ is the standard deviation of K_c(OCE).

Economic Freedom Index (EFI)

We measure economic Freedom based on 12 quantitative and qualitative factors. The Index of Economic Freedom evaluates the extent and effectiveness of government activity in 12 areas that significantly impact economic growth and prosperity levels. The key ingredients of economic Freedom determined by The Heritage Foundation are grouped into four broad categories or pillars of economic Freedom:
  − Rule of Law (property rights, government integrity, judicial effectiveness).
  − Government Size (government spending, tax burden, fiscal health).
  − Regulatory Efficiency (business freedom, labor freedom, monetary Freedom).
  − Open Markets (trade freedom, investment freedom, financial Freedom)

Each of the twelve Economic Freedoms within these categories is graded on a scale of 0 to 100. A country's overall score is derived by averaging these twelve economic freedoms, giving equal weight to each.

Macroeconomic Instability Index (MII)

Most empirical studies used a composite index to measure macroeconomic stability. This study is based on the macroeconomic stability index (MII), developed by Neffati and Sallam (2021). The index takes the following formula:

$$MII_{it} = \sum_{j=1}^{5} w_{ij} \left(\frac{X_{itj} - \min X_{ij}}{\max X_{ij} - \min X_{ij}} \right)$$

The weighted weight w_{ij} It is calculated by using the standard deviation of the variable (j) for all the periods (1999-2019) for each country (i).X_{tij}= the normalized value of each variable in each country in each period.

This paper will apply these composite indexes to determine the impact of economic Complexity, Economic Freedom, and macroeconomic instability on economic growth in four North African countries from 1999 to 2019.

Usually, the Cobb-Douglas function is used in applied studies of economic growth. Still, this study will directly test the relationship between the composite factors (study variables) and economic growth without adding the traditional economic growth variables (capital and labor) in the Cobb-Douglas function. Because the main objective of this paper is to test Cointegration and the causal relationships between economic growth and the new variables adopted. To implement these steps, the empirical model used to test the relationship between economic Complexity, economic Freedom, macroeconomic instability, and economic growth can be specified by a simple model as follow:

$$GDP_g = F\ (ECI, EFI, MII\ )$$

Where GDPg, is the annual rate of economic growth, ECI is the economic Complexity, EFI is the Economic Freedom Index, and MII is the economic stability index. Therefore, there is expected to be a direct relationship between the explanatory variables ECI, EFI, MII, and the dependent variable (GDPg).

2.2 The Panel Unit Root Tests

Many developed tests have recently appeared to analyze the unit root of the panel data and examine it. For example, Pesaran (2003, 2007) develops simple tests of error cross-section dependence applicable to various panel data models. The unit root test literature is related to the correlation between individuals (Cross-Section independence or Cross-Section dependence). The question is whether it is possible to allow the existence of a correlation between the rest of the various individuals in the panel. Two generations of panel unit root tests can be distinguished: The first generation assumes cross-section units are cross-sectionally independent (IPS, ADF and PP.). In comparison, the second generation of panel unit root tests relaxes this assumption allowing for cross-sectional dependence (CIPS and CADF).

Cross-Section Independence Test.

To identify the individual root in Cross-Section Independence, we use the first generation of panel unit root test (IPS, ADF, PP.). Table **1** present the relative result.

Tables 1. Results of the panel unit roots test (Cross-Section Independence Test)

Null: unit root (assumes common unit root process)				
In level	EFI	MII	GDPg	ECI
Im, Pesaran and Shin W-sta	-0.503 (0.308)	0.993 (0.840)	-2.877* (0.002)	-2.927* (0.002)
ADF - Fisher Chi-square	8.269 (0.408)	3.538 (0.896)	24.106* (0.002)	23.075* (0.003)
PP - Fisher Chi-square	11.548 (0.173)	2.887 (0.941)	32.649* (0.000)	11.416* (0.179)
In first difference	ΔEFI	ΔMII		
Im, Pesaran and Shin W-stat	-3.218* (0.001)	-2.218* (0.013)		
ADF - Fisher Chi-square	24.286* (0.002)	17.591* (0.025)		
PP - Fisher Chi-square	63.881* (0.000)	38.187* (0.000)		

Note: * The rejection of null hypothesis at 5%. And (.), P-value.

The unit root result presented in table (1) shows that variables GDPg and ECI are stationary at level (0) while variables EFI and MII are stationary at level (1). Because EFI and MII variables are not stationary in I(0) and are stationary in their first difference, long-term relations between variables are examined with co-integration tests and short-term relations with error correction tests. According to this result, to Investigate the nexus between Economic Complexity, Economic Freedom, Macroeconomic instability, and economic growth in North African Countries, we apply two mothed: Panel Vector autoregressive model (PVAR) and Panel Autoregressive distributed lag (PARDL).

Cross-Section Dependence Test (CIPS and CADF unit root tests)

Preliminary to proceed with the Granger causality analysis, it is necessary to choose a suitable model, referring to the procedure of the stationarity test of variables used (ECI, EFI, MII, and GDPg). The first-generation panel unit root tests are the most often used. Still, they are sensitive to the cross-sectional dependence that emerges from shocks common to countries' groups or spillovers across countries. More-over, the asymptotic convergence to the normal distribution of the first-generation panel unit root tests' estimators assumes that all the panel units are independent, so these first-generation tests are unreliable if there is cross-sectional dependence. To avoid this problem, we use a second-generation panel unit root test developed by Pesaran (2007), based on the Im, Pesaran, and Shin (2003) unit root test.

Further, Pesaran's method (2003) is based on augmenting the usual ADF regression with the lagged cross-sectional mean. And its first difference is to capture the cross-sectional dependence that arises through a single-factor model. Finally, Pesaran (2007) proposes a simple alternative where the standard augmented Dickey-Fuller (ADF) regressions are augmented with the cross-section averages of lagged levels and first differences of the individual series.

According to Pesaran (2007, p283), This is called the Cross-sectionally Augmented Dickey-Fuller test (CADF) to detect the presence of a unit root. We estimate the CADF and CIPS unit root test based on the following equation:

$$\Delta y_{it} = a_i + b_i y_{i,t-1} + c_i \bar{y}_{t-1} + \sum_{j=0}^{p} d_{ij} \Delta \bar{y}_{t-j} + \sum_{j=1}^{p} \delta_{ij} \Delta y_{i,t-j} + \varepsilon_{it}$$

Where $\bar{y}$ The average at time t of all observations, a, b, c, d, δ are parameters, i number of countries, and j number of variables.

After running this CADF regression for each country (i) in the panel, Pesaran averages the t-statistics on the lagged value (called $CADF_i$) to obtain the CIPS statistic. Experimental results show that these tests perform well

$$CIPS = \frac{1}{N} \sum_{i=1}^{N} CADF_i$$

In the case of cross-sectional dependence, traditional unit root and Cointegration tests may produce biased results. Therefore, different tests were used to measure the cross-sectional dependence, CIPS, and CADF unit root tests.

For instance, the cross-sectional dependence (CD) test is helpful in the case of large N and small T in the panel data (Pesaran 2004).

$$CD = \sqrt{\frac{2T}{N(N-1)}} \left(\sum_{i-1}^{N-1} \sum_{J=I+1}^{N} p_{ij} \right)$$

In contrast, the LM test was applied for panel data with large T and small N. Herein, we used Breusch, Pagan LM test, Pesaran CD test, and Pesaran scaled LMtest for reliable results (Breusch and Pagan, 1980). The result provides reinforcing proof to discard the null hypothesis of cross-sectional dependence as the relevant p-value is below 0.01. Avoid obtaining biased results when using traditional unit root tests and co-integration in panel data models. Cross-sectional dependence tests should be performed before starting unit root tests for the variables of this study. So, in this study, we use the Breusch-Pagan LM test, and Pesaran scaled LM test to measure the cross-sectional dependence and reliable results.

Table 2. Results of the panel unit roots test:

a-Cross-Section Dependence Test

Null hypothesis: No cross-section dependence (correlation)		
variables	Breusch-Pagan LM	Pesaran scaled LM
GDPg	9.017 (0.173)	0.871 (0.384)
ECI	82.908* (0.000)	22.202* (0.000)
EFI	13.523* (0.035)	2.172* (0.029)
MII	32.869* (0.000)	7.756* (0.000)

Note: * The rejection of null hypothesis at 5%. And (.), P-value.

b- Cross- Sectionally Dependent Panels

Variables	Country	Constant	Constant with trend
		CADF Unit Root Tests	
GDPg	Algeria	-1.85***	-3.19***
	Egypt	-1.41***	-1.64***
	Morocco	-1.74***	-4.08***
	Tunisia	-5.47	-3.21***
ECI	Algeria	-0.93***	-3.28***
	Egypt	-0.32***	-1.79***
	Morocco	-1.91***	-3.40***
	Tunisia	-0.21***	-3.79***
EFI	Algeria	-1.12***	-4.27***
	Egypt	-3.55***	-2.91***
	Morocco	-0.74***	-5.10
	Tunisia	-4.01	-4.67***
MII	Algeria	-1.59***	-3.55***
	Egypt	-3.03***	-2.02***
	Morocco	-3.88***	-3.43***
	Tunisia	-1.45***	-5.23
Variables		CIPS Unit Root Tests	
GDPg		-2.62	-3.03***
ECI		-0.84***	-3.06***
EFI		-2.36***	-4.24
MII		-2.49***	-3.56

The null hypothesis of CADF and CIPS unit root tests is non-stationarity. At constant, the critical values are −2.6, at 1% (***) significance levels. At trend and constant, the critical values are −3.15 at 1% (***) significance levels

The *tables (2a,2b)* display a cross-sectional relationship between ECI, EFI, MII, and GDPg. We used the Cross-sectional Augmented Dickey-Fuller (CADF) and Cross-sectional of Im, Pesaran, and Shin (CIPS) panel unit root test developed by Pesaran (2003, 2007). CIPS and CADF tests work under the postulation of the cross-sectional dependence.

2.3 Panel Cointegration tests and ARDL estimation

After analyzing the stationarity of studied variables, the next step consists of the determinant of the lag length order to know the right order of the estimated model, as shown in table (2.b). Order 1 is the optimal Lag length. To verify that it is the optimal Lag length, a VAR Residual Serial Correlation LM Test is performed. Finally, we accept the Null hypothesis through the value of probability, which means no auto-correlation.

Table 3. VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
*Endogenous variables: GDPG ECI EFI MII*
*Sample: 1999 2019*
0	-310.8902	NA	0.220650	9.840320	9.975250	9.893476
1	-134.2134	325.7479*	0.001457*	4.819169*	5.493820*	5.084948*
2	-123.2803	18.79135	0.001718	4.977508	6.191880	5.455911
3	-118.3833	7.804617	0.002469	5.324477	7.078569	6.015502

* indicates lag order selected by the criterion

Source: own

VAR Residual Serial Correlation LM Tests

**Null hypothesis: No serial correlation at lags 1 to h

Lag	LRE stat	Prob.
1	17.15450	0.3757
2	32.74987	0.4300
3	41.88495	0.7204

**Here, we accept the Null hypothesis mean that there is no autocorrelation

According to the parsimonious principle, First-period lag is considered the best lag length. The selection of the right lag length based on the Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), and Hannan-Quinn Information Criterion (HQIC), is summarized in table 3.

The lag length value equals (1) main, with no residual autocorrelation. Those conditions permitted us to use cointegration tests.

The extensive interest and the availability of panel data have led to an emphasis on extending various statistical tests to panel data. As a result, recent literature has focused on cointegration tests in a panel setting. There are several testing procedures available for panel cointegration use, such as Kao (1999), Pedroni (1999, 2004), Fisher-type test using an underlying Johansen methodology (Maddala and Wu 1999), and Westerlund (2007). This study uses the first three tests to test the cointegrating relationship between Economic Complexity, Economic Freedom, Macroeconomic instability, and economic growth in North African Countries during 1999-2019.

Table 4. Cointegration Panel Test

Cointegration Panel Test types	types	t-stat	Prob.(p-value)	No. of CE(s)
Fisher	Fisher Stat. (trace test)	54.87	0.0000	None
		26.22	0.0010	At most 1
		16.04	0.0418	At most 2
	Fisher Stat. (max-eigen test)	36.35	0.0000	None
		14.93	0.0604	At most 1
Pedroni	Panel PP- Stat.	-3.546	0.0002	
	Panel ADF- Stat.	-3.803	0.0001	
Kao	ADF	-3.254	0.0006	

Source: own

Table 4 shows the short-run and long-run causal relationships that were also investigated using the panel error correction model.

Table 5. Panel ARDL estimation

Dependent Variable: D(GDPg)		
Method: PARDL (1, 1, 1, 1)		
Long Run Equation		
Variable	Coefficient	Prob.*
ECI	-1.338251**	0.0274
EFI	0.080312***	0.0000
MII	-3.398203***	0.0009
Short Run Equation		
Variable	Coefficient	Prob.*
COINTEQ01	**-0.723546****	**0.0340**
D(ECI)	1.922396	0.5297
D(EFI)	0.035038	0.8014
D(MII)	-3.184606	0.2120

Source: own

The results of the co-integration test presented in table (5) indicate a cointegration relationship in the long term between the variables of the study. But, in the short run, there is no cointegration relationship. This result was confirmed by the value of the error correction coefficient (-0.724), which means that it can return to the equilibrium position again after 1.3 years.

According to the estimation results (table 5), there is a significant long-run relationship among ECI, EFI, MII, and DGPg at the 5% significance level .

The relationship between Economic Freedom and economic growth is positive. This result agrees with *Hypothesis1*. Although the results appear that economic Complexity has a negative relationship with GDP growth rate, it concurs with *Hypothesis 1*. Because the value of the economic complexity index for those countries was negative throughout the study period ,at the same time, macroeconomic instability negatively impacts the GDP growth rate. These findings mean that the increase in macroeconomic instability decreases the GDP growth rate.

2.4 The panel VAR model (PVAR)

Researchers used the PVARs approaches to deal with dynamic models involving heterogeneous units in the empirical literature. To show how structural time variation can be handled and illustrate the challenges to researchers interested in studying cross-unit dynamics interdependences in heterogeneous set-ups. Moreover, Canova and Ciccarelli (2013) prove that the PVARs model is currently at the core of

discussions in academics and the policy area because of some advantages, they can: (i) capture both static and dynamic interdependencies, (ii) treat the links across units in an unrestricted fashion, (iii) easily incorporate time variations in the coefficients and the variance of the shocks, and (iv) account for cross-sectional dynamic heterogeneities. They also argue that the panel VARs can become an essential means to answer relevant economic questions that do not require the specification of the entire economic structure. For all these reasons, we use the panel VAR model, which is written in general form as fellow:

$$Y_{it} = A_{0i}(t) + A_i(l)Y_{t-j} + u_{it} \qquad (1)$$

As our case study is limited to four north African countries, where i=1, 4 (countries) and t= 1999, 2019 (years), the equation (1) can be rewritten for the PVAR model as follow:

$$GDPg_{it} = A_{11}(t) + A_{12}(l)ECI_{t-j} + A_{13}(l)EFI_{t-j} + A_{14}(l)MII_{t-j} + u_{1t} \ (M1)$$

$$ECI_{it} = A_{21}(t) + A_{22}(l)GDPg_{t-j} + A_{23}(l)EFI_{t-j} + A_{24}(l)MII_{t-j} + u_{2t} \ (M2)$$

$$EFI_{it} = A_{31}(t) + A_{32}(l)GDPg_{t-j} + A_{33}(l)ECI_{t-j} + A_{34}(l)MII_{t-j} + u_{3t} \ (M3)$$

$$MII_{it} = A_{41}(t) + A_{42}(l)GDPg_{t-j} + A_{43}(l)ECI_{t-j} + A_{44}(l)EFI_{t-j} + u_{4t} \ (M4)$$

Table 6. PVAR model regression results

Vector Autoregression Estimates, Sample (adjusted): 2000-2019				
	M1	M2	M3	M4
	GDPg	ECI	EFI	MII
GDPg (-1)	0.3347***	-0.008957	0.041200	-0.0150**
	(2.98950)	(-1.39702)	(0.30897)	(-2.38087)
ECI (-1)	-0.193907	0.9859***	0.998178	0.0695**
	(-0.31339)	(27.8254)	(1.35456)	(2.00005)
EFI (-1)	0.034209	0.003983	0.8544***	8.02E-06
	(0.61518)	(1.25062)	(12.9016)	(0.00257)
MII (-1)	0.085357	-0.035332	-0.357413	0.8498***
	(0.09282)	(-0.67096)	(-0.32636)	(16.4540)
C	0.387452	-0.173280	8.3488**	0.158880
	(0.11936)	(-0.93218)	(2.15959)	(0.87148)
R-squared	0.117355	0.923857	0.725643	0.821707
F-statistic	2.492976	227.4978	49.59157	86.41401
Log likelihood	-156.3396	72.46519	-170.3203	74.01898
Akaike AIC	4.033490	-1.686630	4.383007	-1.725475
Mean dependent	3.705894	-0.392190	56.38500	0.413390
S.D. dependent	1.829444	0.356689	3.907963	0.228613
Determinant resid covariance (dof adj.)	0.001313			
Determinant resid covariance	0.001014			
Log-likelihood	-178.3135			
Akaike information criterion	4.957837			
Schwarz criterion	5.553344			
Number of coefficients	20			

Included observations: 80 after adjustments, Standard errors in ( ) & t-statistics in ( )
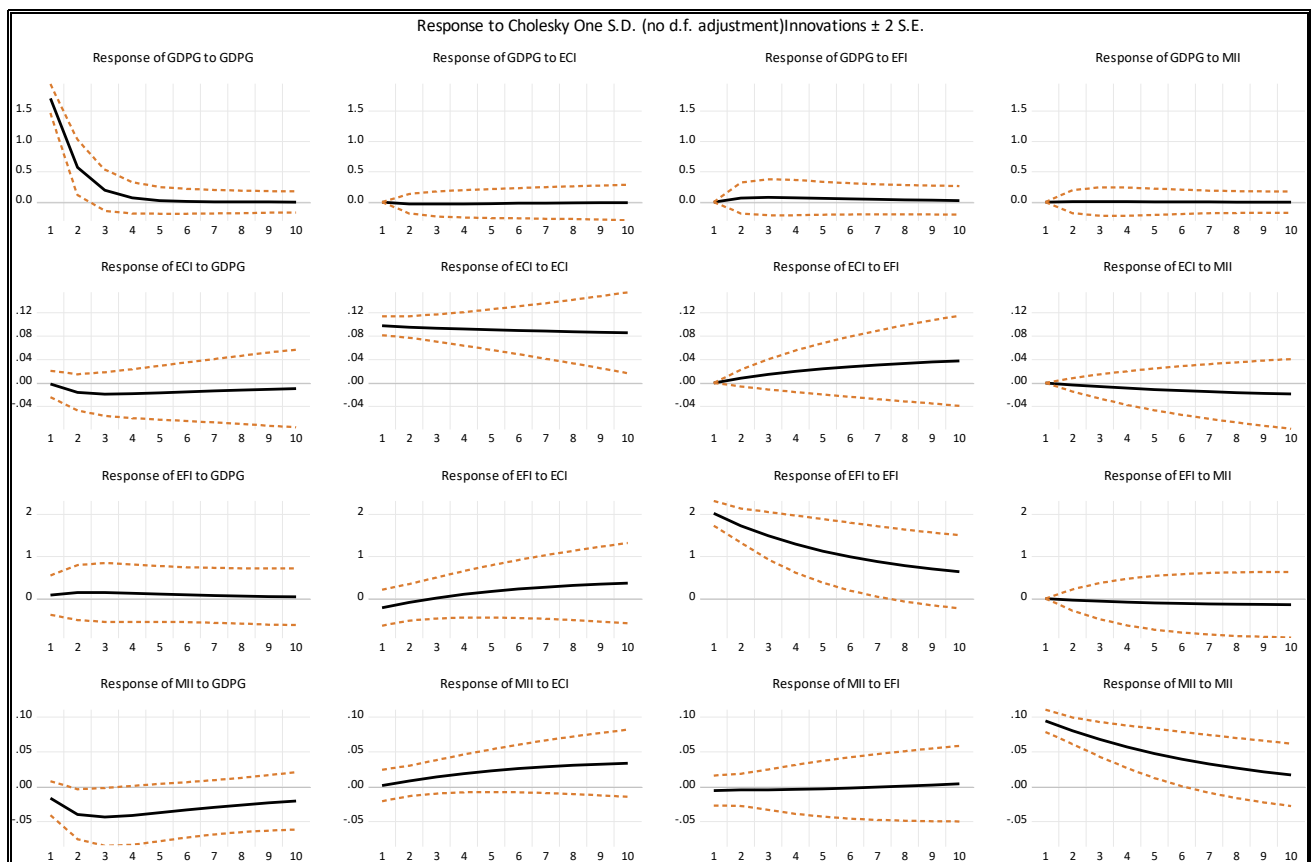
Source: own

Table 6 summarizes the results of the PVAR estimation for the four equations (M1-M2-M3-M4) that show the dynamic relationships between the study variables. Under the significance level (1%), all variables

are positively affected by their levels in the previous periods. This result means that enhancing the values of these variables positively affects their cumulative growth events.

Dynamic relationships appear at the 5% level of significance between these variables. Economic growth significantly and positively impacts achieving more economic stability (M4). Economic Complexity also contributes to achieving high levels of Economic stability (M4). In light of the significance and positive effects of economic growth and Complexity on Economic stability, we find that Economic stability, in turn, has a significant and positive impact on Economic stability (M3). Economic Freedom and Economic Stability create an economic environment conducive to achieving sustainable growth rates, encouraging many institutions for Economic stability.

2.4.1 Impulse Response Function

We used the impulse response function analysis of four variables to analyze the dynamic relationship between variables. This graph illustrates the impact of a standard random perturbation shock on the other variables and can explore the dynamic relationship and interaction between variables.


Figure1. Impulse Response multiple graphs
Source: own

The most important results that can be extracted from Fig. (1) are as follow:

– Row1 presents the responses of GDP growth to the shocks of other variables. The GDPg variable shows a negligible positive response to ECI, EFI, and MII shocks. This result is clearly shown in Figure (2-a) Impulse Response combined graphs, meaning that changes in economic Complexity, Economic Freedom, and economic stability are taking place slowly.

- Row2, which is combined in fig. (2-b), ECI negatively responds to the shocks in GDPg and MII. In contrast, it reacted positively to the EFI shocks. Economic Freedom generally refers to the economy's ability to attract more foreign investment, increasing the degree of Complexity of products and services.
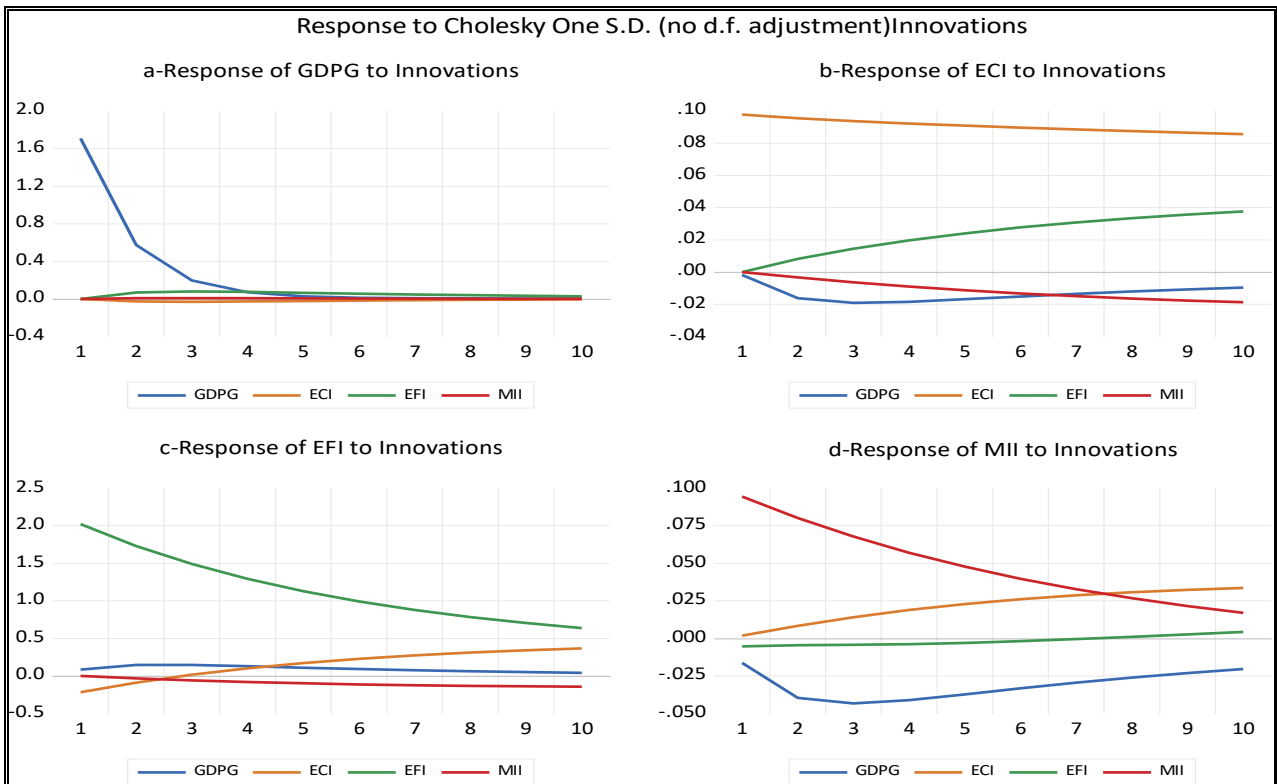
Figure 29. Impulse Response combined graphs (Cholesky One S.D. (d.f. adjusted)

Source: own

Thus, it can be said that economic Freedom has a positive effect on economic Complexity, and at the same time, economic Complexity also positively affects economic Freedom. Therefore, the increase in the degree of economic Complexity of the state encourages the strengthening and consolidation of facilities that produce products that raise the degree of economic Complexity of the country.

The results obtained from the ARDL Panel model in the short term indicate no relationship between the independent variables of the study (ECI, EFI, MII) and the dependent variable (GDPg). This result is consistent with the results derived from the Impulse Response Function (IFRS), which indicates that (GDPg) is not affected by the shocks that occur in (ECI, EFI, MII). Also, this result means that changes related to economic Complexity, Economic Freedom, and economic stability are taking place slowly.

2.4.2 The variance decomposition of variables

The Variance Decomposition results summarized in table 7 and presented in figure 3 confirm the results obtained from the analysis of the Impulse Response Function above. In which:

Variance decomposition of the GDP growth indicates that own shock for the whole period of about 98% of the changes in the GDP, where the economic Freedom contributes approximately 1%, the economic Complexity share nearly 0.1%, and the Macroeconomic Stability shares account for 0.001%.

Variance decomposition of the economic Complexity indicates that own shock for the first period, 99.9% of the changes in the economic Complexity. But at the end of the period, Variance decomposition of the economic Complexity indicates that own shock 81% of the changes in the economic Complexity. In addition, economic Freedom contributes approximately 14%, Macroeconomic Stability shares account for 3.5%, and GDP growth contributes 1.3%.

The analysis of economic freedom variance does not differ from the analysis of variance of Economic Complexity. Variance decomposition of the Economic Freedom indicates that own shock for the first period, 98.7% of the changes in the economic Freedom. But at the end of the period, Variance decomposition of the economic Freedom indicates that own shock 86% of the changes in the economic Freedom, while economic Complexity contributes approximately 12%, the Macroeconomic Stability shares account for 1.7%, and the GDP growth contributed 0.5%.

Variance decomposition of the Macroeconomic Stability indicates that own shock for the first period, 96.7% of the changes in the Macroeconomic Stability. But at the end of the period, Variance decomposition of the economic Complexity indicates that own shock 48% of the changes in the Macroeconomic Stability, while economic Complexity contributed approximately 30%, the GDP growth contributed 19%, and the Macroeconomic Stability shares account for 2.5%.

Table 7. The variance decomposition of variables results

Variance Decomposition of GDPg:				
Period	S.E.	GDPg	ECI	EFI	MII
1	1.763985	100.0000	0.000000	0.000000	0.000000
5	1.880273	99.27872	0.082245	0.631436	0.007597
10	1.883045	98.99532	0.100922	0.894616	0.009138
15	1.883564	98.94134	0.101304	0.948175	0.009181
20	1.883724	98.92461	0.103460	0.962458	0.009474
Variance Decomposition of ECI:				
Period	S.E.	GDPg	ECI	EFI	MII
1	0.101015	0.033204	99.96680	0.000000	0.000000
5	0.223909	2.665723	94.13357	2.652584	0.548123
10	0.314974	2.167424	88.82563	7.300363	1.706584
15	0.384537	1.638608	84.49591	11.12870	2.736779
20	0.441684	1.296613	81.27463	13.91145	3.517305
Variance Decomposition of EFI:				
Period	S.E.	GDPg	ECI	EFI	MII
1	2.100833	0.167429	1.135015	98.69756	0.000000
5	3.640842	0.629234	0.758304	98.44128	0.171183
10	4.167075	0.615876	3.499077	95.23230	0.652743
15	4.445055	0.554855	7.668503	90.58260	1.194038
20	4.657893	0.505811	11.81053	86.00913	1.674531
Variance Decomposition of MII:				
Period	S.E.	GDPg	ECI	EFI	MII
1	0.099072	2.908472	0.033794	0.314780	96.74295
5	0.189012	20.28887	3.438842	0.275059	75.99723
10	0.221192	22.69772	12.58348	0.265350	64.45345
15	0.240088	21.24010	22.47560	0.946693	55.33760
20	0.257479	18.98556	30.36074	2.464827	48.18887
Cholesky Ordering: GDPg ECI EFI MII				

Source. own
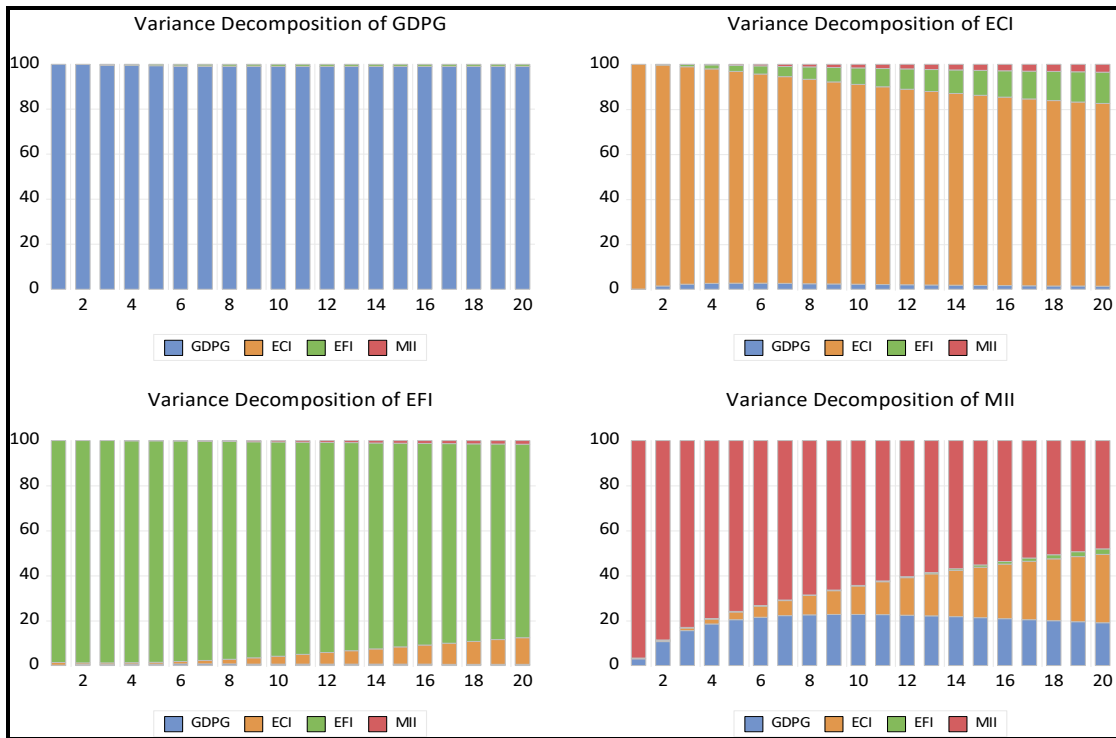
Figure 3. Variance decomposition of variables, tacked graphs using Cholesky (d.f. adjusted) Factors

Source: own

2.5 Panel Causality Tests

a. Pairwise Dumitrescu Hurlin Panel Causality Tests

In a seminal paper, Granger (1969) developed a methodology for analyzing the causal relationships between time series. Dumitrescu and Hurlin (2012) provide an extended test to detect causality in panel data. Consider, in our case, GDPg and X as stationary variables noted t periods and N individuals. For each individual i and each period t. the underlying regression writes as follows:

$$GDPg_{it} = \alpha_i + \sum_{k=1}^{k} \beta_k GDPg_{it-k} + \sum_{k=1}^{k} \gamma_k X_{it-k}' + \varepsilon_{it}$$

$$X_{it}' = \theta_t + \sum_{k=1}^{k} \delta_k X_{it-k}' + \sum_{k=1}^{k} \rho_k GDPg_{it-k} + \mu_{it}$$

Where, X_{it}', replace $ECI_{it}, EFI_{it}, MII_{it}$, and i=country, t=year

Table 8. Pairwise Dumitrescu Hurlin Panel Causality Tests

Dependent variable:	MII		ECI		EFI		GDPg	
Excluded	Chi-sq	Prob.	Chi-sq	Prob.	Chi-sq	Prob.	Chi-sq	Prob.
MII	--		4.9142***	0,0000	0.5676	0.5703	0.67997	0.4965
ECI	-0.7484	0.4542	--		5.1757***	0.0000	0.61618	0.5378
EFI	0.8340	0.4043	-0.1620	0.8713	--		3.0348***	0.0024
GDPg	0.7420	0.4581	1.5586	0.1191	-0.7161	0.4740	--	

Note: ∗∗∗ indicates significance at 1%.

Source: own

According to the Pairwise Dumitrescu Hurlin Panel Causality Tests in table 8, there are intertwined and successive causal relationships that would lead to economic growth. First, macroeconomic stability is a one-way causal relationship to economic Complexity. This relationship moves from economic Complexity to economic Freedom, and finally, economic Freedom to economic growth.

Last, it can be said that macroeconomic stability doesn't emerge immediately, but it indirectly affects economic growth through Economic Complexity and Economic Freedom.

b. Pairwise Granger Causality Tests

Table 9. Pairwise Granger Causality Tests

⇨	MII		ECI		EFI		GDPg	
	F-stat.,	Prob.	F-stat.,	Prob.	F-stat.,	Prob.	F-stat.,	Prob.
MII	--		0.10070	0.7519	0.01780	0.8942	0.01139	0.9153
ECI	4.06143	0.0474**	--		1.72056	0.1935	0.01374	0.9070
EFI	0.16035	0.6899	1.27415	0.2625	--		0.31866	0.5741
GDPg	5.42928	0.0224**	1.46453	0.2299	0.09975	0.7530	--	

Note: - (**) indicate significance at 5%.

- Null Hypothesis: does not Granger Cause

Source: own

The results of the Granger causality test, summarized in table 9, confirm the previous result of the Dumitrescu Hurlin test, as there is a direct effect from economic Complexity to macroeconomic stability as well as from macroeconomic stability to economic growth. Also, according to the Granger Causality test Among Macroeconomic instability, Economic Complexity, Economic Freedom, on Economic Growth.

Therefore, the decline in levels of Macroeconomic stability in North African countries had a negative impact on both economic Complexity, Economic Freedom, and economic growth.

CONCLUSION

This paper estimates the impact of Causality Among Macroeconomic instability, Economic Complexity, and Economic Freedom on Economic Growth in four north African countries using the appropriate panel data approach spanning 1999-2019.

We empirically study the cointegration relationship, the causal effect, and the long run. This study employed Empirical approaches based on the following tests: first, we employ the Breusch-Pagan LM test and cross-sectional augmented Im-Pesaran-Shin (CIPS) panel unit root tests for stationary. Second, we use Dumitrescu–Hurlin panel causality tests for the causality approach. Finally, we used the ARDL panel and the panel VAR approaches to estimate the Dynamic linkages between the studied variables.

The results obtained from the ARDL Panel model in the short term indicate no relationship between the independent variables of the study (ECI, EFI, MII) and the dependent variable (GDPg). This result is consistent with the results derived from the Impulse Response Fonction (IFRS), which indicates that (GDPg) is not affected by the shocks that occur in (ECI, EFI, MII). Also, this result means that changes related to economic Complexity, Economic Freedom, and economic stability are taking place slowly.

This study also applies the second-generation cross-sectional augmented Dickey-Fuller, cross-sectional Im, Pesaran, Shin panel (CIPS) unit root test, and the latest (Westerlund 2007) cointegration tests. In addition, the direction of short-run and long-run causal relationships was also investigated using the PVAR model. Analyzing the results that were reached through the panel Granger causal test (Dumitrescu Hurlin, 2012) and the impulse response functions (in the PVAR approach) confirmed the existence of a reciprocal influence relationship on the one hand. On the other hand, there is a reciprocal response to shocks between economic Freedom and economic Complexity and between economic Complexity and macroeconomic stability, finally achieving economic growth.

Thus, policymakers should design economic growth policies that complement measures of Economic Freedom with more macroeconomic stability and accumulated economic Complexity to enhance economic growth in North African countries. Our results indicate that the positive impact of Economic Freedom on economic growth is magnified when a country's economic Complexity and macroeconomic stability and expressing their political Freedom, political stability, and economic Complexity.

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Improving the Expert and Analytical Activities of the External State Audit Bodies: The Case of Foreign Experience in the Sphere of Tourism

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ARTICLE INFO

ABSTRACT

To ensure the efficient use of public funds and national resources, it is necessary to develop and improve the expert and analytical activities of external state audit bodies.Improving the financial management and fiscal responsibility of countries is particularly facilitated by increased transparency and accountability in the management of public finances. In order to strengthen the budget process, it is necessary to strengthen the state financial control and audit.In this context, the expert and analytical activities of external state audit bodies are of particular importance and require detailed consideration. It should be noted that in the scientific literature of Kazakhstan, the expert and analytical activities of external state audit bodies have not been sufficiently studied.It is also worth considering the practical aspect of using expert-analytical procedures when conducting a state audit. In addition, it is worth paying attention to foreign experience in conducting expert and analytical work using mathematical models, risk analysis.This paper discusses the practical aspect of the use of expert-analytical procedures in the conduct of state audit, as well as foreign experience in conducting expert-analytical work using mathematical models, risk analysis.The result of the study was the development of recommendations for improving the expert and analytical activities of external state audit bodies, taking into account foreign experience

INTRODUCTION

The Institute of State Audit of Kazakhstan arose not so long ago, its formation was presented with the signing of the Laws dated on the 12th of November 2015 "On State Audit and Financial Control" and "On Amendments and Additions to Some Legislative Acts on Issues of State Audit and Financial Control". These laws were developed in order to implement the Concept for the implementation of state audit, taking into account international standards.

According to the Law "On State Audit and Financial Control", depending on the subject, state audit is divided into external and internal, and is also divided into types such as performance audit, financial reporting audit and compliance audit. In general, the focus of public audit is shifted to performance audit, which means the assessment and analysis of the activities of the audited object in terms of efficiency, effectiveness, productivity and economy.

The state audit aims to improve the efficiency of management, as well as the use of budgetary funds, assets of the state and quasi-public sector entities, which include state enterprises, joint-stock companies, limited liability partnerships, national holdings and companies, as well as, in accordance with the legislative acts of the Republic of Kazakhstan, their subsidiaries, dependent and other legal entities affiliated with them, the participant, founder or shareholder of which is represented by the state.

1. LITERATURE REVIEW

Monitoring the efficiency of the use of budgetary funds includes monitoring the targeted use of budgetary funds and analyzing the effectiveness of the use of allocated funds. S. Rahayu et al. (2020) argue that the cumulative socio-economic impact of national programs achieved through structural changes in the economy can be used as a measure of performance, and at the same time, government spending can considered as long-term investments. Government efficiency is influenced by economic development and the growth of new companies and new jobs (Ruzzene, 2016), GDP, poverty and economic independence, can be measured in various ways Kitrar and Lipkind,, 2021). Alternatively, results-based approaches such as value for money or efficiency, performance, economic and financial performance can also be used (Basri & Nabiha, 2014; Sutopo et al., 2017).

During the planning process, the auditor selects a result-oriented approach, problem or system, or a combination of both, to enhance the rationale of the audit plan. However, auditors need to focus on entities with high environmental, social, economic or political influence and visibility to identify areas, processes or systems that need improvement. V.A. Vuymo (2017) studies foreign experience of performance reviews and explains that currently in economically developed countries different terms are used in relation to the definition of performance reviews:

- In the UK and Canada, the term "value for money audit" is used;
- In Sweden and Norway "Performance audit" or "Management audit" (effectiveness audit);
- In the United States - "operational audit" (operational audit).

Analyzing the content of these terms, we can conclude that there are practically no significant differences between them, since they characterize the processes of control over the activities of state bodies. Compliance with the principle of responsibility for the effectiveness of meeting the needs of state and local authorities, as the goal of monitoring and auditing tenders, was considered by I.V. Iolanta (2018), who argues that these innovations occur as a result of the country's integration into the common European economic space, and as a result, there is a gradual convergence of legal norms in priority areas of life of the parties and relevant branches of law, among which the first place is given to corporate and entrepreneurial activity. Audit of the effectiveness of the use of public funds as a modern form of financial management that allows you to assess the feasibility and rationality of the use of budgetary funds (Sutopo et al., 2017). Evaluation of the effectiveness of the activities of state bodies within the framework of strategic management by Kapoguzova E.A., Suleimenova G.K. (2017). She analyzed the process of institutionalization of the system for evaluating the activities of state bodies, but it is not completed, but still gives its results. The performance evaluation system of the entire state contributes to the improvement of internal processes, organizational development and performance improvement. However, in the future it is

necessary to build a system of external assessment of the activities of state institutions by society and increase the transparency of the assessment results.

In recent decades, tourism has grown strongly and the need for efficient and reliable tourism services has increased, and performance auditing has played a key role. However, the issue of performance management in tourism and its role in improving the efficiency of tourism is practically not taken into account. The study emphasizes the importance of performance auditing in tourism and its management (Barisic & Vukovic, 2014). For example, as an environmental management tool, ecotourism environmental audit plays an important role in the implementation of sustainable tourism development. However, an environmental audit of ecotourism cannot be formed overnight. In this long process, we need to work hard to improve it (Jiang, 2021).

The results suggest that engagements affected by the restrictions resulted in lower audit quality, as measured by recalculations and discretionary accruals, compared to those completed prior to the COVID-19 travel restrictions/orders. stay at home. Further analysis shows that this decline in audit quality was associated with firms with high inventories relative to assets, high R&D spending relative to assets, and non-Big Four auditors (Gong, et al. 2022).

2. RESEARCH BACKGROUND AND METHODOLOGY

External state audit in Kazakhstan is represented by the Accounts Committee for Control over the Execution of the Republican Budget and audit commissions that analyze, evaluate the effectiveness of budget planning and execution, budget management and use, state assets (with the exception of assets of the National Fund of the Republic of Kazakhstan and the National Bank of the Republic of Kazakhstan) and industry entities.

Within the framework of the state audit, expert and analytical activities are envisaged.

The expert and analytical activities of the authorized bodies of external state audit and financial control of the Republic of Kazakhstan are carried out in the form of expert and analytical activities, as well as preliminary, current and subsequent budget estimates.

Table 1. The amount of state assignments JSC "NC "KazakhTourism"

Indicator	2017	2018	2019	2020	2021
The amount of state assignments JSC „NC „KazakhTourism"	162 mln. Tenge	1,8 billion tenge	2,8 billion tenge	1,5billion tenge	1,2billion tenge

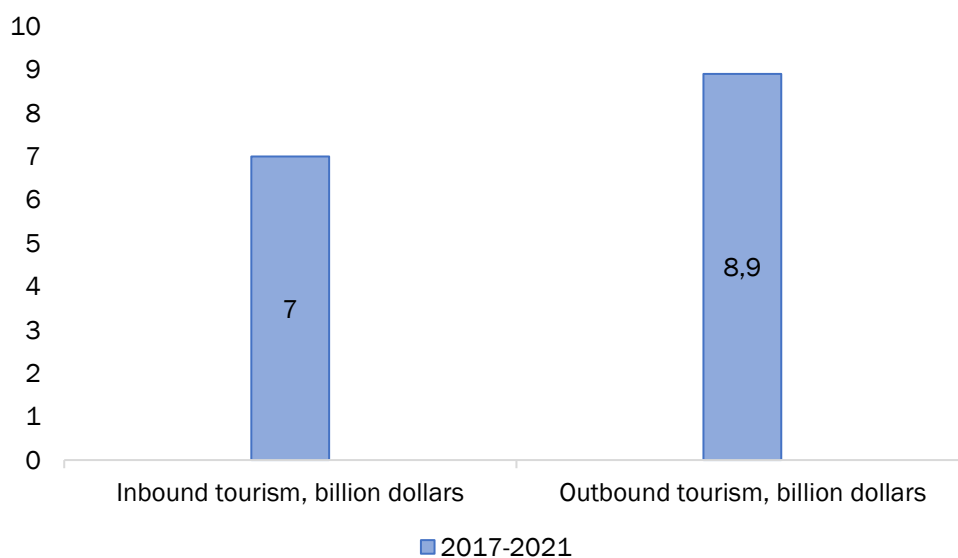Source: compiled by the authors according to data https://stat.gov.kz/

An analysis of all receipts in JSC "NC "KazakhTourism" shows that funding in the form of government assignments mainly prevails in Figure 1.
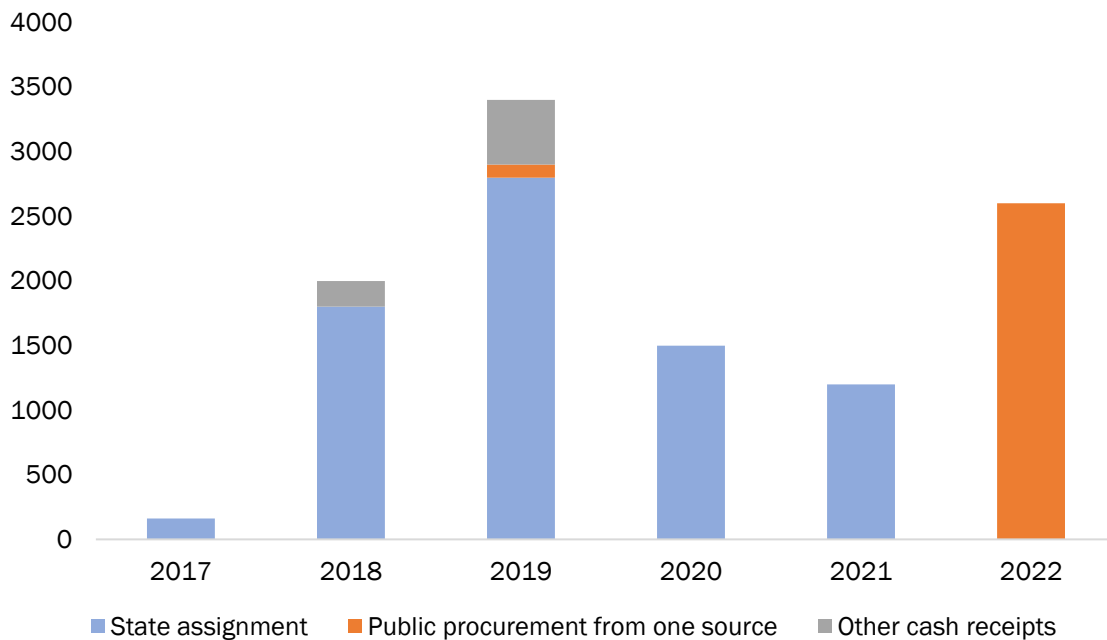
Figure 1. State assignments from the total number of receipts in JSC "NC "KazakhTourism"

Source: compiled by the authors according to data https://stat.gov.kz/

According to the audit for the period of activity of JSC NC KazakhTourism from 2017 to 2021, there was a negative balance of the tourism industry in the amount of 1.9 billion US dollars, this indicator indicates significant errors in the implementation of the tourism potential of Kazakhstan. Income from inbound tourism amounted to 7 billion dollars, a loss due to outbound tourism amounted to 8.9 billion dollars in Figure 2.

Figure 2. The structure of income and losses of the tourism industry of the Republic of Kazakhstan, for 2017-2021

Source: compiled by the authors according to data https://stat.gov.kz/

According to JSC NC KazakhTourism, excluding the "pandemic" year of 2020, the loss due to outbound tourists amounted to 8.9 billion US dollars, income from inbound tourism – 7 billion US dollars.

Strategic guidelines in this area are also significantly overestimated. Thus, in the draft Concept for the development of the tourism industry until 2026, the target markets are countries, the probability of arrival of tourists from most of which is unlikely (the countries of the Middle East and South-East Asia, as well as India, China, Iran).

The imperfection of the methodology for accounting for the number of tourists exacerbates the situation, distorting statistical data and preventing a reliable assessment of the contribution of tourism to the economy. This, in turn, is reflected in the adoption of poor-quality strategic decisions on the further development of this industry (Anreev, 2016; Perovic et al., 2021; Vasanicova et al., 2021; Debruyn and Meyer, 2022).

Financing of activities for the formation of the national product is carried out through JSC "NC "KazakhTourism". On average, 30% of all funds allocated to the national company fall on its maintenance, including the expenses of project teams (wages, travel expenses, rent of premises, communication services). For individual events related to the holding of foreign roadshows and conferences, the share of expenses of project teams is about 50% of the budget of the entire event.

3. RESULTS

At the same time, approaches to calculating the need for funds aimed at remuneration of project teams have not been unified. Also, there is no dependence of payment for the services of JSC NC Kazakh-Tourism as an operator on the number of applications and subsidies paid to subsidize air travel for under-age passengers (KidsGoFree), while up to 85% of the costs are for labor costs. As a result, in the absence of approved amounts for subsidizing air travel in 2023, operator services are unreasonably provided for the provision of the subsidies themselves.

The mechanism for subsidizing children's air travel has not been sufficiently developed, which leads to the lack of demand for the program on the part of tour operators. With a plan for 2022 of 24 thousand applications from tour operators for a total of 357.8 million tenge, as of 2nd of September 2022, 380 applications in the amount of 40 million tenge (or 11%) were paid.

Annual duplication of the same events (analysis of tourism potential), as well as events with low (doubtful) efficiency (roadshows), the direct impact of which on the development of tourism potential is not traced, was noted.

Table 2. Results of the audit of JSC "NC "KazakhTourism"

№	Identified violations	Recommendations after the audit
1	During the period of activity of JSC "NC "Kazakh-Tourism" from 2017 to 2021, there was a negative balance in the tourism industry	Conduct an analysis of the degree of influence of JSC "NC "KazakhTourism" on the development of the tourism industry
2	On average, 30% of all funds directed to Kazakh-Tourism NC JSC fall on its maintenance, including the costs of project teams (wages, travel expenses, rental of premises, communication services). For individual events related to the holding of foreign roadshows and conferences, the share of expenses of project teams is about 50% of the budget of the entire event	Revise the financing mechanism of JSC "NC" Kazakh-Tourism "in terms of optimizing administrative costs and payment for the services of project teams
3	Annual duplication of the same events (analysis of tourism potential), as well as events with low (doubtful) effectiveness (roadshow), the direct impact of which on the development of tourism potential cannot be traced	Reduce 737.7 million tenge for duplicate activities and activities with questionable effectiveness

4	Imperfection of the methodology for accounting for the number of tourists. Lack of reliable assessment of the contribution of tourism to the economy. Making poor-quality strategic decisions on the further development of the tourism industry	Reallocate 462.2 million tenge to other programs of the Ministry of Culture and Sports as inappropriate for the direction of spending on the formation of a national tourism product (administration of subsidies for KidsGoFree, analysis of tourism potential, development of the Online Academy)

Source: compiled by the authors according to data https://stat.gov.kz/

Using the example of the North Kazakhstan region, let's consider the potential of the tourism industry in Kazakhstan.

Currently, the North Kazakhstan region has a real opportunity to present a competitive tourist product on the domestic market Kazakhstan. There is a good potential for this: an organic combination of natural and cultural and historical components in local tourist routes, the use of national color, attractive for sightseeing of newly built socio-cultural facilities. The use of tourism potential in combination with the development of related industries (transport and communication infrastructure, service, culture, construction, insurance and others), stimulating investment activity, will ensure stable employment growth, increase the revenue side of the regional budget.

The following tour operators are available in the city of Petropavlovsk:

LLP Petrotur;
LLP TF Tourist;
LLP "Come with us";
LLP Kazakhstan-Reisen;
LLP Global Tur;
LLP Tengri Tour.

In the course of the study, an analysis of the activities of the studied tour operators of Petropavlovsk was carried out, the results of which are presented in Table 3.

Table 3. Comparative analysis of tour operators of the city of Petropavlovskк

Tour operators of Petropavlovsk	Domestic tourism destinations	Outbound tourism destinations
Petrotour	Sightseeing tours of Petropavlovsk	Turkey, Egypt, Thailand, UAE, Spain, Greece, Canary Islands, Cuba, Dominican Republic. Maldives, Hainan Island. India.
TF Tourist Come with us	Excursions and tours in Petropavlovsk, North Kazakhstan region, Astana, Akmola region: Sandyktau, Imantau, Ayyrtau and Zerenda. Sightseeing tours of Petropavlovsk and Astana	- Thailand, Malaysia. Europe, UAE, Maldives. Dominicana - UAE, China, Turkey. Europe, Egypt, Thailand, Israel. Karlovy Vary, Russia
Kazakhstan-Reisen	-	USA, Canada
Global Tur	Kazakhstan	Turkey, Egypt, Thailand, UAE, Spain, Greece, Canary Islands, Cuba, Dominican Republic, Maldives
Tengri Tour	Group tours to Astana, excursions to Petropavlovsk	Turkey, Greece, Spain, Italy, France, UAE, Thailand, India (Goa), China (o. Hainan), Vietnam

Source: compiled by the authors according to data https://stat.gov.kz/

Analyzing the data on the city of Petropavlovsk, it is clear that not all firms are involved in domestic tourism, this is a problematic point that needs to be paid attention to. And it is also an opening opportunity, in conditions of restrictions in outbound tourism.

Also in the course of the study, an analysis of the tour operator activity of the city of Petropavlovsk was carried out (Table 4).

Table 4. A study of the tour operator activity of the city of Petropavlovsk

Criteria	Petrotour	Tengri Tour	Come with us	Kazakhstan-Reisen	TF Tourist	Global Tour
Number of clients served per month	10-20	10-20	20-30	10-20	10-20	10-20
The amount spent on the developed tours	From 2000$	From 1000$	More than 4000$	From 3000$	From 1000$	От 1000$
Booking programs	Amadeus	Amadeus	Cabriel, Amadeus, Abacus	Amadeus	Amadeus	Cabriel, Amadeus, Abacus
Directions of the company	Turkey, Egypt, Thailand	Turkey, Egypt, Thailand	Turkey, Egypt, Thailand	USA, Canada	Turkey, Egypt, Thailand	Turkey, Egypt, Thailand, UAE, Spain, Greece, Canary Islands, Cuba, Dominican Republic, Maldives
Airline services	Air Astana	Air Astana, SCAT	AirAstana, AircompanyMEGA, SCAT	Air Astana	Air Astana	Air Astana, Aircompany MEGA, SCAT

Source: compiled by the authors according to data https://stat.gov.kz/

According to the results of the analysis, it follows that the tour operators of the city of Petropavlovsk serve the total number of customers per month from 10-20 people, the average amount spent on tours is $ 1000 and above. The leading booking program is Amadeus. Tour operators work in all directions: Turkey, Egypt, Thailand and other countries. The airline Air Astana and SCAT are more popular. Also, tour operators prefer to work with different hotels, and with hotels of the same network with individual hotels.

The North Kazakhstan region has a huge natural potential for the development of various tourism. A large number of travel agencies and tour operators work in the city and in the region, but outbound tourism is a priority in their activities. Today, most residents of the North Kazakhstan region prefer to rest outside of it. But based on the fact that foreign tourism may be closed due to restrictions, it is now necessary to offer and develop intraregional tourism.

A large number of investments are needed for the development of intraregional tourism. Although there are quite a lot of different medical sanatoriums and boarding houses in the region, this cannot be an indicator. For the full development of the regional tourism market, it is necessary to improve the conditions and legislative framework (Böhm, et al. 2013; Akbulaev and Salihova, 2020).

General problems of tourism industry development in the region:

- insufficient development of tourist and transport infrastructure (poor condition of highways to valuable and attractive sightseeing sites and picturesque landscapes, as a result of which many objects of the region are inaccessible for domestic mass multi-day tourism) (Fadeikina et al., 2012; Grabara et al., 2019);
- the material base of accommodation facilities, including hotels, boarding houses, houses and recreation centers, as well as sanatorium-resort institutions, is characterized by underdevelopment of the material and technical base, high cost, low quality of tourist products and services at tourist facilities (Skobara, et al., 2018; Vasanicova et al. 2020):

- low level of service in tourist recreation areas, due to a shortage of personnel in the service sector of tourism;
- shortage of qualified personnel in the service sector of the tourism industry (lack of guides, guides, instructors in the types of tourism who speak the state language);
- insufficient quantity and quality of service of roadside infrastructure facilities (Terekhov & Terekhov, 2019).

The modern tourism industry is one of the largest highly profitable and dynamically developing segments of international trade in services. Tourism generates about 10% of the world's total product, 30% of world exports of services, 7% of world investments, 10% of jobs and 5% of all tax revenues. Taking into account the rapid and continuous growth of tourism, which has been going on for the last ten years, as well as its significant impact on the economy and theThe standing of the community, developed and developing countries define the tourism industry as one of the economically priority.

According to the data of the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan, the main indicators of tourist activity for January-September 2021 fell compared to the same period in 2018:

- by the outbound type of tourism by 70%
- by the inbound type of tourism by 86%
- by domestic type of tourism by 16% (Table 5).

Restrictions on the movement of foreign tourists associated with the Covid-19 pandemic have certainly had a negative impact on the incoming tourist flow Kazakhstan, but at the same time made it possible to reorient the outgoing tourist flow to domestic tourism, as well as to conduct an analysis of the activities of the industry, identify gaps in the effectiveness of tourism activities and direct the efforts of state regulatory authorities and private investors to solve the most acute problems and determine further priorities for the development of the tourism industry Kazakhstan.

Table 5. The main indicators of tourist activity

Period	Number of visitors served by type of tourism, thousand people		
	Outbound	Inbound	Internal
January-September 2018	8233,6	6808,0	4623,3
January-September 2019	8 222,5	6 440,6	5074,4
January-September 2020	2397,6	1 783,6	3 058,7
January-September 2021	2515,2	949,4	3 882,9

Source: compiled by the authors according to data https://stat.gov.kz/

According to the data, it is clear that the outbound and inbound type of tourism suffered the most.The tourism industry is an important source of formation of the revenue part of the budget of the republic, it is necessary to make every effort to return at least to the pre-pandemic indicators.

CONCLUSION

The analysis of the current situation shows that there is no integral system of tourism development in Kazakhstan. The development of Kazakhstan's domestic tourism is hindered by a number of negative factors, which leads to the orientation of the population to outbound tourism. Kazakhstan will now have prospects for the development of domestic tourism, but only when solving a complex of not only tourist-oriented, but also socio-economic problems of the population.

In general, the development of the tourism industry contributes to strengthening interstate ties and culture, increasing the inflow of foreign currency, increasing the balance of payments, stimulating exports

of goods and services, increasing employment, construction and reconstruction of infrastructure facilities, as well as accelerating the diversification of economic sectors.

Tourism, which has become a priority sector of the national economy, ensures sustainable growth of national income and employment, has a stimulating effect on a number of relevant sectors, and significantly increases the inflow of foreign capital and investment in the state and the national economy (Omarova et al., 2021).

Innovations in tourism make it possible to solve a number of problems related to both increasing the level of satisfaction of the cultural needs of the population and creating conditions for the development of innovative forms of small business and the involvement of young people in innovative activities, where digital skills are one of the critical factors of competitiveness, including in the tourism industry, which includes all forms of service infrastructure, capable of meeting the demand of society for recreation and entertainment (Dulatbekov, 2021).

In 2019, the share of tourism in Kazakhstan's GDP was 5.6%, while by 2025 it is planned to increase the figure to 8%. As a result, about 200 thousand will be created in Kazakhstan. new jobs, including 72 thousand. permanent, and the net profit from tourism activities for all interested parties — the state, business and employees — will increase to 200 billion tenge per year (at the moment, the profitability is about 118 billion tenge).

Tourism has an important socio-economic importance, since:

- increases income;
- creates new jobs;
- develops all sectors related to the production of tourist services;
- develops social and industrial infrastructure in tourist centers;
- activates the activities of the centers of folk crafts and the development of culture;
- provides an increase in the standard of living of the local population;
- increases foreign exchange earnings (Stepashin, et al. 2004).

The economic impact of tourism on the country's economy is manifested through indicators of cash flows sent from country to country, which are generated by tourist exports and import. Most of the income from the export of tourist services comes from arriving foreign tourists, as well as from the sale of tickets for domestic transport and other services in the host country. The country's tourist imports are the money spent by its citizens during foreign trips, the payment of transportation costs and other services in the host countries, as well as the payment of dividends to foreign investors in the tourism industry. The difference between the country's income from the export of tourist services and the cost of importing tourist services represents the tourist balance of payments, which can be negative (deficit) and positive.

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Economic Efficiency and Priorities of Public Administration Regulation: The Case of Kazakhstan

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ARTICLE INFO

ABSTRACT

The study of issues of increasing the efficiency and improving the management activities of rural and local self-government seems to be a fairly relevant topic, the study of which will allow us to draw a number of conclusions and generalizations that are important for the further development of the institution of local self-government. The formation of an effectively functioning system of local self-government in the country requires solving the problem of forming a sufficient financial and economic basis for solving local issues. The purpose of the study is to analyze the economic efficiency and priorities of the regulation of public administration on the materials of the Republic of Kazakhstan, including the Karaganda region. A properly formed and well-regulated system of local self-government can have a significant impact not only on issues of local importance, but in the long term it can affect the socio-economic development of the region and even the state, which confirms the analysis of the study conducted by the authors.

INTRODUCTION

Local self-government is an important part of communication between the state and its citizens. Many important government functions are performed at this level. For example, there is the provision of public goods and services. Day-to-day matters are also regulated at the local government level and therefore remain important to citizens. The well-being of households, the well-being and safety of streets and neighborhoods, and, ultimately, urban space, to a large extent depend on the quality of work of local authorities (Skica and Rodzinka, 2021). Some researchers even believe that communication between citizens and authorities at the local level contributes to the development of democracy in the state (Kutsenko, 2020).

The formation of local self-government is a dynamic process that goes through several stages associated with the formation and development of civil society, the general level of socio-economic development of the country and other factors and circumstances that directly affect the life of local communities. As general and local conditions change, the local government system must adapt to these changes in order to ensure effective management. Therefore, at each stage of the formation and development of the local government system, it is necessary to solve specific problems that the author will consider in this study.

In the context of Kazakhstan, the development of local self-government is closely linked to the decentralization of power and the democratization of the political system. To achieve this goal, the Kazakh authorities should develop a new regulatory framework that will help strengthen the institutions of local self-government (hereinafter referred to as LSG). Since this is not entirely possible under the current constitutional system, changes must be made to the country's basic legislation, including the Electoral Law and the Law on Political Parties.

The Republic of Kazakhstan today independently determines its course of development in the turbulent space of the world economy, which is no longer determined by the previous vectors of development, but forces it to quickly and efficiently respond to the ongoing restructuring of the global system of economic ties and relations. The internal pace of development of the republic is more than ever influenced by global trends associated with falling prices for energy resources and raw materials, a change in technological structures and a redistribution of the directions of financial flows and investments (Borodin et al., 2020). The situation has also been exacerbated by the global COVID 19 pandemic, the impact of which on the global economy and the economic development of countries and regions has yet to be assessed (Banaszyk et al., 2021). It is already becoming clear that the reproduction of the economy within a single country will take quite a long time, since the current situation has led to the aggravation of the situation of small business and entrepreneurship, which are the basis of the well-being of the average resident of small towns and rural areas. The economic and social rights of the population were also under threat, which, in an unfavorable set of cases, could intensify negative trends against the backdrop of ongoing changes.

Thus, the analysis of the effectiveness of public administration is one of the most urgent problems both in theory and in practice. For the further development of a socially oriented state in Kazakhstan, it is becoming increasingly important to study the theoretical and methodological problems of determining the effectiveness of local authorities.

1. LITERATURE REVIEW

Today, one can observe many differences in the systems of local self-government in different countries. But despite the differences in the public administration system, the formation of an efficiently functioning system of local self-government in the country requires solving the problem of forming a sufficient financial and economic basis for solving local issues (Okuneviciute Neverauskiene et al., 2021; Halaskova et al., 2021). According to the Charter of 1985, local self-government represents is the right and real ability of local self-government bodies to regulate a significant part of state affairs and manage it, acting within the framework of the law, under their own responsibility and in the interests of the local population. According to the European Charter of Local Self-Government, there are four main characteristics without which local self-government cannot be exercised:

− the authority to act within the limits established by law;
− strengthening local self-government with the right to independently manage resources;

– power in the state with clearly defined functions;
– presence of elected bodies of local self-government.

Local self-government throughout the world is the foundation of regional development. In a number of European countries, there is a trend towards relatively high employment in municipal firms, for example, in Germany, almost 50% of the municipal workforce works in municipal firms, and in Italy, almost 30%. In Sweden, 34% of the total number of employees of state enterprises work in municipal firms (Giuseppe and Reichard, 2008). Valach and Bumbalova (2020) state that the largest group (51.23%) consists of municipal firms with fewer than 10 employees. Based on this indicator, such firms belong to the so-called micro firms.

According to studies by Ş. Gherghina, et al. (2020) and V. Mutalimov et al. (2021) small and medium-sized enterprises (SMEs) play a crucial role in local economic development, playing a notable role in job creation, poverty reduction and economic growth, however, they face many barriers to funding. The same can be said about entrepreneurial activity in general and its impact on economic growth (Gomes & Ferreira, 2022). R. Babun (2020) argues that local governments with sufficient administrative and financial autonomy are able to find and attract labor for local businesses, which also ensures the growth of local human capital. Entrepreneurial activity allows local governments to collaborate with other governments to solve development programs that they cannot implement with their own resources (Skica and Rodzinka, 2021). Local councils and mayors can decide whether to use local assets in this way.

Under market governance, local governments prioritize revenues with the primary goal of strengthening local finances. In non-market management, local governments use municipal property to exercise legal powers and prioritize the social characteristics of the goods provided, with revenue generation playing only a secondary role. According to Bumbalova et al. (2021), the main purpose of municipalities should be to carry out economic activities for the benefit of society. On the one hand, this does not automatically exclude activities not related to the autonomy mandate; on the other hand, autonomy puts the achievement of social well-being above profitability.

M. Fil'a et al. (2020) define municipal enterprises as organizations that carry out economic activities that are useful for society, but unprofitable for the private sector, organizations that are useful for the private sector, but cannot be implemented in this sector, and natural monopolies. The business activity of the municipality is a tool for creating suitable economic conditions for the development of entrepreneurial activity in the private sector (Orszaghova and Greganova, 2018; Smutka and Steininger, 2016; Meyer et al., 2018).

The quality of regulation is recognized as a key factor in effective, efficient and proper governance (Weatherill, 2007). For example, as in other countries in the region, due to the needs of citizens and especially businesses, as well as new technological, economic and social changes, the government of the Republic of Montenegro has developed policies and legislation aimed at reducing the administrative burden, especially for businesses. Although most of these strategies have been adopted very recently and the extent of their effect and implementation will be seen in the coming years, it remains unknown whether evidence-based information was taken into account in their development and the needs of stakeholders. However, one of the segments that has received insufficient attention and for which there is no significant empirical information is the consideration of all regulatory, organizational, personnel and practical factors that affect access to administrative services, especially on the part of business (Halili, 2020).

According to A. Ingrams et al. (2020), public administration reform is a powerful concept. If we look back at government institutions of any era, we find instances of movements within the political system seeking to reshape or revise existing institutions. At various times, public affairs leaders have supported specific approaches to change as general organizational principles for how public affairs should be conducted (Kamensky, 1996; Tat-Kei Ho, 2002). C. Pollitt and G. Bouckaert (2011) define public administration reform as "deliberate changes to the structures and processes of public sector organizations to make them (in some sense) perform better".

In accordance with the studies of B. Utibaev and G. Utibaeva (2022), in Kazakhstan, one of the important problems is the lack of clear and actually defined functions and powers at the lower levels of government. Based on the study of the experience of local government abroad, the authors determined that

in solving socio-economic issues it is necessary to endow local governments with sufficient rights and powers. The authors state that the state policy in the field of management at different levels requires the development of a system.

Local self-government, which must be considered as a method or tool of rational public administration. It is substantiated that the more powers are exercised, taking into account local conditions and opportunities, the more comprehensively they will meet the interests of the population and management will be more effective (Utibaev and Utibaev, 2022; Meyer et al, 2017).

2. METHODOLOGY

In the context of the development of public administration in accordance with the principles of sustainable development, the issue of the development of local self-government institutions in Kazakhstan remains relevant. The process of development of local self-government involves not only a change in the legislative framework, but also a real increase in the civic activity of the local community.

Agriculture in Kazakhstan is one of the priority areas of economic development, which has great potential and reserves. Diverse climatic conditions make it possible to grow almost all crops and livestock in temperate zones. Almost a quarter of the country's territory is occupied by steppes, half by semi-deserts and deserts, and the remaining quarter by foothills. 80% of the country's territory is occupied by arable land, with an area of more than 200 million hectares. However, only 40% of this area, or 96 million hectares, is used for agriculture (Figure 1).
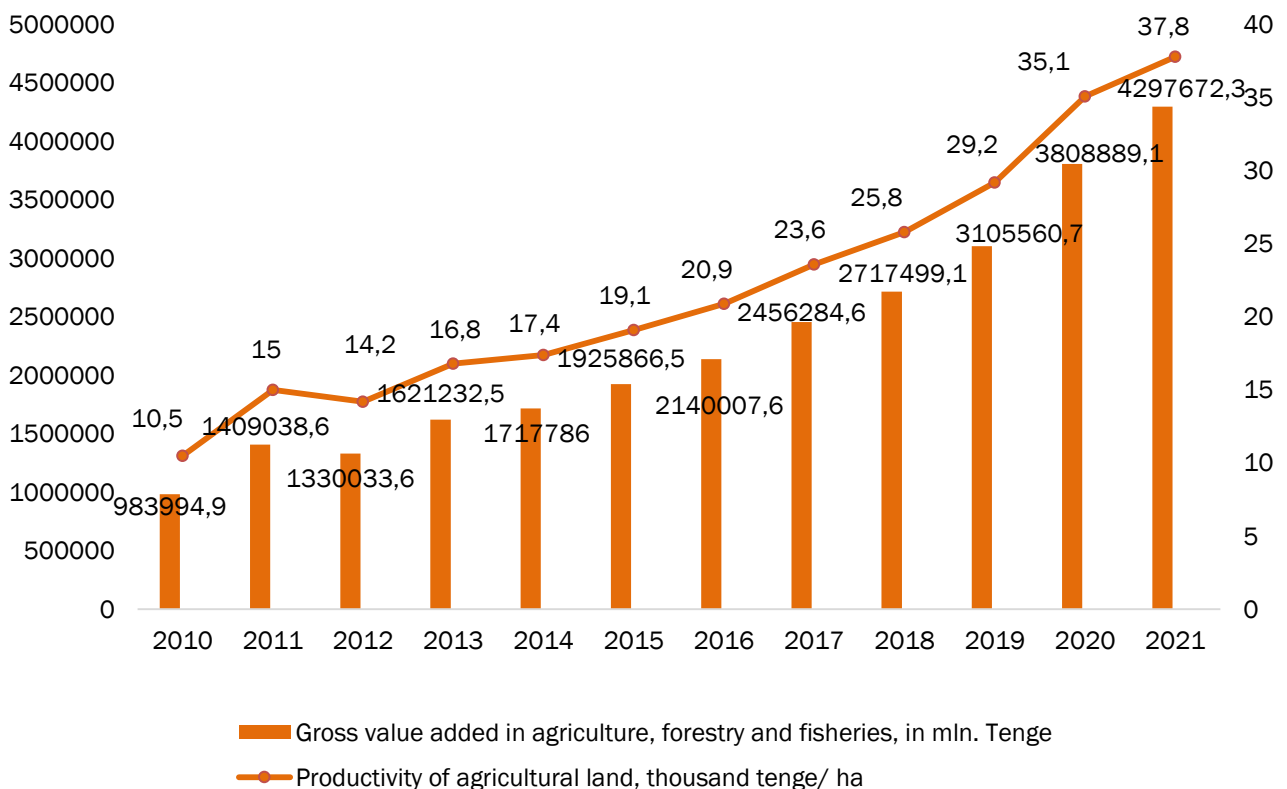

Figure 1. Indicators characterizing agriculture in the Republic of Kazakhstan

Source: compiled by the authors

194

The agricultural sector in Kazakhstan has always been considered a fundamental component of the national economy. This is based on a number of advantages that the republic has:

- the presence of a large area - in terms of the number of agricultural lands per capita, Kazakhstan ranks second in the world;
- being one of the largest exporters of grain and flour;
- growing demand for food from neighboring countries (China, Central Asia, EEC, CIS).

To improve the socio-economic development of the country, the Head of State in the Message to the people of Kazakhstan dated September 1, 2021 "The unity of the people and systemic reforms are a solid foundation for the country's prosperity" identified key initiatives for the well-being of citizens and in the Message to the people of Kazakhstan dated March 16, 2022 "New Kazakhstan: the path renovation and modernization" announced systemic reforms. So, for example, in the future, by 2022, it is planned to introduce 2000 advanced farms and 14 digital farms in Kazakhstan, that is, 1 digital farm in each region, thereby developing eco-tourism (Figure 2).
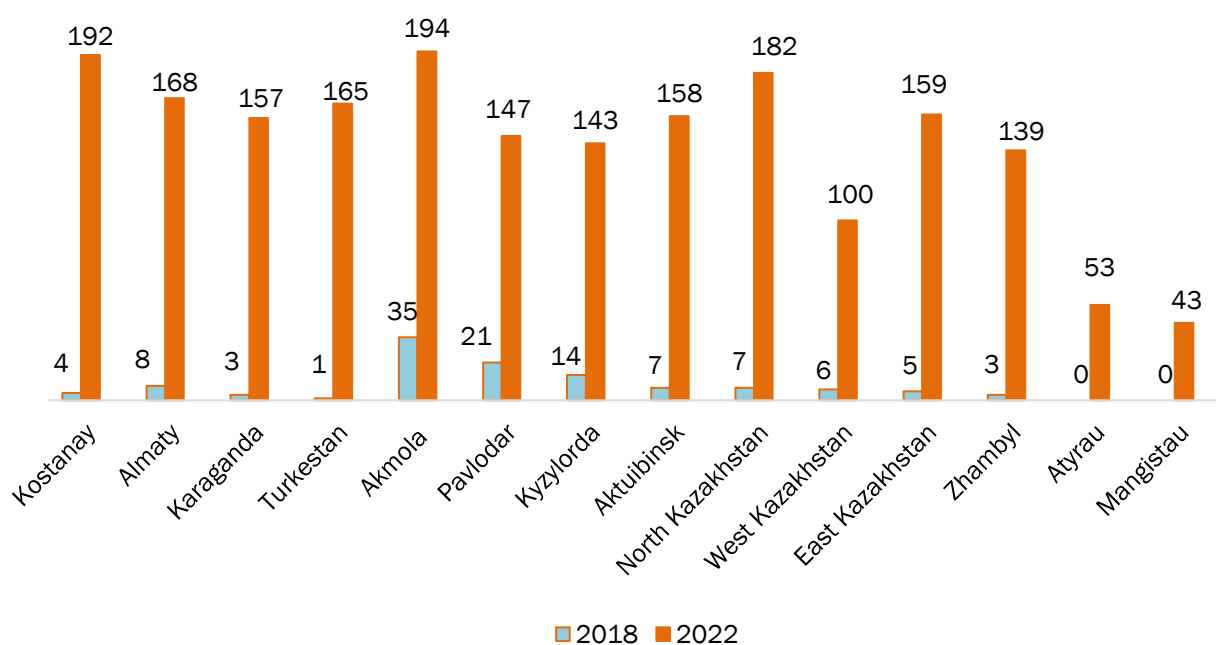
Figure 2. Forecast indicators of the development of advanced farms in the regional aspect by 2022 in Kazakhstan

Source: compiled by the authors

In terms of areas, the distribution of subsidies is leveled off with a slight advantage in favor of crop production (Table 1).

Table 1. Distribution of subsidies in the Republic of Kazakhstan by areas

| Subsidies	Crop production, thousand tenge	Animal husbandry, thousand tenge	Total thousand tenge
Animal husbandry	-	40673246839	40673246839
Fertilizer	19138436739	-	19138436739
Pesticides	26800767236	-	26800767236
Seeds	9497363160	-	9497363160
Hectare subsidy	7667397000	-	7667397000
Total	43965527396	40673246839	84638774235
%	51,9	48,1	100

It is important to note that investment is aimed at ensuring the development of an economic entity in the long term, that is, the development of an investment project is carried out under conditions of uncertainty and includes such a factor as risk (Kozhakhmetova et al., 2019). The dependence of local budgets on centralized transfers of the republican budget is also influenced by the fact that rural akims do not gain independence in decision-making and are not endowed with sufficient powers to independently form the local budget and plan the development of their administrative unit together with representative authorities. Against this background, the transfer to the level of the rural district of part of the communal property, as well as the authority to control the targeted use of land plots and landscaping, is not sufficient to acquire the status of a self-governing unit.

The main part of local budget expenditures is aimed rather at meeting current needs, rather than at technological or innovative development. The reason for such a division of budget expenditures is the lack of proper participation and interest of local executive authorities in regional development and capacity building. As a result, a paradoxical situation arises when strategic programs and projects are developed at the republican level, industrial and innovative development programs are implemented, and at the local level these programs are accepted at best as an opportunity to use additional funds, and at worst as something far from reality. development of the region and has nothing to do with the current situation.

We will consider the system of state local self-government on the materials of the Karaganda region, which, in accordance with the Program for the Development of Regions until 2024, is assigned to the Central-Eastern macroregion, the share of which is:

- in the GDP of the Republic of Kazakhstan is - 18.3% (after the Western macro-region - 23.8% and Almaty - 21.2%);

- the share of the population - 20% (after the Southern macro-region - 37.7%);

- with a high level of urbanization - 69.7% (after the cities of Astana and Almaty).
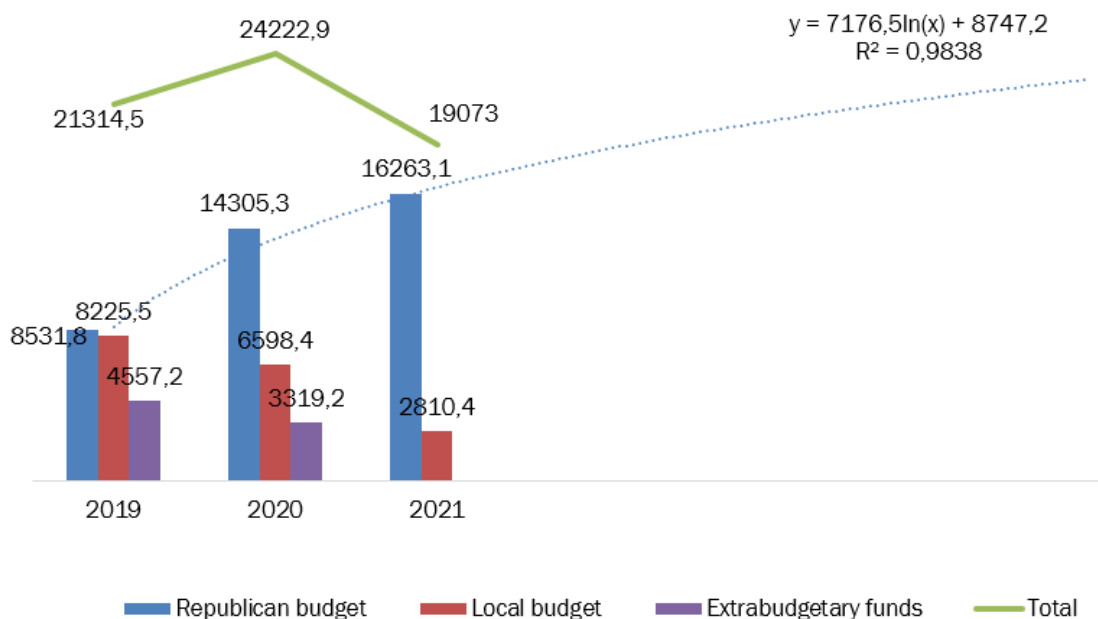

Figure 3. Expenditures for activities financed from the republican and local budgets of the Karaganda region for 2022

Local self-government, especially in rural areas, is of great importance, which is given a place for institutional reforms in the countryside in order to assist the state and local governments in the development

of various forms of civic participation - territorial public self-government, rural credit cooperation, farmer self-government, local support funds rural development and other forms of involvement of residents, without which there will be no real local self-government. In this regard, in order to ensure the economic and social stability of the region, financing is carried out at the expense of the republican and local budgets, which involves an increase in budgetary funds, not taking into account 2021, the indicators of which were dependent due to the Covid-19 pandemic (Figure 3).

It is obvious that the filling of the budgets of district centers and villages depends on the regional authorities to no lesser extent than the filling of regional budgets on the decisions of the central government. According to the data presented in Figure 4, agricultural services in the Karaganda region have unstable dynamics.
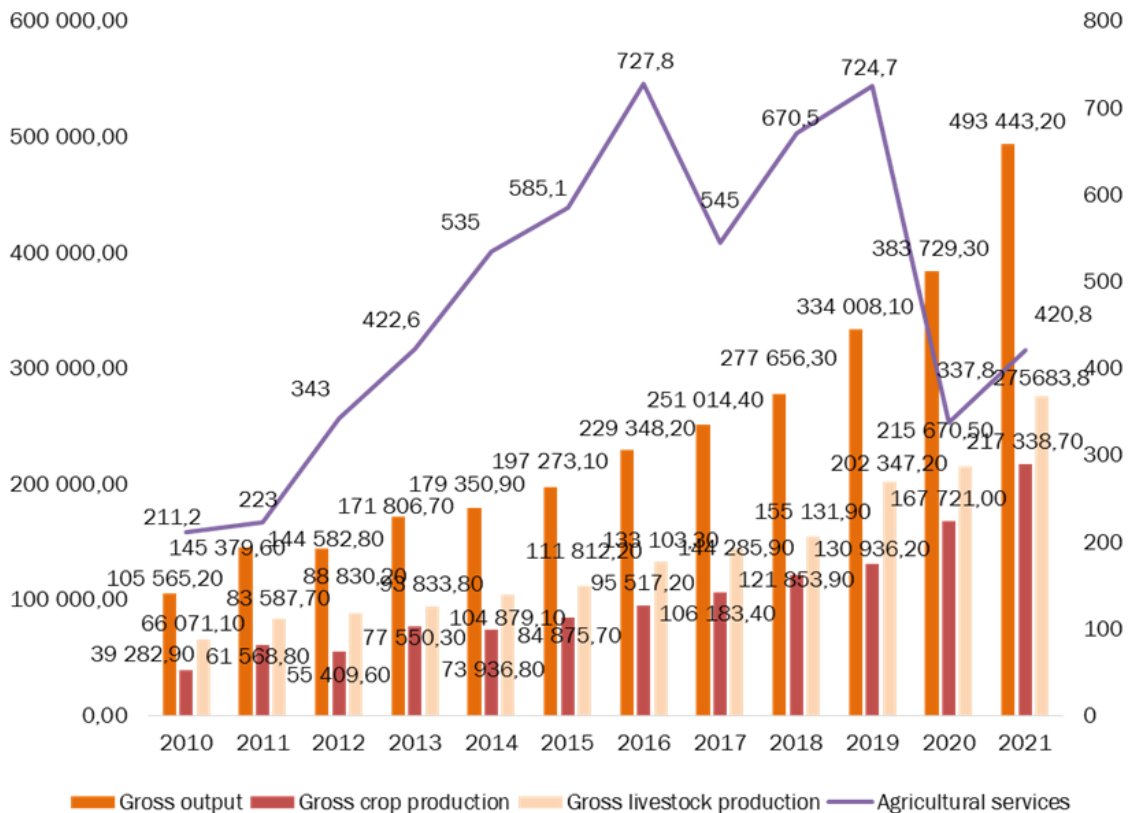
Figure 4. Gross output of agricultural products (services) of the Karaganda region for the period from 2010-2021, million tenge

Source: compiled by the authors according to http://www.stat.gov.kz

3. RESULTS AND DISCUSSION

In order to consider the further dynamics of the development of agricultural indicators in the Karaganda region, using the data presented in Figure 6, Forecast calculations will be carried out using regression analysis and the Excel program. To do this, we will consider the relationship of the system of state local self-government with the indicators of agriculture in the Karaganda region, which relate to one of the administrative budget programs, occupying 90.1% of the implementation.

In accordance with the forecast calculations made, we obtain the following data (Table 2).

Table 2. Forecast values of development indicators of the Karaganda region for 2021-2025 (mln. tenge)

Indicator	2022	2023	2024	2025
Agricultural services				
Trend	742,5118	779,42	816,3282	853,2364
Growth	837,0097	915,7508	1001,899	1096,152
Prediction	742,5118	779,42	816,3282	853,2364
Linear	742,5118	779,42	816,3282	853,2364
Gross output				
Trend	395162,9	420189,9	445216,9	470243,8
Growth	462391,4	519179,1	582941	654533,7
Prediction	395162,9	420189,9	445216,9	470243,8
Linear	395162,9	420189,9	445216,9	470243,8
Gross crop production				
Trend	168484	179373,4	190262,9	201152,3
Growth	202029,1	228460,3	258349,5	292149
Prediction	168484	179373,4	190262,9	201152,3
Linear	168484	179373,4	190262,9	201152,3
Gross livestock production				
Trend	225936,4	240037,1	254137,7	268238,3
Growth	259858,7	290399	324528,6	362669,4
Prediction	225936,4	240037,1	254137,7	268238,3
Linear	225936,4	240037,1	254137,7	268238,3

Source: own

Based on the forecast calculations made with the help of regression analysis, the author proposes measures to implement the local government development policy aimed at creating a system of interaction between the population, local government and government, the effective functioning of which will ensure:

- increasing the role of the population in the qualitative solution of issues of local importance;
- improving the standard of living of the population;
- increasing political stability in the region.

CONCLUSION

Local self-government is inextricably linked with the real object of self-government - the local community. However, society is a complex socio-economic system that covers all spheres of human activity: economic, social, political, ideological, cultural and environmental. Residents should be given real opportunities to independently and responsibly solve local problems through the organization of local self-government. Currently, the reform of local government has serious political limitations and is superficial, aimed more at creating the appearance of democratic change than at true decentralization.

The main problems to be solved in the national local self-government are:

- a clear definition of the territorial basis of local self-government;
- determination of financial resources for the local government budget;
- establishing criteria for distinguishing between common property (state property) and property of local governments, as well as determining the sources of formation of the latter;
- expansion of forms of direct exercise by citizens of the right to local self-government, such as referendums, local legislative initiatives, nationwide discussion of draft decisions of local authorities and other related issues;
- giving the executive bodies of the district and city levels the dual status of the executive bodies of local self-government;
- introduction of accountability of elected members of autonomous bodies;

- including.integration of local community bodies.

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The Agency Cost of Concentrated Institutional Ownership: Evidence from Indonesia

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ARTICLE INFO

ABSTRACT

The purpose is to analyze the role of institutional ownership in firms with managerial ownership in reducing agency costs for the Indonesian listed firm. The polled data from the annual report of companies listed on the In-donesia Stock Exchange and data obtained are pooled from 949 units from 2008 to 2020. We have analyzed through regression of data from dependent is agency cost, independent managerial ownership, annual sales, total assets, independent commissionaires, and control variable is debt ratio. The total sales to total assets ratio has been used as a proxy for agency costs. The result is that higher agency cost proves more effectively (more than 1) in using assets to generate annual sales. Quartile analysis has been used to determine the interval of managerial ownership, the result is that managerial ownership at the lower level (34%-59%) and higher (60%-74%) is significant to agency costs. Inverse, when none of the managerial ownership, much lower (<33%), and much higher (>74%) is insignificant to agency cost. Our results support the predictions of Jensen & Meckling (1976), which state that ownership structure as voting power and monitoring are mechanisms for aligning the interests of shareholders. The presence of much lower of managerial ownership results in managers not having enough power to produce agency costs. No different, when managerial ow-nership is at a much higher level, they also do not have the potential to produce agency costs because institutional investors can monitor more op-portunistic management behav-ior. Both levels of managerial ownership pro-ve more effectively use assets to generate annual sales.Originality/value is a study focusing on one of the largest emerging economies, i.e. Indonesia.

INTRODUCTION

In the seminal paper of Jensen & Meckling (1976), separation of ownership and control produces agency costs when a manager owns less than 100 percent equity. Whenever a manager controls an outside investor's investment other than their own, then agency costs are a natural consequence of being paid by shareholders due to utility maximization by self-interested managers (Lin & Chang, 2008; Rashid,

2016). The sacrifice of wealth by shareholders and potential costs because managers do not bear the full consequences of actions are agency costs. When the manager sells a fraction of the equity, has effective control, and has the incentive and ability to do on-the-job perks, shirk, and maximize self-interest, the shareholder's wealth is reduced.

Managerial ownership is an internal mechanism to prevent and limit managers (McConaughy, 1995; Shleifer & Vishny, 1989; RM Stulz, 1999). The manager aligns with the interest of the shareholders when managers feel that they are a fraction of the firm, and agency costs are reduced (Villalonga et al., 2015). This is because the manager has incentives to reduce underinvestment and enforce company policy restrictions (Jensen & Meckling, 1976; Muñoz Mendoza et al., 2021; Shleifer & Vishny, 1989). Furthermore, an increase in more concentrated ownership stimulates managers to have incentives to force company management to avoid monitoring. This action increases agency costs, called the entrenchment hypothesis (Berger et al., 2005; DeAngelo et al., 2006). In contrast, higher managerial ownership effectively reduces agency costs because it is more operationally efficient (RenéM M. Stulz, 1990). The difference in managers' ownership of the equity fraction produces variable and unsolved agency costs.

Scholten (2005) especially ensures an external control mechanism other than managerial ownership, namely the market for corporate control that can prevent and limit actions that are not aligned with shareholders when ownership is low. High non-manager shareholder ownership incentivizes them to take action to maximize value, and managers do not have to lose their jobs. This way, variations in the market for corporate control reduce moral hazard and adverse selection problems by managers (Coffee, 2001). More convincingly, non-managers are institutional investors with greater monitoring of resources and voting power (Chaudhary, 2022). Thus, agency costs can vary depending on the nature of ownership, namely who owns the firm, i.e., managers/directors or institutional investors as external shareholders. In a sole proprietorship, manager-ownership has zero agency costs. No firm listed on the national stock exchange is 100 percent equity-owned by a manager, and there is no zero agency cost (Jensen & Meckling, 1976). Thus, the ownership structure is measured by the manager's fraction of equity and the institutional ownership's presence.

Our model predicts the degree of relationship presence of institutional ownership in a firm owned by the manager in agency costs. Concentrated institutional ownership provides more monitoring capabilities and voting power in company decisions, impacting agency costs. The theory has suggested, and empirical evidence confirms, that institutional investors can provide active monitoring for more passive or less-informed investors (Almazan et al., 2005). The presence of fund managers among institutional investors results in more effective monitoring than individual investors (Bebchuk et al., 2017). Pressure-resistant investors have big claims at stake; thus, monitoring is carried out more professionally and actively to produce their investment targets (Chaudhary, 2022). Therefore, large institutional investors have more bargaining in each company to have a large, non-negligible effect on shareholders' voting. Institutional investors such as banks and financial institutions with more significant resources produce better capabilities than individuals. In turn, it limits the manager's discretion, so it is possible to prevent them from sometimes making inefficient decisions in the firm (Chaudhary, 2022).

In contrast, when institutional ownership is diluted, the profits from the actions of each shareholder will be shared among other shareholders, and it is unrealistic to concentrate ownership when they invest and are rationally apathetic (Bebchuk et al., 2017). We use the ratio of annual sales to total assets (hereafter, ASTA) as a proxy for agency costs (Ang et al., 2000). ASTA has an inverse relationship with agency cost and manager effectiveness of the firm in using its assets when the agency cost increases. Our paper structure consists of a literature review and hypothesis construction in the second part. The third section describes the research method. Section four presents the results obtained from the data analysis. The conclusion is given in the last section.

1. LITERATURE EMPIRICAL REVIEW

1.1 Corporate Governance Environment in Indonesia: Agency Cost Perspectives

The relationship between ownership structure and governance challenges depends on the concept of dispersion with concentrated ownership (Fama & Jensen, 1983; La Porta et al., 1999). More governance is needed when the ownership structure is dispersed. Therefore, better management is required for shareholders with lower ownership and the limited capacity and ability to monitor managers unless they have incentives and a market for corporate control. In contrast, when ownership is concentrated, the agency shifts into a majority and minority shareholder conflict.

A survey by De La Cruz et al. (2019) in 54 capital markets at the end of 2017 categorizes investors as private corporations and holding companies, public sector, strategic individuals and family members, institutional investors, and other free-float, including retail investors. All types of investors may have different incentives in varying public equity holdings. In turn, it influences them to allocate their capital (market capitalization) to listed firms and how they monitor performance and participate in firms' decision-making.

In companies listed on the Indonesian Stock Exchange, 36 percent of all firms have equity allocations from private corporations, 20 percent from the public sector, 12 percent from strategic individuals, 11 percent from institutional ownership, and 21 percent from retail investors. More than 70 percent of companies are owned by single shareholders (private corporations) who hold more than half of the equity capital. Concentrated ownership worsens when using the definition of institutional investors from The Indonesia Central Securities Depository (KSEI), where corporations are added to institutional investors (Prosperindo, 2020).

The ownership structure model may vary, such as the dispersion found in the United States, so managers' actions are monitored through information disclosure, legal protection, corporate control or takeover market, and managers' lack of equity. However, in several continental European countries, companies are monitored by majority shareholders, such as banks (Chaudhary, 2022). Consequently, agency costs in continental European countries are more absolute than in the United States. In Indonesia, an emerging economy, it is possible to find a mixture of agency costs between traditional conflicts (principal-agent) with concentrated ownership. Regulations in Indonesia affirm the presence of the board of commissioners in the ownership structure, which aims to oversee managers' actions and prevent expropriation by the majority to minority shareholders (IFC, 2014). Due to highly concentrated ownership, lack of takeover regulations, inefficient markets, and significant transaction costs associated with the takeover process, a market for corporate control mechanism is needed.

Managerial Ownership: Internal Mechanism to Reduce Agency Cost

We discuss the substitution between managerial and institutional ownership variations in agency conflict. Managers, like everyone else, have many different personal goals and ambitions that they pursue. One of those goals may be the desire to act in the interests of shareholders, but other than that, managers may also want wealth, empire-building, or something completely different (Shleifer & Vishny, 1989). Inversely, shareholders as investors do not manage the company directly and only care about getting rich from their equity (Cariola et al., 2011).

Additional literature on agents (managers) more informed than principals (external shareholders) has been described by Akerlof (1970) in the used-car market. The presence of asymmetric information makes sellers more informed than buyers. As a result, "lemons" (low-quality cars) are offered more than "plums" (high-quality cars). It is no different when the equity ownership by shareholders is less than 100 percent and handing over the firm's management to the manager. As a result, firms like this are subject to agency costs due to the shareholders' lack of time or ability to observe managers fully. As suggested, separating ownership and control functions from shareholders (Fama & Jensen, 1983) may not be effective. So agency costs are still expected in companies with single ownership when the manager is an outsider.

Firms may have two extremes of separation of ownership and control functions. First, the owner has 100 percent equity ownership, can internalize all monitoring costs, and has the right to hire or fire managers. Agency costs may be low because shareholders receive the same benefits as monitoring costs are

100 percent. Conversely, the manager has no equity and is paid as an employee. Both are impossible in a public firm (Ang et al., 2000), So our focus is that managers own some fraction but not all of the firm's equity. Agency costs arise when engaging managers are not aligned with shareholders and take the form of a preference for on-the-job perks, shirking, and entrenchment, which reduces shareholder wealth. Managers with superior information can take action in the form of empire-building (Jensen & Meckling, 1976), entrenchment (Shleifer & Vishny, 1989), and over-confidence (Stein, 2001).

A model by Jensen & Meckling (1976), which suggests a trade-off in agency cost between firms with less or more insider ownership, has motivated us to investigate further. Agency costs are produced whenever managers control investments from outside investors in addition to their own because there is a fundamental conflict. When the manager's equity ownership is close to 0 percent, the manager will likely have incentives to deviate from the shareholders' (non-manager) goals (Levitas et al., 2011; Lin & Chang, 2008). As a consequence, agency costs increase. In contrast, an increase in more concentrated ownership (close to 100 percent) stimulates managers to have incentives to force company management to avoid monitoring from the capital market. As a result, agency costs increase, which is called the entrenchment hypothesis (Berger et al., 2005; DeAngelo et al., 2006). In contrast, when a manager's share ownership is lower, they are incentivized to align themselves with the majority shareholders (Ang et al., 2000).

Capital market control is believed to be a mechanism to reduce agency conflict by the manager (Shleifer & Vishny, 1989). The takeover threat helps curb conflict because managers know they will be replaced if they perform poorly.

The hypothesis: firms with less or more managerial ownership have higher agency costs than moderate managerial ownership.

1.2 Institutional Ownership: External Mechanism to Reduce Agency Cost

The adverse selection problem arises when a manager withholds valuable information about their abilities to incentivize the manager to increase their value to the firm. It also makes manager dismissal very costly for shareholders. The manager can make investment decisions to control businesses, although it may not be the most efficient decision for the firms (Shleifer & Vishny, 1989). Even though the market for corporate control, such as a takeover, results in managers being forced to take actions following the interests of shareholders (Scholten, 2005). Mark (2016) summarizes several opinions that if the market for corporate control is allowed to function when managers are afraid of a takeover, it produces job losses. Although shareholders do not have direct control, the incompetence of managers will be removed through a takeover process.

In organizations where decision agents do not bear most of the wealth effect of their decisions, the board of directors is used as a controlling device to ensure that managers act efficiently and in the interests of their shareholders. The board of directors always has the power to hire, fire, and compensate top-level decision managers and to ratify and monitor important decisions (Claessens et al., 2000; Fama & Jensen, 1983). In Indonesia, councils can exercise these rights by law, but this is rarely done (Setyahadi & Narsa, 2020). Even when the board of directors does not elect managers, it usually does not have enough information to judge whether the project is maximizing value or not. Acquiring this knowledge can be very costly for the board of directors.

Theoretically, monitoring is defined as observing agent effort or the results achieved through supervision, consequently producing agency costs that shareholders must pay. Monitoring costs by shareholders is suggested to prevent and limit agent behavior from detrimental actions (Jensen & Meckling, 1976; Temel-Candemir, 2005). The presence of the majority shareholder has more significant benefits than the minority. They obtain benefits greater than the costs of obtaining information when asymmetric information is present. In addition, when voting, they get a large enough share of the vote (even with minor ownership) so that it can effectively affect the company's results when it is found that managers are not aligned with the interests of shareholders. Minority shareholders experience this difficulty, although they can collectively internalize it because of the possibility of different interests.

Institutional investors such as banks and financial institutions with greater resources produce better capabilities than individuals. In turn, it limits the manager's discretion, so it is possible to prevent them from sometimes making inefficient decisions in the firm (Jensen & Meckling, 1976). Firms with institutional ownership have fewer agency costs than those without institutional ownership (John & Litov, 2010).

The Hypothesis: concentrated ownership of institutional investors has greater ability and resources to monitor, resulting in lower ASTA effectiveness than dispersed institutional ownership.

2. RESEARCH METHOD

The data source is the annual report of companies listed on the Indonesia Stock Exchange, and data obtained are pooled from 949 units of observation from 2008 to 2020. Companies with equity-owned solely by managers account for 9.06%, whereas the other 90.94% are owned by managers together with institutional ownership. We eliminate the finance sector from the sample because of the different characteristics of the agency conflict (Maher & Anderson, 1999) and the differences in regulators in Indonesia (Martono et al., 2020), with the results in Table 1.

Table 1. Sample of Industry Sectoral

Sector	Number of Observations
Agriculture	13
Basic Industry And Chemicals	117
Consumer Goods Industry	117
Infrastructure, Utilities & Transportation	52
Mining	78
Miscellaneous Industry	78
Property, Real Estate, And Building Construction	156
Trade, Services & Investment	338
Grand Total	949

Source: own

Variable

Dependent Variable: This paper uses the annual sales to total assets as a proxy for agency costs ASTA (Ang et al., 2000; Chaudhary, 2022). This ratio is inversely proportional to agency costs. Firms with a higher ratio (more than 1) have more effective use of company assets in generating annual sales than a lower ratio of firms (less than 1). The reason is that higher sales cannot be claimed as a measure of welfare for shareholders because the cash flow generated from higher sales can be used by management to increase their allowances rather than increase the company's value (Chaudhary, 2022).

Explanatory variables: Institutional ownership is the percentage of shares owned by seven types of institutional ownership, namely corporations, mutual funds, securities companies, insurance, pension funds, financial institutions, and foundations, according to the Indonesian Central Securities Depository (Prosperindo, 2020). Managerial ownership is the percentage of directors' shares (Rashid, 2016). Jensen & Mecking's model finds a trade-off from agency costs between more or less managerial ownership. We loosen the assumption of bonding and residual costs because agency conflicts can naturally be eliminated as long as the principals can fully observe agents' behavior. As a fraction of the owned firm, the institution has the resources to monitor the agent's behavior more.

Control Variable: We use the proposition from Jensen & Meckling (1976) that firms with outside equity and the presence of debt financing affect managers' incentives for moral hazard problems through risk-

shifting. The resulting costs of preventive action can be considered agency costs. Inversely, debt can discipline managers' resource use behavior (Jensen, 1986). Institutional ownership has a bigger role in monitoring when debt produces more agency costs because of the moral hazard and discipline mechanism. The role of debt in determining agency costs increases as Indonesia is a bank-based country (Warjiyo, 2015). Indonesia has a two-tier system, placing independent commissioners more in supervising managers, where majority shareholders are affiliated with directors to take action to damage minority shareholders (Claessens et al., 2000). We eliminate the role of the independent commissioner in the model to invest more in the conflict between managers with institutional ownership, not the majority with the minority.

Data analysis

We divide agency costs into two parts: firms owned by the manager and firms owned by manager-institutional investors. The ownership function to ratify and monitor is more optimal when implemented through voting power (Fama & Jensen, 1983). Monitoring results can be executed and influence in-firm decisions when institutional investors have majority ownership. We divide the level of institutional ownership into quantiles, namely much lower, lower, higher, and much higher (Brandon, 2018).

Data analysis includes a univariate test to determine whether there are differences in agency costs between firms owned by the manager and owned by manager institutions. Thus, we first compare the mean agency costs of the two investigated groups using an independent t-test. To confirm that our finding is robust concerning sample distributions, we also perform nonparametric tests on the difference between the medians through the Wilcoxon test (Ang et al, 2000). Second, we predict agency costs with regression analysis at each level of institutional ownership.

3. EMPIRICAL RESULTS

3.1 Univariate Test

Table 1, panel A presents descriptive statistics for the hypothesized variables explaining agency costs. Columns 2 and rows 1, 3, and 4 show the number of observations and the average and median ratio of annual sales to total assets. Consistent with our previous expectation, namely concentrated institutional ownership, the number of firms owned by managers and institutional investors (863 or 90.94% of observation units) is more than the number of firms without institutional ownership (82 or 9.06% of 949 observation units). Thus, it generates enough observations in these two groups to compare these ASTA ratios statistically. We compare firms owned by the manager and institutional ownership in the much lower, lower, higher, and much higher categories, which correspond to equity ownership of less than 33 percent, 34-59 percent, 60 – 74 percent, and more than 74 percent.

Panel B, columns 4 and 7 find that firms with much lower and much higher institutional ownership are significant and robust. The presence of much institutional ownership as shareholders in firms with owned managers (34 percent) produces more effectiveness in using its assets of 37 percent than without institutional ownership. As a result, the firm's effectiveness in using its assets is increased by 2,144 (in billion Rupiah) in capturing annual sales (37 percent of 5,722). When institutional ownership is much higher, it increases the average total assets of 1,261 in obtaining yearly sales (28 percent of 4,505) from higher institutional ownership. Of course, the present value of the agency's cost of equity is undoubtedly several times higher.

We verify directly that agency costs are generated due to less or more insider ownership (Jensen & Meckling, 1976). Institutional ownership is inversely proportional to managerial ownership – much lower institutional ownership has quite a high managerial ownership and continues to decrease when institutional ownership increases. Managerial ownership is 34% and 3%, and the mean agency cost is 1.04 and 1.25 in firms with much lower institutional ownership and much higher institutional ownership. Concen-

trated institutional ownership produces more effectiveness in using its assets than concentrated managerial ownership. Both types of institutional ownership have the firm's effectiveness in using its assets more than 1. Managers have more incentives to produce annual sales that exceed total assets. We exclude the extreme case where manager ownership is 100 percent equity and zero percent equity. Thus, the level of managerial ownership varies from 0 to 100 percent, producing differences in agency costs. Therefore, managers align with shareholders' interest on less or more insider ownership.

Interestingly, we suspect that when managerial ownership is low enough, the average is 34% (not enough voting power), which produces a market for corporate control in increasing effectiveness in using its assets. This is partly because achieving the voice needed to make corporate management decisions is difficult. No different, when institutional ownership is concentrated (presence by the fund manager), effectiveness in using its assets is achieved through monitoring. The regression test to clarify the univariate is presented in table 2, Panel B.

Table 2. Descriptive Statistics

		Panel A: Descriptive Statistics					
			Institutional Ownership				
	All Firm	0%	<33%	34% - 59%	60% - 74%	> 74%	
		None	Much Lower	Lower	higher	Much Higher	
N Obs	949	86	90	250	247	276	
Agency Cost							
mean	0.99	0.68	1.04	0.80	0.97	1.25	
median	0.83	0.57	0.79	0.77	0.76	1.07	
Managerial Ownership (Mean)	0.11	0.31	0.34	0.09	0.06	0.03	
Annual Sales (Mean of Billion Rupiah)	8,265	552	3.137	17,193	7,692	4,766	
Total Assets (Mean of Billion Rupiah)	11,677	1,957	5,722	24,404	12,366	4,505	
Indp Comm (Mean)	0.354	0.471	0.558	0.516	0.496	0.515	
Debt Ratio (Mean)	0.510	0.471	0.558	0.516	0.496	0.515	
	Panel B: Difference in Mean and Median						
Diff Mean			0.37*	-0.25*	0.17*	0.28*	
Median Diff			0.22*	-0.03	-0.01	0.31*	

Source: own

Table 2, Panel B examines firms with no institutional ownership (column 2). When managers have relatively low company equity, an average of 31 percent, managers do not have enough voting power in company decisions. The classic problem in the separation of ownership and control is that the personal vote of the manager will be counted little or not at all in the meeting. Manager vote will practically be an alternative or not considered because there is too little ownership (Coffee, 2001). Indonesian Corporate Law (ICL) distinguishes rights between individual and collective shareholders related to the decision-making process and firm organization (IFC, 2014). More specifically, the rights of shareholders based on the percentage of common stock ownership are attending and voting in the General Meeting of Shareholders (GMS); receiving payment of dividends and remainder of assets from liquidation; exercising other right under the ICL. Various regulations in Indonesia allow controlling shareholders from a group of minority shareholders to have more voting power than individual shareholders. As a result, the voting power of equity owned can control the company directly and indirectly to (1) determine the appointment or dismissal

of directors or commissioners; or (2) amend the articles of association of the public company, the company (Kairupan, 2009).

We do not divide institutional investors like the model by Almazan et al. (2005), where they are divided into active institutional (more skilled employees, the ability to collect more information, faced with fewer regulatory and legal issues) and passive institutional investors. The Indonesia Central Securities Depository (KSEI) classification of institutional investors is used, i.e., corporations, mutual funds, securities companies, insurance, pension funds, financial institutions, and foundations (Prosperindo, 2020).

Columns 3 to 6 explain when much lower institutional ownership in a firm owned by a manager produces an ASTA ratio of less than one or less effectiveness of the firm in using its assets at 34% equity held by the manager (negative and significant). Increasing institutional ownership to moderate produces more effectiveness for the firm in using its assets by the manager. In contrast, when much higher institutional ownership results in managers with shares, it does not determine the effectiveness of ASTA. It produces interesting conflicts whenever managers are managed by outside investors other than their own. This situation results in managers only bearing the cost of a smaller fraction, thus only bearing a small part of their actions. The manager's actions can provide financial benefits, including monetary payments, higher salaries, and empire-building. The manager also gets non-pecuniary benefits, including non-monetary facilities. It is worse when institutional ownership is much lower and cannot prevent managers from voting. They seem to let managers act on their behalf.

Thus, when managers have more equity than institutional ownership, asymmetric information produces low ASTA effectiveness. Dispersion of ownership exacerbates the situation, where each shareholder has different interests. The manager bears only a fraction of the cost of a fraction of the equity, and there may be no difference in benefits when the ownership is 100 percent (Jensen & Meckling, 1976).

Columns 4 and 5 explain institutional ownership rising together with the disappearance of management ownership in the moderate category (lower and higher), producing more effectiveness for the firm in using its assets. Institutional ownership has a more significant monitoring role than the individual. Institutional investors have big claims at stake, so they monitor more professionally and actively to achieve their profits (Reed, 2003). These institutions have investment interests, and, more importantly, each institutional investor has a fund manager who manages their funds; in other words, the monitoring carried out by these institutional investors benefits themselves (Bebchuk et al., 2017).

3.2 Regression Analysis

Institutional ownership from lower to higher produces more effectiveness of ASTA even though firms with lower institutional have "capital" total assets greater than higher institutional ownership. We suspect that the increase in equity ownership by institutions allows an increase in voting power to implement monitoring results. Institutional intervention is significant when the total assets are greater, and more agency conflict is produced through the increase in total assets (Ang et al., 2000). More specifically, Bebchuk et al. (2017) developed ownership theory based on private benefits extracted by controlling shareholders.

We believe that when the potential for personal gain is more (more total assets), the institution is incentivized to take control to earn profits and block the possibility of outsiders' takeover. A survey by Shleifer & Vishny (1989) adds to our insight into why some countries have a low concentration of ownership (e.g., US) and some high (e.g., Europe).

Table 3. Regression Analysis

	None	Much Lower	Lower	higher	Much Higher	All Firm
Dependent = Agency Cost	Coef	Coef	Coef	Coef	Coef	
Intercept	0.708*	2,716*	0.541	-0.856	-2,148*	0.111
Managerial Ownership	-0.102	-0.955*	0.836*	2,269*	-0.126	0.602*
Institutional Ownership		-0.482	1,089*	1.564	3,548*	0.993*
Total of Independent Commissioner		-2,949	-0.770*	1,214*	0.331	0.182
Leverage		-0.221	-0.142	0.432	0.577*	0.315*
R square	0.003	0.115	0.079	0.067	0.118	0.050
F test	0.218	2.750	5.225	4.373	9.084	11.271
P value of F Test	0.642	0.033	0.000*	0.002	0.000*	0.000*

* Sig at 5 percent

Source: own

3.3 Results Discussion

This section estimates how variation in ownership structure is essential for agency costs. Agency theory has predicted that when management owns less than 100 percent of equity, shareholders pay the agency costs resulting from shirking and consumption of perquisites by managers (Jensen & Meckling, 1976). In the dispersed type of ownership, without a controlling (majority) shareholder, commissioners and directors are incentivized to dictate their successors. Since dispersed shareholders can thus be expected to be rationally apathetic, managers will be relatively constrained in their actions through the market for corporate control. This way, the market for corporate control substitutes for monitoring and reduces managers' asymmetric information and the moral hazard problem (Easterbrook, 1984). The basic idea is that the stock market offers a mechanism to take over underperforming firms and thus provide a way to replace existing management with more efficient ones or merge firms with more efficient rivals, even in a dispersed ownership structure. Efficiency here, of course, is understood from the perspective of shareholders. When the mechanism for disciplining managers together with performance is not suitable, the company's takeover in a competitive market (the market for corporate control) becomes one of the most effective ways for shareholders to eliminate managers who do not maximize value (Shleifer & Vishny, 1989). The role of the market for corporate control is substituted for monitoring by other shareholders (Scholten, 2005).

When institutional ownership is more concentrated without managerial ownership, it produces more effectiveness for the firm in using its assets. Our findings strengthen the theory from Bebchuk et al. (2017) that institutions with better monitoring capabilities and more equity have a completely different incentive. Institutional investors generally enter into contracts with investment advisors (fund managers) to manage portfolios of investment funds. Investment managers acting on behalf of institutional investors need support for the safety of investment by firms. The increase in voting through ownership can be used in GMS regarding the selection of directors and intervention in the company's internal processes. Investment managers must secure their investment assets by voting and voting based on the clarity of their information. Institutional investors participate in corporate voting (Aghion et al., 2013).

CONCLUSION

In this article, we use data from listed firms in IDX for 2008 – 2020 to examine the difference in agency costs between firms owned by a manager with and without institutional ownership. Companies in Indonesia are more than 90 percent owned by institutional investors and are inversely proportional to managerial

ownership. Manager as minority ownership and institutional presence as majority shareholder produce more effectiveness of the firm in using its assets.

We also examine the determinants of agency costs in the regression framework. Our results support the predictions of Jensen & Meckling (1976), which state that ownership structure as voting power and monitoring are mechanisms for aligning the interests of shareholders. First, managers cannot make decisions because of the low power of equity, so the allocation of total assets in capturing annual sales is determined by institutional ownership. Second, it produces more effectiveness for the firm in using its assets because the fund manager of institutional investors (majority ownership) acts for them, not the interests of the firm whose equity is owned (Bebchuk et al., 2017). Thus, the counterproductive mechanism produces more effectiveness for the firm in using its assets when institutional owners, through fund managers, intervene more with managers who own some shares. Our results have an important implication that the sample companies have business relationships with institutional ownership, and we then leave the substance of these relationships for future research agendas.

FUNDING

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