JOURNAL OF CRITICAL REVIEWS

ISSN- 2394-5125 VOL 8, ISSUE 02, 2021

Corruption and the Performance of Amman Stock Exchange

1.Yarob Al-Shraideh, Economic Researcher, Irbid, Jordan.
2. Prof. Ahmad Ibrahim Malawi, Department of Economics, Yarmouk University, Jordan (Corresponding Author: ahmad.malawi@yahoo.com).

Abstract

This study aims to investigate the short and long run impacts of corruption on the performance of the ASE for the period (1998-2017).Both Autoregressive Distributed Lag (ARDL) bounds testing approach of co-integration and Nonlinear Autoregressive Distributed Lag (NARDL) are employed to examine the linear and nonlinear relationships between corruption and the performance of ASE.

The empirical results for the ARDL and NARDL models have revealed the existence of a long-run relationship between corruption and the volume of trade in ASE as a proxy of the performance of ASE. The long-run parameters of the models came in line with economic theory, which implies that the corruption negatively affects the volume of trade. For the ARDL a 1% increase in corruption level leads to a 2.64% decrease in the volume of trade. The speed of adjustment after a shock to restore equilibrium in the dynamic model is found to be (-88%) a year and is highly significant (1% level). And for the NARDL model, the asymmetric effect of corruption reveals that a positive change in corruption effects negatively on the volume of trade, where an increase in corruption by 1% leads to a decrease by 4.33% in the volume of trade, and the negative change of corruption effects positively on the volume of trade, where a decrease in corruption by 1% leads to an increase by 6.12% in the volume of trade. The speed of adjustment in the dynamic model is found to be (-70%) and it is highly significant (1% level).

Introduction

For many years, the phenomenon of corruption has sparked the interest of not only national governments and academia, but also international society (Munhoz, 2008) since corruption is considered to be the single greatest obstacle to economic and social development (Pinheiro, 2010). According to the World Bank, corruption is defined as "the abuse of public or corporate office for private gain". The Transparency International (TI) has designed a corruption index; corruption perception index (CPI) for measuring the level of corruption across countries in the world. This study aims to investigate the short and long run impacts of corruption on the performance of the ASE for the period (1998-2017).

Literature Review

There are different approaches on how corruption may affect stock market performance, which can be called the corruption-stock market nexus. Corruption serves as a lubricant for the wheel of stock market, or hinders the wheel of stocks' markets, or its impact depends on the basis of the country's development. Early studies document a positive impact of corruption on stock market development through corruption's impact on foreign direct investment, acting as a "grease" by expediting transactions and allowing private firms to overcome ineffective regulations and governmental institutions (Aljazaerli et al., 2016). Lau et al., (2013) argue that bribery (a proxy of corruption) helps firms to overcome inefficiencies in the economic system and decreases uncertainty; which may lead to a positive performance in countries that do not have effective government institutions and governance systems.

A contradictory view argues that there is a negative impact of corruption on stock market development since corruption makes it more difficult and costly to conduct foreign operations through obtaining licenses and permits (Habib&Zurawick, 2002), which raises the cost of business and uncertainty in the decision making process.

Other points of view suggest asymmetric impact of corruption on stock market development on the basis of the country's development, i.e. whether developing or developed (Aljazaerli et al., 2016). Pinheiro (2010) suggests that, in more developed countries, corruption is inversely related to stock market returns; while in developing economies, higher levels of corruption impact positively on stock market returns.

Regarding the previous research about this topic, several studies have been implemented on different developing and developed countries. Some of these studies show that there is negative impact of corruption on financial markets developments and performance (see Ahmad & Ali, 2010; Yartey, 2010; Bolgorian, 2011; Jain et al., 2012; Abdul-Qadir&Yaroson, 2013; Ayaydin&Baltaci, 2013). On the other hand Shahbaz et al., (2013) andAljazaerli et al., (2016) studies of the impact of corruption on financial markets find that corruption is positively associated with financial markets developments.

ISSN- 2394-5125 VOL 8, ISSUE 02, 2021

Descriptive Analysis

The descriptive analysis of variables is one of the methods used in interpretation the scientific phenomena,the analysis of the statistical results of the variables is also important in investigating the results of the studied phenomenon.The descriptive statistics of the data utilized for this paper are shown in table (1).

Table (1): Descriptive statistics of the variables

Descriptive statistics	VT	COR	FI	GGDP	IR
Mean	5369.038	51.45000	7532.572	0.045697	0.0616875
Median	2888.243	52.00000	8863.365	0.037853	0.0562850
Maximum	20318.01	56.00000	14285.74	0.085673	0.120640
Minimum	334.7240	43.00000	1463.520	0.019700	-0.0449000
Std.Dev.	6005.513	3.394655	4162.953	0.023415	0.0370321
Skewness	1.301800	-0.845350	-0.326245	0.575454	-0.910822
Kurtosis	3.388440	3.054911	1.762273	1.813723	4.524798
Jarque-Bera [Probability]	5.774679 [0.055724]	2.384565 [0.303528]	1.631426 [0.442324]	2.276535 [0.320374]	4.702833 0.095234
Sum	107380.8	1029.000	150651.4	0.913946	1.233750
Sum Sq.Dev.	6.85E+08	218.9500	3.29E+08	0.010417	0.0260561
Observations	20	20	20	20	20

Note: VT: Volume of Trade (in million JD). COR: Corruption level. FI: Foreign Indirect Investment to ASE (in million JD). GGDP: Growth in Real Gross Domestic product (as percentage). IR: Real Interest Rate as percentage.

The probability of the Jarque-Bera (above 5%) indicates that all variables are normally distributed. On the other hand, the value of the standard deviation (Std.Dev.) of the volume of trade is found to be the largest (6005.513) which indicates that the volume of trade have the largest fluctuations, followed by Foreign indirect investment (4162.953). The results indicate positive and negative skewness meaning that the variables are asymmetric. Kurtosis higher than 3 for VT, COR, and IRmeans that these variables have a leptokurtic distribution, and for FI and GGDP kurtosis lower than 3 means that they have a platykurtic distribution.

The ASE aims to operate, manage and develop the operations and activities of securities, commodities, and derivatives markets inside and outside Jordan. The ASE seeks to provide a strong and secure environment to ensure the interaction of supply and demand forces for trading in securities in proper and fair trading practices, and raising the awareness and knowledge of investing in the financial markets and defining the services provided by the ASE Company. It's worth to mention that ASE plays an important role in serving the national economy.

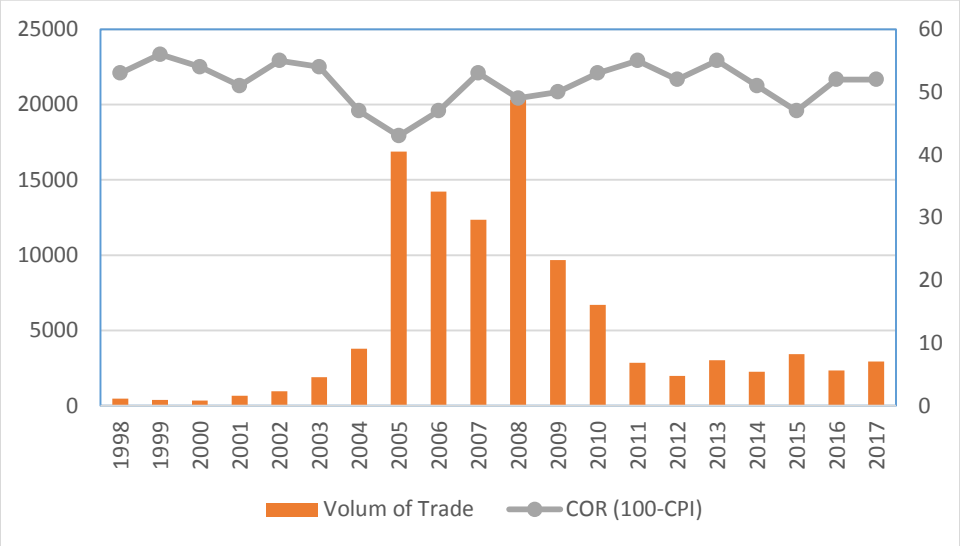

Figure (1): The Volume of Trade in ASE, and Corruption level for Jordan
Source:Amman Stock Exchange and Transparency international

ISSN- 2394-5125 VOL 8, ISSUE 02, 2021

.

Figure (1) represent the progress of the volume of trade in ASE (a proxy of Amman Stock Exchange performance) and the corruption level for Jordan, as figure (1) shows that the volume of trade in ASE fluctuated over time. As shown there was a general rising trend in the volume of trade from year 1998 until the end of year 2005, where the volume of trade was JD 464.374 million in 1998 and JD 16871.051 million in 2005. Then the volume of trade started to decline gradually until the end of 2007 when it reached JD 12348.101 million.

As table (2) shows, there was an improvement in the volume of trade in year 2008, where the volume of trade reached JD 20318.014 million, but for several reasons, the most important of which is the global financial crisis (Al-Sheyab, 2018), the performance of the ASE began to decline until the end of year 2012, where the volume of trade reached JD 1978.813 million, which means that the decline in the volume of trade is about 90% in 2012 compared with2008.The volume of trade in Amman Stock Exchange was then fluctuated until 2017, where it reached JD 2926.233 million.

For corruption, it has spread significantly in many countries of the world, including Jordan, and has become a major force threatening the economies of different countries, Jordan is one of the countries that recognized the existence of corruption and began to take the necessary measures to combat this phenomenon.

Transparency international designed corruption perception index (CPI) to measure the level of corruption among countries. This index ranges between 0 and 100, where 0 implies the highest level of corruption and 100 indicates that the country is free of corruption. For the purpose of this study, corruption level (COR) is measured by (100-CPI), which means that (COR) ranges between 0 and 100, where 0 means the lowest level of corruption and 100 means the highest level of corruption.

Table (2) shows that Jordan suffers from a moderate level of corruption in the public sector. It was noted that there was a rise in the level of corruption from year 1998 until the end of year 1999 with 3 points. In 1998, the Corruption level reached 53 points, and Jordan ranked 38 out of 85 countries in the world. Jordan began a gradual improvement in year2004 and 2005, with a score of 43 in 2004 and 47 in 2005, then started to fluctuate until it reached 52 in year 2017 (Transparency International, 2017).

Table (2): Corruption level for Jordan, and the Volume of Trade in ASE

Year	Corruption Perception index (CPI)	Jordan Rank In the world	Number of Countries included in the evaluation	COR	The Volume of Trade in ASE in Million JD
1998	47	38	85	53	464.374
1999	44	41	99	56	389.476
2000	46	39	90	54	334.724
2001	49	37	91	51	668.652
2002	45	40	102	55	950.272
2003	46	43	133	54	1885.176
2004	53	37	145	47	3793.251
2005	57	37	158	43	16871.051
2006	53	40	163	47	14209.87
2007	47	53	179	53	12348.101
2008	51	47	180	49	20318.014
2009	50	49	180	50	9665.310

2010	47	50	178	53	6689.987
2011	45	56	183	55	2850.252
2012	48	58	177	52	1978.813
2013	45	66	177	55	3027.255
2014	49	55	175	51	2263.404
2015	53	45	168	47	3417.079
2016	48	57	176	52	2329.466
2017	48	59	180	52	2926.233

Source: Transparency International and Amman Stock Exchange
Note: COR=100-CPI

As seen in table (3), all the coefficients of correlation among the independent variables (in absolute value) are less than 81%, which indicates that there is no multicollinearity among the independent variables.

Table (3):Coefficientsof Correlation among the study variables.

Coefficientof correlation	Log(VT)	Log(COR)	Log(FI)	GGDP	IR
Log(VT)	1	-0.61033938	0.87579383	0.49558725	-0.7313763
Log(COR)	-0.61033938	1	-0.4236558	-0.5568005	0.32779941
Log(FI)	0.87579383	-0.4236558	1	0.10988570	-0.6380920
GGDP	0.49558725	-0.5568005	0.10988570	1	-0.3978126
IR	-0.7313763	0.32779941	-0.380920	-0.3978126	1

The dependent variable is Log(VT), and all other variables are independent.
Note: COR=100-CPI

Methodology

Based on economic theory and previous studies (see Abdul-Qadir et al., 2013; Aljazaerli et al., 2016),and for achieving the objective of this study, the general econometric model takes the following form: VT = f (COR, FI, IR, GGDP)

and the linear semi-log equation:

$$\text{Log}\,(VT_t) = \propto_0 + \propto_1 \text{Log}\,(COR_t) + \propto_2 \text{Log}\,(FI_t) + \propto_3 IR_t + \propto_4 GGDP_t + U_t \ldots\ldots (1)$$

Where:

- (VT) Volume of Trade: is the total number of shares traded multiplied by their corresponding prices. These values obtained through the statistical bulletins of the ASE.
- (COR) Corruption Level: Corruption perception index (CPI) published by the Transparency International, is used as a proxy to the level of corruption. This index ranges between 0 and 100, where 0 implies the highest level of corruption and 100 indicates that the country is free of corruption. For the purpose of this study the Corruption level (COR) is measured by (100-CPI), which implies that 100 implies the highest level of corruption and 0 implies the lowest level of corruption.
- (FI) Foreign investment: represents the market value of foreign indirect investment in Amman Stock Exchange evaluated in Jordanian Dinar. The FI is measured by multiplying the ratio of shares owned by non-Jordaniansby ASE capitalization in each year, which obtained from the ASE data base.
- (IR) Real interest rate: The value of real interest rate obtained from The World Bank database.
- (GGDP) Growth Rate of Real Gross Domestic Product: where GGDP means the annual growth rate of the value of all final goods and services produced in a country during a specific period of time in real terms. The values of (GDP) at constant market price (2010=100) obtained from Central Bank of Jordan database (CBJ).

For obtaining robust and concrete results the non-linear semi-log equation is used as follows:

ISSN- 2394-5125 VOL 8, ISSUE 02, 2021

$$Log\ (VT_t) = \propto_0 + \propto_1 Log\ (COR_t\_P) + \propto_2 Log\ (COR_t\_N) + \propto_3 Log\ (FI_t) + \propto_4 IR_t + \propto_5 GGDP_t + U_t \ldots\ldots (2)$$

Where:

COR_P: positive partial sum of Corruption.

COR_N: negative partial Sum of Corruption.

$\propto_0, \propto_1, \propto_2, \propto_3, \propto_4, \propto_5$**:**the estimated parameters.

and the other variables as defined above.

This paper utilizes both ARDL (Autoregressive Distributed Lag) and NARDL (NonlinearAutoregressive Distributed Lag) approachs. The ARDL approachesof Pesaran and Pasaran (1997) and Pesaran et al. (2001), which have recently become an increasingly popular techniques in econometrics for the following reasons. Firstly; this approach has better small sample properties in contrast to other techniques, i.e. this approach is relatively more efficient in small or finite sample sizes (Fous& Magnus, 2006) as the case of this study. Secondly; it doesn't require examining the stationarity or order of integration for the variables. Pesaran and Pasaran (1997) argue that this approach can be applied to series irrespective of whether they are I(0), I(1), or a mix of the two. Thirdly; it allows the variables to have different optimal lags. Fourthly, ARDL approach helps in eliminating the problems resulting from nonstationary time series data (Aljarrah, 2010). Fifthly; by applying the ARDL technique, unbiased estimates of the long-run model are obtained. Sixthly; the ARDL approach helps in separating the effect of the predictors into long-run and short-run effects. Finally; failure to test hypothesis due to endogeneity problems in Engle-Granger method, can be resolved by ARDL (Harris &Sollis, 2003).

The NARDL approach advanced by Shin et al. (2014) is also employed in this study to explore the asymmetric effect of corruption on ASE performance in the long and short-run, in order to check the robustness of the ARDL model.

Shin et al. (2014) have developed the NARDL model, which yields significant advantages over the existing methodologies in jointly modeling the asymmetries and co-integration dynamics in a single step, thus improving the performance of the co-integration test in small samples. NARDL applied irrespective of whether the regressors are stationary at levels or at the first differences; i.e. I(0) and I(1).

The asymmetric NARDL framework is particularly suitable for research, as it allows not only to gauge the short and long-run asymmetric, but also to detect the hidden co-integration (Demir, 2015).Granger and Yoon (2002) introduce the notion of hidden co-integration, in which the co-integrating relationship is constructed based on the positive and negative components of the variables.

Empirical Investigation

Before estimating the ARDL and NARDL coefficients, some preliminary tests have been implemented such as:

Unit Root Test for Stationarity:

To avoid spurious regression that might give meaningless and vague results, this test is firstly applied to check the stationary of the variables,to ensure that none of the variables is integrated of order 2 or higher because the bounds test is based on the assumption that the variables are I(0), I(1) or, a mix of both(Pesaran&Pasaran, 1997). Two methods are commonly used to test the null hypothesis of unit root; Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP), these tests are widely used for determining the stationarity status.

According to the results of the ADF and PP tests presented in table (4), the orders of integration of the variables are mixed. According to ADF results some of the variables are stationary at level at 5% levels of significance such as Log(VT), Log(COR)and IR, and the other variables GGDP, and Log(FI) are stationary at the first difference at 5% level of significance. Even though the results of the ADF and PP tests don't agree on the same order of integration for all the variables but they agree that all the variables are mixed I(0) and I(1).

Table (4): Augmented Dickey Fuller Test and Phillips-Perron Test.

Test:	Augmented Dickey Fuller Test (ADF)					Phillips-Perron test (PP)				
Variable	Level		First difference		Order of integration	Level		First difference		Order of integration
	T-Statistic	Critical Value at 5%	T-Statistic	Critical Value at 5%		T-Statistic	Critical Value at 5%	T-Statistic	Critical Value at 5%	
LOG (VT)	-3.09	-3.06	-3.22	-3.04	I(0)	-1.64	-3.03	-3.26	-3.04	I(1)
LOG (COR)	-3.26	-3.04	-5.21	-3.05	I(0)	-2.45	-3.03	-6.41	-3.04	I(1)

IR	-3.19	-3.03	-8.18	-3.04	I(0)	-3.17	-3.03	-9.12	-3.04	I(0)
LOG (FI)	-1.47	-3.03	-3.12	-3.04	I(1)	-1.49	-3.03	-3.18	-3.04	I(1)
GGDP	1.20	-3.03	-4.19	-3.04	I(1)	-1.24	-3.023	-4.19	-3.04	I(1)

Lag Length Selection

According to all criteria of lag length selection, the optimal lag length is found to be one, as shown in the table (5).

Table (5): The lag length test

Lag	LR	FPE	AIC	SC	HQ
0	NA	8.46e-07	0.205580	0.454116	0.247642
1	87.19070*	1.61e-08*	-3.869818*	-2.378598*	-3.617444*

*Note: (AIC): Akaike Info Criterion, (SC): Schwarz Criterion, (HQ): Hannan – Quinn, (FBE): Final Prediction Errorcriterion

Bounds Test for Co-integration:

After determining the order of integration of each variable and in an attempt to investigate the existence of a long-run equilibrium relationship among these variables, the autoregressive distributed lag (ARDL) bounds testing approach proposed by Pesaran et al. (2001) is employed.

The decision whether there is a co-integration or not, depends on the calculated F-value (Wald-Test). If F-statistic lies above the UCB, then the null hypothesis is rejected, meaning that the variables are co-integrated. If F-statistic lies below the LCB, then the null hypothesis of no co-integration is accepted, meaning that the variables are not co-integrated. If F-statistic lies between the UCB and the LCB, then the results are inconclusive (Pesaran et al., 2001). The results of the bound test for co-integration for ARDL and NARDL models are presented in table (6) and table (7) respectively.

Table (6): Bound Test Results for ARDL Model

Equation	F-Statistics	1%		2.5%		5%		K= 4
		I(0) LCB	I(1) UCB	I(0) LCB	I(1) UCB	I(0) LCB	I(1) UCB	The Decision
Log(VT)=f(Log(CR), Log(FI), IR, GGDP)	19.0418	3.29	4.37	2.88	3.87	2.56	3.49	Co-integration
Log(COR)=f(Log(VT), Log(FI), IR,GGDP)	4.75207	3.29	4.37	2,88	3.87	2.56	3.49	Co-integration
Log(FI)=f(Log(COR), Log(VT), IR, GGDP)	6.26696	3.29	4.37	2.88	3.87	2.56	3.49	Co-integration
GGDP=f(Log(COR), Log(VT), IR, Log(FI))	3.91657	3.29	4.37	2.88	3.87	2.56	3.49	Co-integration

IR=f(Log(COR),Log (VT), GGDP, Log(FI))	21.5464	3.29	4.37	2.88	3.87	2.56	3.49	Co-integration

Table (7): Bound Test Results for NARDL

Equation	F-Statistics	1%		2.5%		5%		K= 5
		I(0) LCB	I(1) UCB	I(0) LCB	I(1) UCB	I(0) LCB	I(1) UCB	The Decision
Log(VT)=f(Log(COR_P), Log(COR_N), Log(FI), IR, GGDP)	4.599473	3.41	4.68	2.96	4.18	2.62	3.97	Co-integration

As shown in tables (6) and (7), the results support the hypothesis that all variables in ARDL and NARDL models are co-integrated at 5% level of significance.

Estimation of Long Run Elasticities:

The existence of co-integration relationship implies the existence of a long run relationship among the variables. The results of equation estimation for ARDL and NARDL models are given in table (8).

Table (8): Estimation of Long-Run Coefficients for ARDL and NARDL Models

Dependent Variable: Log (VT)

Variable	ARDL Model	NARDL Model
	Coefficient [Probability of T-Ratio]	Coefficient [Probability of T-Ratio]
Log (COR_P)	-	-4.33 [0.16]
Log (COR_N)	-	-6.12 [0.08]
Log (COR)	- 2.638 [0.10]	-
Log (FI)	0.913 [0.00]	0.29 [.58]
GGDP	21.500 [0.00]	23.89 [0.02]
IR	-4.750 [0.08]	-9.82 [0.08]
Intercept	9.720 [0.18]	4.29 [0.31]

As table (8) reveals, the estimated coefficients of the long-run relationship in ARDL model are all statistically significant at 10% level or less, except the intercept. The signs of the estimated coefficients of the independent variables are in line with the economic theory. The corruption elasticity is significantat 10% level, and its sign is negative, which implies that a 1% increase in corruption leads to a 2.64% decrease in the volume of trade, this negative impact agrees with some previous studies (see Yartey, 2010; Abdul-Qadir&Yaroson, 2013; and Ayaydin&Baltaci, 2013). The elasticity of foreign indirect investment in ASE is significant at 1% level, and its sign is positive, thus a 1% increase in foreign investment leads to a 0.91% increase in the volume of trade, this positive influence agrees with the results of Abubakar&Danladi, (2018). Also, the economic growth coefficientis significant at 1% level, and its sign is positive implies that the increase in the growth of GDP by one unit (1%) leads to an

ISSN- 2394-5125 VOL 8, ISSUE 02, 2021

increase by 21.5% in the volume of trade. This result also agrees with the result of Shula (2017). Finally; real interest rate impact is significant at 8%, and its sign is negative, which implies an increase in IR by one unit (1%) lead to a decrease in the volume of trade by 4.8% and this result is in line with the economic theory. And for the NARDL model the results shows that positive changes in corruption adversely affect the performance of the ASE, where the sign of its coefficient is negative, which implies that an increase in corruption by 1% leads to a decrease by 4.33% in the volume of trade, and this result is in line with the economic theory, and support the ARDL results above, but it should be noted that it is statistically insignificant, where the level of significance is 16%. And a negative change in corruption affects positively in the performance of ASE, where the sign of its coefficient is negative, which implies that a decrease in corruption by 1% leads to increase by 6.12% in the volume of trade, and it is statically significant at 8%, also this result is in line with the economic theory,and consistent with the results of ARDL above. This indicates that the impact of the negative change in corruption is greater than the impact of the positive change of corruption. The elasticity of foreign indirect investment in ASE is positive, and statically insignificant, thus a 1% increase in foreign investment leads to a 0.29% increase in the volume of trade, this positive influence agrees with the results of Abubakar&Danladi, (2018). Also, the economic growth rate coefficientis significant at 2% level, and its sign is positive implies that the increase in the growth rate of GDP by one unit (1%) leads to an increase 23.89% in the volume of trade. This result also agrees with the result of Shula (2017). Finally, real interest rate impact is significant at 8%, and its sign is negative, which implies that an increase in IR by one unit (1%) lead to a decrease in the volume of trade by 9.82% and this result is in line with the economic theory. The effects of (Log (FI), GGDP, and IR) are consistent with the results of ARDL model.

Estimation of Short Run Elasticities for the ARDL and NARDL:

Table (9) presents the results for Error Correction Model (ECM)

Table (9): Vector Error Correction Model

Model	Regressors	Coefficient	Standard Error	T-Ratio [Probability]
ARDL	ECM(-1)	-0.88	0.0693	-12.72[0.00]
NARDL	ECM(-1)	-0.70	0.179	-3.92[0.00]

From the result of table (9), the equilibrium correction coefficient of lagged error correction term ECM(-1) for ARDL model is estimated to be (-0.88) and for NARDL is estimated to be (-0.70) , both of them is highly significant (1% level) and has the correct sign (negative). This shows that the system in ARDL and NARDL models corrects its last period disequilibrium (the speed of adjustment to restore equilibrium in the dynamic model) by approximately 88% a year in ARDL model and 70% a year in NARDL model which may be considered a fairly high speed of adjustment to equilibrium after a shock. The highly significant error correction term confirms the existence of long-run relationship in both models.

Diagnostic Tests:

To make the results more robust, some diagnostics tests are applied to test both models specification. As shown in table (10), the diagnostic tests show that the models passed successfully tests of serial correlation, and heteroscedasticity. The empirical evidence shows that no serial correlation exists, and there is no heteroscedasticity problem because the probabilities of all tests are higher than 10% significance level.

Table (10): Diagnostic Tests for ARDL Model and NARDL Model

Model	Equation	Test	Test- Statistics	Prob.
ARDL	Log(VT) = f(Log(COR), Log(FI), GGDP, IR)	Serial Correlation test	F -statistics = 0.25	Prob. F(2,10) = 0.78
		Heteroscedasticity test	F -statistics = 0.75	Prob. F(6,12) = 0.62
NARDL	Log(VT) = f(Log(COR_P), Log(COR_N), Log(FI), GGDP, IR)	Serial Correlation test	F -statistics = 3.23	Prob. F(2,6) = 0.11
		Heteroscedasticity test	F -statistics = 1.49	Prob. F(9,8) = 0.29

ISSN- 2394-5125 VOL 8, ISSUE 02, 2021

CUSUM and CUSUM Square Stability Test

According to CUSUM and CUSUM Square test for the stability of the parameters over the whole period of time, as shown in figure (2), (3),(4), and (5). Clearly, the variables in ARDL model and NARDL model have high degree of stability at 5% level of significance. So, there is no need to divide the study period (1998-2017) into sub-periods, which implies that the estimation results for the whole period of study are appropriate.

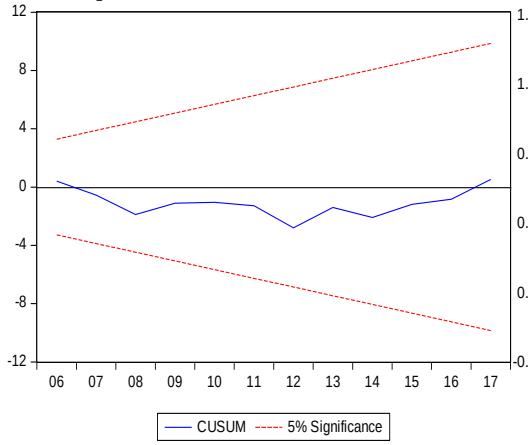

Figure (2): Cusum Test for ARDL

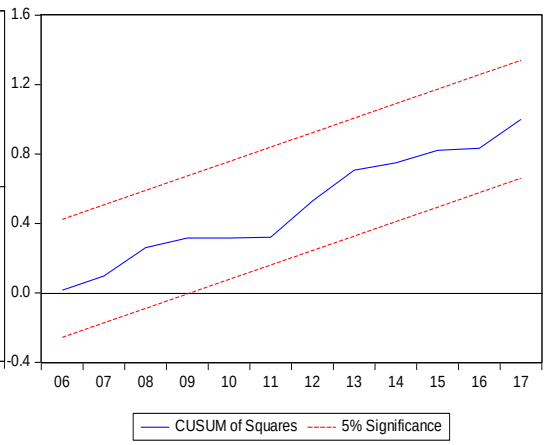

Figure (3): Cusum of Squares for ARDL

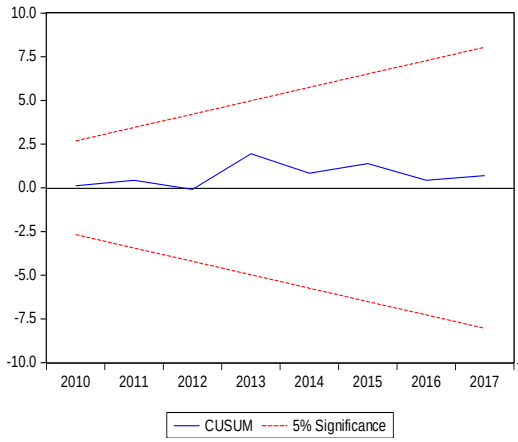

Figure (4): Cusum Test for NARDL

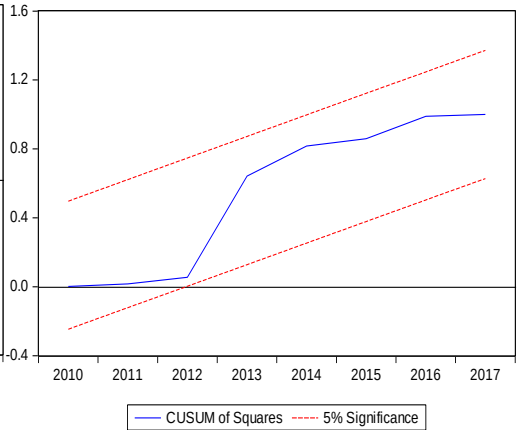

Figure (5): Cusum of Squares for NARDL

Conclusion:

This study aims to investigate the short and long run impacts of corruption on the performance of the ASE. Both Autoregressive Distributed Lag (ARDL) bounds testing approach of co-integration and Nonlinear Autoregressive Distributed Lag (NARDL) are employed to examine the linear and nonlinear relationships between corruption and the performance of ASE, the results shows that the corruption is negatively affect the volume of trade, and therefore confirms the view of many previous studies (see Yartey, 2010; Abdul-Qadir&Yaroson, 2013; and Ayaydin&Baltaci, 2013).

According to the previous results, the Jordanian Government should work on anti-corruption in order to improve the volume of trade in the ASE by enact the anti-corruption laws, and ensure their strict implementation without exceptions.And enact the electronic government to obtain and approve transactions electronically, to facilitate and simplify procedures.Making Easier investment proceduresin order to decrease the amount of corruption, thus to improve the performance of ASE. Encouraging foreign investments and facilitating their procedures to attract more foreign investors, and thus to enhance the performance of the ASE.

References:

- Abdul-Qadir, Ahmad and Yaroson, Emilia (2013).” Does Corruption Matter in The Development of The Stock Market in Nigeria?”, Journal of Accountancy, Vol.4, No.1, p: 1–20.
- Abubakar, Mika and Danladi, Yunusa (2018). “Foreign Direct Investment and Stock Market Development in Nigeria: Evidence from Ardl Bound Test Approach to Cointegration”. IOSR Journal of Economics and Finance (IOSR-JEF), Volume 9, Issue 1, P: 79-85.
- Ahmad, Naved and Ali, Shahid (2010). “Corruption and Financial Sector Performance: A Cross-Country Analysis”, Economics Bulletin, Vol. 30, No. 1, p: 303-308.
- Aljarrah, Mohammed A. (2010), “Budget Deficits and the Behavior of the Real Exchange Rate: The Case of Saudi Riyal”. Journal of King Saud University (Administrative Sciences) King Saud University. Riyadh, Kingdom of Saudi Arabia, 1(21).
- Aljazaerli, Moaz and Sirop, Rasha, and Mouselli, Sulaiman (2016). “Corruption and Stock Market Development: New Evidence from GCC Countries”, Verslas: Teorijairpraktika / Business: Theory and Practice, Vol. 17 (2), p:117-127.
- Al-Qudah, Ali Tayseer (2016). “The Impact of Economic Globalization on Performance of Amman Stock Exchange (Jordan): An Econometric Study”, Unpublished Master Thesis, Department of Economics, Yarmouk University, Irbid, Jordan.
- AlRabba’, Mohammad and Malawi, Ahmad Ibrahim (2016). “The Impact of Inflation and Financial Crisis on Stock’s Price in Amman Stock Exchange: UVAR Model”, Al-Manara for Research and Studies, Al al-BaytUnivestity, Almafraq, Jordan, Vol. 22, No. 3/B.
- Al-Sheyab, Raef (2018). “Nine Obstacles in the stock market”. Al-Ghad News Paper. Available on : https://alghad.com/%D8%AA%D8%B3%D8%B9%D8%B9%D8%AC%D8%A7%D9%81-%D9%81%D9%8A-%D8%A8%D9%88%D8%B1%D8%B5%D8%A9-%D8%B9%D9%85%D8%A7%D9%86/
- Al-Smadi, Sahab and Malawi, Ahmad (2016). “The Impact of Taxes on the Performance of Amman Stock Exchange: Autoregressive Distributed Lag (ARDL) Approach”, Al-Manara for Research and Studies, Al al-BaytUnivestity, Mafraq, Jordan, Vol. 22, No. 2.
- Amman Stock Exchange. (2017), Yearly Data, Available on:https://www.ase.com.jo/
- Ayaydın, Hasan and Baltac, Nuri (2013). “Corruption, Banking Sector, and Stock Market Development: A Panel Data Analysis”, European Journal of Research on Education, International Association of Social Science Research- IASSR. Special Issue: Human Resource Management, p: 94-99.
- Bani-Hani, Mohammad Tayseer (2017). “The Impact of Financial Liberalization on the Volume of Trade in Amman Stock Exchange (Jordan)”, Unpublished Master Thesis, Department of Economics, Yarmouk University, Irbid, Jordan.
- Bencivenga, Valerie R. and Smith, Bruce D. and Starr, Ross M. (1996). “Liquidity of Secondary Capital Markets: Allocative Efficiency and the Maturity Composition of the Capital Stock”, Economic Theory, Vol. 7, No. 1, p: 19-50.
- Bolgorian, Meysam (2011). “Corruption and Stock Market Development: A Quantitative Approach”, Physica A: Statistical Mechanics and its Applications, Vol. 390, Issues. 23-24, p: 4514-4521.
- Central Bank of Jordan. (2018), Yearly Data, Available on: http://www.cbj.gov.jo/
- Demir, AyseUlkuhan (2015). “Three Essays on the Nonlinear Dynamics of the Financial Growth Nexus”, Master’s Thesis, Department of Economics, Univ. of Leicester, UK.
- Fosu, Oteng-Abayie Eric and Magnus, Frimpong Joseph (2006), "Bounds Testing Approach to Co-integration: An Examination of Foreign Direct Investment, Trade, and Growth Relationships", American Journal of Applied Sciences 3 (11), P: 2079-2085.
- Granger, Clive W.J. and Yoon, Gawon (2002). “Hidden Co-integration”, Economics Working Paper, University of California, No.2002-02
- Habib, M and Zurawicki, L. (2002), “Corruption and Foreign Direct Investment”, Journal of International Business Studies, Vol. 33, Issue. 2, p: 291-307.
- Harris, R. and Sollis, R. (2003), “Applied Time Series Modeling and Forecasting”. Wiley, West Sussex.
- Hearn, B. and Piesse, J. (2009). “Barriers to the Development of Stock Markets: A Case Study of Swaziland and Mozambique”, Journal of International Development, Vol. 22, No. 7, p: 1018-1037
- Jain, Pankaja k. and Emre, Kuvvet and Pagano, Michael S. (2012). “Corruption’s Impact on Liquidity, Investment Flows, and Cost of Capital”. Available online: https://www.lehigh.edu/~jms408/pagano_2012.pdf

- Lau, C. K. M.; Demir, E.; Bilgin, M. H. (2013). "Experience-Based Corporate Corruption and Stock Market Volatility: Evidence from Emerging Markets", Emerging Markets Review, Vol. 17, p: 1–13.
- Munhoz, Carolina PancottoBohere (2008). "Corruption in the Eyes of the World Bank: Implications for Institution's Polices and Developing Countries", Penn State International Law Review, Vol. 26, No. 3.
- Pesaran, H., Shin, Y., and Smith, R. (2001), Bounds Testing Approaches to the Analysis of Level Relationship. Journal of Applied Econometrics, Vol.16, P: 289-326.
- Pesaran, M. and Pasaran, B. (1997), Working with Microfit 4.0: Interactive Econometric Analysis, Oxford University Press, Oxford.
- Pinheiro, A. R. D. C. (2010). "Does Corruption Drive the Stock Market?", Master's thesis. Universidade Nova de Lisboa. Portugal.
- Shahbaz, M. and Hye, Q. M. A. and Shabbir, M. S. (2013). "Does Corruption Increase Financial Development? A Time Series Analysis in Pakistan", International Journal of Economics and Empirical Research, Vol. 1, No. 10, p: 113–124.
- Shin, Y., Yu, B. and Greenwood-Nimmo, M. (2014). "Modelling asymmetric cointegration and dynamic multipliers in a nonlinear ARDL framework", in Anonymous Festschrift in Honor of Peter Schmidt. Springer, pp. 281-314.
- Shula, Kampamba (2017). "The Impact of GDP, Inflation, Interest and Exchange rates GDP on the Stock Market in Zambia". Available online: https://www.researchgate.net/publication/315639663_The_Impact_of_GDP_Inflation_Interest_and_Exchange_rates_GDP_on_the_Stock_Market_in_Zambia
- Transparency International. (2017), Yearly Data, Available on: https://www.transparency.org/research/cpi
- World Bank of Jordan.(2018), Yearly Data, Available on:https://www.worldbank.org/en/country/jordan
- Yartey, Charles Amo (2010). "The Institutional and Macroeconomic Determinants of Stock Market Development in Emerging Economies", Applied Financial Economics, Vol. 20, No. 21, P: 1615-1625.