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RESEARCH ARTICLE

THE IMPACT OF STOCK MARKET VOLATILITY ON ECONOMIC GROWTH (JORDAN'S CASE)

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ABSTRACT

Developing countries' financial markets have witnessed several unexpected fluctuations over the previous twenty years. Such fluctuations had caused a serious impact on these markets and have caused financial turmoil that had reached the uncertainty point in the region. Due to this effect, stakeholders should work to absorb these effects and work to document them for future reference. Jordan was among the countries which were affected by these factors and thus has been selected as a case for providing an empirical vision. This paper analyzed Jordan's stock market (ASE) during periods of high volatility. And highlighted the volatility effect of efficiency and consequent outcomes in this market. This study has examined the volatility impact of Jordan's Stock Exchange (ASE) on the country's growth during 2004-2018 using GARSH and ARSH tests. The study results pointed out that sudden and continuous fluctuations in the shares prices for ASE are the major causes which distorted Jordan's economic growth. In light of this result, researchers recommend that in a bid to prevent ASE continuous vibrations in the stocks prices, employment volume, professionals' quality levels, and craftsmen should be strengthened.

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INTRODUCTION

The prime reason which affects the growth level of most Developing economies is their inability to cope with the continuous successive developments in the international financial markets. It is vital to indicate that financial markets incorporate an important role in economic growth and development by making savings more able to be transferred from savers to investors. However, the problem of instability and progress of the financial sector have passively affected the financial market development. That the inability to adjust the data of the financial markets would prevent the smooth functioning of the financial system and adversely affect the economic the country's economic development. The imperfect vibration in the growth of stock market index distorts investors ability to sort out strong and viable corporates (Abugri, 2008). Previous studies showed that issues of stock market volatility and economic growth are debatable and and controversial among scientists and have given mixed results. So, more research is needed on financial markets volatility. It worth to note that many studies have failed to design a mathematical or financial model to represent stock market instability. It is hypothesized that the variability of stock market indices would cause the growth of these markets. It is worth to indicatethat many literary studies about stock market volatility and economic growth are controversial among many researchers as many research results were still mixed (Ejvan Pettinger, 2012). Engel (1982) had proposed a model to measurethe fluctuations and their effect on economic growth. It is worth to indicate that despite the many studies pertaining stock market volatility and its effect on the economic growth of many developed markets, however, these studies on the level of developing markets were few.

Literature: Stock market efficiency is an essential feature for the economic development of any country. It is the most important financial indicator which draws the eagerness of researchers on the effect of financial markets on the economy and if there is a relation between the viability of the financial market and economic development. Many studies have focused on the effect of stock market volatility on macroeconomic development. The outcomes of most studies conducted were controversial. One view revealed that volatility of the stock market has a positive impact on economic growth (Ahmad and Samad (2008), even thou, there is still doubt about its contribution and its effect on long-term economic growth and consequently have passive effect on the country's economy (Adjasi and Biekepe, 2006). Stock market volatility effect on economic growth has received considerable attention by many researchers, and this research is considered as insufficient to prove the relationship between the volatility of the stock market of undeveloped countries' economic growth, including Jordan. Kempel and others have proposed that stock market's volatility has a significant predictive relationship to real GDP growth of countries. While Joe proposed that this relationship is not quite strong to deserve the specifications of developing a model, on the contrary, it is a passive relationship (Barro, 1995). I-1-Stock market volatility and performance: There is a significant correlation between stock volatility and stock market performance, if the volatility tends to fall, it will be accompanied by a rise in the stock market index and vice versa. As the rate of volatility increases, it leads to an increase in the market risk and this leads to a drop in the market return. Market volatility risk of can be figured out by the dispersion rates of returns around their average. The greater the returns dispersion around the average, the less the total returns (Nzomo, 2017).

Stock price volatility key factors

Basic economic factors

Revenues and common stock dividends: the dividends rates distributed to ordinary shareholders where companies follow different net profit distribution policies at the financial year end, where most companies hold part of the realized profits as reserves for capital investment or for distributions once there are no realized profits in the coming years (Carol Alexander, 2009). While, common stock holders prefer to receive the dividends at the end of each year, albeit non-cash, i.e. free shares. Dividends rates usually have a mixed effect, both appreciative and depreciative, on the market value of shares, but the depreciative impact outweighs the appreciative impact, as investors get confused about their future expected earnings.
The attitude of change in the volume of dividends distributed to shareholders usually has anagrapha tic effect on forecasting the stocks future prices and a vital indicator in the survey of the country's economic status (Corradi, 2001).

Interest rates: These are types of systemic risk, but the researcher thinks that it is better to separate this factor and conduct a separate study by considering this variable as an independent out of the other systematic risks in general due to its significant adverse impact on the prices of shares traded. It is well known that when interest rates get high, investors would be interested to place their money as bank deposits to get profits due to the rise of interest rates. For this reason, some are willing to sell their shares to obtain the necessary cash which causes an increase on the stock supply, which leads to a reduction on the stocks market price (Crestmont, 2011). Conversely, lower interest rates lead to increased liquidity and thus an increase in capital flows in the stock market in anticipation of higher rate of return to compensate for low interest rates in banks. Bank interest is the liability of working capital for most companies and thus any interest rate increase will lower their net profits, which consequently depreciate the dividends (Daferighe, Emmanuel).

Inflation rates: incremental on goods and services prices will decrease the purchasing power of the country's currency unit. This falling rate is commensurate with inflation rate. Central banks are trying to stem the steep of inflation rates and deflationary rates, in a bid to keep the excessive price growth and turn to minimum levels. Many researchers have indicated the negative relation between inflation levels and real GDP growth levels (Elton, 1999).

Index of price consumption: it is the consumer weighted average basket price of basic goods and real services, namely: transportation, food and medical care. This index is calculated by calculating price changes for each item in a certain basket of goods and their average price. This indicator is used to evaluate the changes in the consumer basic items prices in a bid to evaluate the variables linked with living costs.

Non-economic factors: A-Stock Market Stability is subjected to the shocks that could threaten economic stability and future growth. Thus, they tend to fall on negative news such as terrorist attacks or high oil prices. They are also affected by political instability that may make it difficult to pursue strong economic policies.

Confidence and forecasts are key factors of investors' mood and behavior. If economic news gives optimism and confidence, this leads to more stock buying. While the opposite news will lead the stock holders to sell. In the midst of recessions, investors can start buying stocks as they predict their rise. Investors are always trying to forecast the future prices. However, if investors realize that prices are stagnant or stock market meltdown is over, speculators can buy stocks even when economic indicators remain low.

Bandwagon Effect: Sometimes the stock market is over reacted to certain events. For example, in 1987, extreme passive news in the stock market caused only a 25% decline. While today there is real mystery why the stock market has fallen so much as there was no economic problem. Part of the situation is that people usually follow the mood. So when prices fall some people are encouraged to follow the herd and step out of the market.

Relevant markets: Quite often, Financial speculators could have some alternative options, which means that instead of investing in the equity market, they can buy treasury securities or commodities. Once investors feel that government securities become relatively tight and their prices intend to fall, this supports the equity market as investors will go to them (18). It is quite difficult to develop relationships that might be studied to show this set of causes that play an effect to the volatility of security markets. Consequently, this research was limited to showing the effect of Macroeconomic causes and their effect on the volatility of these markets.

Previous studies: 1-Study by: Ghassan Omat and Gamal Khasawneh (2002) entitled: "Stability of the Policy of Dividend Distribution and the Effect of Dividends on Share Prices". This study dealt with the policies of distributing profits by non-financial companies listed Jordan's ASE (1991-1998). Outcomes revealed that dividends and stock prices are strong related. This result is reached by studying a sample of 26 Jordanian non-financial companies consisting of (26) companies by computing simple and multiple regression coefficients of dividends and Stock prices. Results were meaningful and have explanatory power for stocks prices (11).

Study by: Xiufang Wang, September 2010, titled : The effect of Stock Market Volatility on Macroeconomic Volatility: China case. Subject research analyzed common shares market volatility effect on the macroeconomic moving average volatility in China. Researcher had used the exponential general autoregressive test of the conditional heteroskedasticity and (LA-VAR) tests. Researcher realized that there is a consolidated relationship between inflation rates and common shares prices.

However, there was a monodirectional relation between the interest rates and common shares prices.

3**Study by:** Crestmont, 2011- titled – Market Common Shares Perforemance & Volatility; The study had introduced a supernatural relationship between market common shares performance and stock market volatility. Researcher had waived out any causal relationship to the coexisted fact that various risk measures accurately increase in declining markets. While, the risk compounds rewards significantly in strong markets. It is worth to conclude that in bull and bear markets, this relationship assures the need to consider risk and reward in investors' decisions.

Study by: Nzomo J. Dombou D. entitled: Effect of common market shares volatility on economic growth: cases of: Cameroon, Ivory Coast and Nigeria,

This research had examined

- The effect of common shares market return volatility on economic growth,
- How common shares market improvement can affect economic growth.

The tests used in this research are: Generalized Autoregressive Conditional Heteroscedasticity (GARCH) to understand return volatility and (Value at Risk) formula to stimulate any relation between common shares market and economic growth. Quarterly Time Series data set used for the period (2000 – 2015) for Nigeria and Ivory Coast, and the period (2008 – 2015) for Cameroon. The tests results were:

- DSX figures were not quite significant in affecting economic growth,
- The causality relation from common shares market growth to GDP in Ivory Coast and Nigeria was insignificant.
- Prime macroeconomic variables affecting (or affected by) common shares market are Inflation and Supply of Money.

Study by: Salameh M. and Al zubi B., 2018Titled: Enquiry on Dubaicommon shares market volatility: Research objective is to evaluate Dubai Financial Market Index volatility shocks, whether they are from inside the market of historical shocks as one alternative, or if they are outside shocks (FSTE andS&P500) on the other. Daily data series were collected for the period:

(01, 2014- 12, 2015) and (GARCH) test was conducted. Findings–Empirically, Researchers found that Dubai Financial Market present volatility Index is majorly dependent on inside shocks and partly on outside shocks; such as, S&P500. 6-Wanyama,D, 2017: Effect of stock market volatility on the growth of corporate bond market in Kenya. The objective of this research was to test the effect of shares market volatility on Kenya's corporate bond market development. The researcher used the descriptive and statistical testing forms. The study sample was a set of daily and monthly time series for the period (2009 -2014). Statistical tests included the Augmented Dickey-Fuller (ADF) and Phillips-Perron tests. The researcher used econometric software of Eviews to facilitate the data's empirical analysis. Research outcomes showed that the shares market volatility and company's bonds were positive and significant (r=0.000023, p=0.0001). The researcher recommended that corporate policy makers should consider the level of shares' market volatility that is convenient for upgrading the growth rate of equity and bonds markets.

Study Model: The researchers used the following tests: 1-heteroscedasticity: In theory, transverse data is often combined with multiple heterogeneity testing. 2-homoscedasticity as time series tests are implemented for monoclonal studies. The researcher, Engel, had found from macroeconomic data analyzed that the deviation of the asymmetries in the sets of time models was less consistent than expected for some data. In his opinion, this is caused by the uncertainty of the forecasted returns of the stocks over the three periods of variance and covariance Which are evaluated by contrast and heterogeneity tests. Collective stock price volatility also refers to observations and monitoring as that has been traced in the Mandelbrot test (1963). "Large changes in volatility are accompanied by large macroeconomic deviations, either positive or negative, and small variations in volatility tend to be followed by small changes in deviation. A quantity figure of this truth is that as the proceeds themselves are invariably unconnected to the revenuesrt | and its squares which are displayed positively, and are meaningful to slow the function of self-correlation ranging between several minutes to several weeks.

The autoregressive conditional heteroskedasticity form always takes above average volatility into consideration which became one of the highest frequently used tools to describe contrast and volatility (Fama, 1977). Bollersley (1986) developed the autoregressive conditional heteroskedasticity form to the generalized GARCH. The generalized GARCH reveals that smaller variables can represent larger ones that the ARCH model takes. It is usually argued that volatility fluctuates during depression periods and decreases during periods of intensification and high growth. Anyway, not the ARCH or the GARCH forms can trace this disparity or imbalance in economic growth. Nelson's EGARCH model (1991) can show the variability in stock price fluctuations with the true growth trend.

EGARCH model:

$\text{Log } б_t^2 = ų + \sum_{i=1}^{p} (\lambda_{iIZt-I} I + Q_i\ Z_{t-I}) + \Sigma^{q}{}_{I-1}\ \beta \log б^2{}_{t-I}$ (1) , Where:

$Z_t = ų_t / б_t$, $ų_t$is the error figure,

$\mathbf{Z_t}$: Conditional variation logarithm,

The active and passive effects of asymmetry of shocks aregiven by the mathematical limit:

Zt-1, if :$\mathbf{0 > Q_i > 0}$, the volatility increases and decreases when the following shock is left plus or minus.

$Z_{t-i} = ų_{t-i} / б_{t-i,}$ The firmness of shocks to conditional variation can be represented by: ∑^qi =1 βi

For certain cases, EGARCH form is as follows:

$$\text{Log } б^2{}_t = ų + \lambda I Z_{t-i} I + Q Z_{t-I} + \beta_i \log б^2{}_{t-1}$$

At positive shock, the equation becomes:

$$\text{Log } ϭ^2_t = ų + (λ + Q_i) Z_{t-i} + β_i \log ϭ^2_{t-1}$$

At negative shock, the equation becomes:

$$\text{Log } ϭ^2_t = ų + (λ – Q_i) Z_{t-I} + β_i \log ϭ^2_{t-1}$$

The effect is proved by testing the null hypothesis: $_{Ho}$, ie, Q = 0, and the effect is misleading if Q is not zero.

Benefits of using E-GARCH model: 1-Since the variability figure is clear, there shall be no need to postulate positive constraints on the variance variables. 2-The exponential generalized autoregressive conditional heteroscedastic (EGARCH) model can take into account the varying volatility effect. Only GARCH coefficients control the continued volatility of shocks. It is used to estimate stock market volatility and economic growth. EGARCH test provides an empirical proof of unequal relations between Common shares market volatility and economic development. In this research, the researcher had used the annual data sets for the period 1992-2013: The share price index was used, from which the annual return of the Jordanian stock market was derived from real GDP and the CPI as a measure of economic activity. The economic inflation coefficient and the Central Bank interest rates, which exercise the economic activity of the stock market for the same period, were also used. Using the data mentioned above, the two-step study was carried out to examine the relationship between the volatility of the stock market and the volatility of economic growth. The first is to estimate the oscillation of each variable using the AR-EGARCH model. This is followed by some qualitative statistics of the used variables. The research gave an estimate of the single-time series to indicate the variations in the time series to allow time variables for both Conditional average and variance. In this regard, the two researchers aimed to elaborate the relation between interest rate volatility (the discount percentage of the Central Bank of Jordan), GDP growth, shares percentage inflation rates, and ASE shares profits via using the most acceptable method.

Study problems and hypotheses:

The problem of the study problem is defined as the significant effect of the volatility of the ASE index Jordanian's net GDP. Therefore, the study is designed to answer the questions:

- Is there a significant effect of the volatility of the ASE index on Jordanian's GDP development?
- Does volatility of Jordan's ASE have a significant effect of the Banks' interest rates?
- Does the volatility of the ASE on EPS growth rates?
- Does volatility of Jordan's ASE have a significant effect on inflation? Is there a subjective correlation to the standard error values for all study variables?
- Based on these questions, the following research hypotheses are Spouted:

Ho1: The volatility of the Amman Financial Market has no effect on the growth of GDP at a significance ratio of x <0.05.

Ho2: The fluctuation of the Amman Financial Market has no effect on the change in bank interest rate on the significance ratio x <0.05.

Ho3: The volatility of the Amman Financial Market does not have an impact on EPS growth at a significance ratio of x <0.05.

Ho4: The volatility of the Amman Financial Market has no effect on the change in the inflation rate on the significance of x <0.05.

Ho5: There is no intrinsic correlation to the standard error values for all study variables on the significance ratio x <0.05.

STUDY RESULTS

GED is an error distribution factor: The Table 1 outcomes showed the estimated parameters and the standard error in each of them. It indicates that the GARCH coefficient, which is denoted by (β) at the GDP, is equal to (0.788) and (-0.460). The value of (β) at INT IS (0.421) and (0.592). At stock mean return(IR), the rate is 0.254 and -0.044, and mean inflation rate (INF) is 0.116. Table 1 reveals that all the values mentioned are insignificant. Since the parameter (β) measures the continuity of stock price volatility index in spite of the events in the stock market, and since its values are below 0.9, and insignificant, it shows that the volatility stands for a glance of time to fade and its effect vanishes. (Alexander, 2009).

The coefficients of the self-regression coefficient (α) at GDP were: 2.357, 1.179, 1.558, -1.246, and 0.836. The value of α at the interest rate INT is equal to 2.663 and -0.387). When the stock mean return (IR) coefficient is (-0.291) and (-0.166), and the inflation rate (INF) is (-0.484) and (-0.932), all of these values are not significant. Since α values refer to the symmetric effect, values greater than 0.1 are an indication that volatility is affected by full-time market events. On the other hand, the increase in α indicates an increase in the sensitivity of the price index at bad times. The parity coefficient value (Y) at GDP is (-0.460), at the interest rate (INT) of (-0.698) and (-0.039), and when the stock mean return (IR) factor is equal to (2.071) and (0.318), inflation (INF) is (1.274) and (1.229), and all values are not significant. (Y1) means that the model is symmetrical, whereas in the case of Y2 <0, the positive shock (good news) will generate less volatility than the negative shock (the bad news) In the case of Y2 <0, the positive shock (good news) will generate more volatility than the negative shock (the bad news). Since all values in the three parameters are insignificant, we cannot determine the validity of the information content of these values.

Table 2 indicates the possibility of accepting the null hypothesis because there is no intrinsic correlation for the standard error values for all study variables, based on O * R2 values. It was also accepted that there was no effect of self-regression on the residuals, as the Chi-square value obtained by Lagrange Multiplier test (LM). Based on these tests in each AR-EGARCH model, we can claim the validity of the selected model Time series data for each variable. Table 3 reflects the inflation rate effects as they showed a clear fluctuation in relation with the other variables. The torsion value showed positive and the flour value was more 2 as it has reached 6.292. Figures of time series of the inflation values were distributed abnormally as to Jarque-Bera test Which showed a significant test value lower than 1%. The table also shows the interest rate followed by inflation.

Table 1. Results of EGARCH analysis

	GDP	INT	IR	INF
Model	AR(5)-EGARCH(1,2)	AR(2)-EGARCH(2,2)	AR(2)-EGARCH(2,2)	AR(2)-EGARCH(1,2)
		Mean Equation		
GARCH	0.199(2.21)	-0.106(1.324)	-0.494(0.976)	-0.970(0.049)**
χ0	0.011(0.029)	0.001(0.001)	0.007(0.008)	0.017(0.005)**
χ1	0.407(0.940)	1.134(0.869)	1.705(1.409)	1.262(0.343)**
χ2	0.017(0.931)	1.044(2.547)	-0.013(3.537)	0.532(0.465)
χ3	0.115(0.544)			
χ4	-0.091(0.654)			
χ5	-0.122(0.423)			
		Variance Equation		
Ω	-2.790(6.105)	-1.569(4.268)	-2.767(7.946)	-2.012(6.399)
α1	2.357(2.500)	2.663(1.807)	-0.291(6.618)	-0.484(1.285)
α2	-1.179(4.201)	-0.387(2.792)	-0.166(4.171)	-0.932(4.898)
α3	1.558(4.058)			
α4	-1.246(3.048)			
α5	0.836(3.390)			
β1	0.788(0.911)	0.421(0.981)	0.254(3.174)	0.116(1.128)
β2	-0.460(2.415)	0.592(0.762)	-0.044(1.772)	
ϒ1	-0.460(2.016)	-0.698(0.958)	2.071(6.097)	1.274(0.986)
ϒ2		-0.039(1.409)	0.318(6.689)	1.229(2.540)

Notes:
1.Numbers in parentheses refer to the standard error.
2. (**), (*)Function value at significance levels (1%), (5%).

Table 2. Test fitting model E GARCH

	GDP	INT	IR	INF
Model	AR(5)-E-GARCH(1,2)	AR(2)-EGARCH(2,2)	AR(2)-EGARCH(2,2)	AR(2)-EGARCH(1,2)
		Diagnostic		
GED	0.663(0.394)	1.146(0.923)	1.087(1.368)	0.671(0.315)*
O*R2	0.336	0.016	1.476	0.167
LM	0.309	0.015	1.436	0.153
AIC	0.003	0.010	-0.113	-0.450
SIC	-0.414	0.456	0.333	-0.522

Table 3. Research variables

	GDP	INT	IR	INF
Mean	3.747	6.375	0.066	3.839
Std. Deviation	0.145	1.951	0.443	3.262
Skewness	0.084	-0.258	0.723	1.237
Kurtosis	1.561	1.745	5.320	6.292
Jarque-Bera	1.924	15.541	6.850	15.541
p-value	0.382	0.000	0.033	0.000

Based on the standard deviation, the variables did not follow the normal distribution except GDP.

STUDY RESULTS: The following results are obtained from the study:

- The degree of impact of the volatility of stock prices on the economic factors were varying, some of which affect significantly, while others are of little or no effect.
  The volatility of stock prices does not affect GDP alone but collectively with other factors.
- Depending on the tests performed on each AR-EGARCH model, we can claim the validity of the model according to pretended time data for every variable. However, since the values of concerned parameters are insignificant, we cannot determine the information validity content of these values.
- As the research was limited to study the effect of ASE shares price variationson Jordan's economy, however, certain factors were not included in the study although they may affect the economic growth at different rates, these factors are:
- Country financial policies, such as taxes and government spending.
- Monetary policies such as mandatory money reserve ratios and discount rates.

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