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Causal Relationship between Market Growth and Economic Growth. Comparison Study

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Abstract

The present study aims to test the causal relationship between the economic growth and the market growth in three different countries with different market characteristics: the USA, Malaysia and Jordan for the period from 1994 to 2010. The results showed that the growth of market returns in Jordan does not affect the economic growth and vice versa. However, the growth of market returns in Malaysia has an influence on the economic growth, but not vice versa. The USA results, in contrast, showed that the growth of market returns affects the economic growth and vice versa. The results support the researcher assumption that the causal relationship between the economic growth and the market growth affected by the circumstances of each country.

Keywords: market growth, economic growth, market return, GDP, causality test.

Introduction

The importance of the stock market has inspired theoretical and empirical studies focusing on the relationship between financial development and economic growth (Arestis, Demetriades, & Luintel, 2001). The emphasis has been increased to stock market indices as a result of the important role it plays in the economic development (Demirgüç-Kunt & Levine, 1996).

The main objective of this study is to emphasize the instability of the relationship between the economic conditions and the market condition. Where the direct relationship is was assumed in many studies. The study tried to prove that the circumstances of each country affected on this relationship. Although there are some studies that have examined the relationship between market and economic conditions uses the simple regression models, but this study is one of the first studies that tested the this relationship by using Pairwise Granger Causality for different countries with different market characteristics.

The stock markets provide a significant financial instrument which helps the investors   decrease the cost and the risk of investment by diversifying their portfolios. Moreover, the well- developed stock market efficiently allocates capital to productive investments and leads to an increase in the economic growth (Caporale, Howells, & Soliman, 2004). It is believed that economic growth is good for stock returns as well as it helps forecast the stability of international asset allocation decisions (Ritter, 2005). Also, a liquid and a well-developed stock market helps investors diversify away unsystematic risk and increases the marginal productivity of capital (Pagano, 1993). Policy makers have to understand the relationship between economic growth and financial market performance in order to manage their economies effectively (Karunanayake, Valadkhani, & O'Brien, 2012).

An early investigation on the behavior of stock return has been done by Fama (1970). His theory of efficient market hypothesis proposes that stock markets are efficient as they reflect the fundamental news (macroeconomic variables). This implies that all relevant information in the market must be included in a financial mark. Chakravarty (2005) mentioned that the stock market prices are highly affected by the fundamental macroeconomic variables, which leads it to be one of the most critical components in the world economy.

Although much of the existing literature highlighted the importance of investigating the interaction between economic growth and market growth, Trew (2006) claimed that the relationship between financial market growth and economic growth have still not been fully investigated.

Literature Review

Fama (1990), Liu and Sinclair (2008) and Oskooe (2010) argued that the economic growth affects the firms' financial performance by affecting the expected earnings, share dividends and stock price fluctuations. According to Fama (1990) three reasons exist behind the strong relationship between stock market prices and economic growth: First, the stock market may reflect information about future real activity before it occurs; which gives it the ability to be a key indicator of the economic boom. Second, the discount rate changes, as a government policy, may affect both market growth and real economic growth. It is essential to note that the outcomes of economic growth are slower and do not appear immediately. Third, the change of stock market prices can affect the demand for consumption and investment goods (Schwert, 2012).

Diebold and Yilmaz (2008) found a unidirectional influence from the volatility of GDP to the volatility

of the stock market. Caporale and Spagnolo (2003) found a positive impact of the stock market volatility on output growth volatility. Mahdavi and Sohrabian (1991) argued that the market growth causes economic growth in the USA by using quarterly USA data during the period from 1960 to 1989.

Financial development has been observed to follow economic growth. For example, Nasseh and Strauss (2000) found that fundamental indicators had an impact on the stock market prices through their influences on the expected future cash flows. Similarly Chen, Roll, and Ross (1986) found that fundamental indicator fluctuations are significant effects on stock prices through their effect on future cash flows and discount rates. Moreover, Vazakidis and Adamopoulos (2009) focused on the relationship between market growth and economic growth in France for the period from 1965 to 2007 and confirmed that economic growth caused stock market growth in France.

In contrast, Filis and Leon (2008) have reported empirical evidence of a bi-directional relationship between stock market volatility and the volatility of GDP growth. They conceived that GDP shocks do not influence the stock market volatilities and stock market volatility may give rise to GDP volatilities. Arestis et al. (2001) showed that while banks and stock markets play a significant role in the growth process, banking sector development has a greater effect on the economic growth in the long run. Hongbin (2007) reported a bi-directional causality relationship between Chinese stock market growth and economic growth; noting that although the effect of the stock market is significant in the long-run, it tends to be limited in the short-run. Luintel and Khan (1999) studied ten developing countries and found a bi-directional causal effect between financial development and economic growth in the involved countries. Nieuwerburgh, Buelens, and Cuyvers (2006) studied the causality relationship between growth of GDP and stock market development and proved that increasing GDP leads to the development of the stock market. They also argued that the demand for financial instruments in stock markets is wanted for economic growth.

Levine (1991), Bencivenga and Smith (1991) confirmed that the liquidity of stock market plays a key role in economic growth by giving an individual opportunity to easily and readily liquidate these assets whenever they are desired. Rousseau and Wachtel (2000) studied 47 economies to test the relationship between financial market growth and economic growth. They found that extremely strong financial sector development leads to increased economic activity. Levine (2012) mentioned that the effects of public policies on economic growth can be measured by the decrease or increase in the stock exchange market prices.

Adjasi and Biekpe (2006) stated that stock markets help firms acquire capital easily and quickly due to the high liquidity in those markets. They also referred to the role of stock markets in guiding economic growth in the medium and the long-term. This is also agreed by Nasseh and Strauss (2000) who found evidence that stock prices reflect the expectations of the investors towards the direction of the economy in the future. Chakravarty (2005) used Indian monthly data from 1991 to 2005 and indicated that industrial production index and inflation both affected the stock market prices not vice versa.

On the other hand, some literature cited a negative relationship between economic growth and market growth. Diamond (1984) pointed out that the power of the stock markets can be unfavorable for economic growth as the bad effect on productive corporate takeovers. (Arellano & Bond, 1991) argued that growth of stock markets and development of banking sectors enhances economic growth significantly.

On the contrary, (Ram, 1999) found evidence of a negative relationship between financial growth and economic growth in developing and developed countries. Besides, (Dawson, 2003) found evidence from Central and East European countries that doubted the ability of financial market to stimulate the economic growth. Moreover, Mayer (1988), Stiglitz (1993), and (Singh, 1997) faulted the short-term of stock market focus of profits while ignoring the long-term investment which is the key factor of real growth. In another study, Bernanke and Kuttner (2005) concluded that the effect of monetary policy by changing interest rates did not affect the reaction of the market significantly. The absence of the financial system role in the economic growth has also been argued (Robinson, 1979). Oskooe (2010) studied the role of the Karachi Stock market in the economic growth in Pakistan. The study resulted in the absence of causality relationship between macroeconomic indicators and stock market prices. However, he reported that fundamental indicators cannot predict stock prices as well as stock prices do not reflect the real economic conditions in Pakistan. Thus, many economists give an extremely minor role, if any, to the stock market in the economic growth.

It has been found by (Thangavelu & Beng Jiunn, 2004) that financial markets and financial intermediary firms have inconsistent impacts on economic growth attributed to their roles in the domestic economy. Ehrmann and Fratzscher (2004) called for more studies to fully understand inconsistent responses from individual stocks in stock markets to some macroeconomic factors and fundamental news.

Based on the discussion above, the researchers have noticed that there is a lack of a clear relationship between market growth and economic growth. Such lack of previous literature has stimulated the researchers to discuss the given relationship in three different countries in the medium-term.

Data and Methodology

The present study precedes Pairwise Granger Causality Test by selecting three different countries with different market characteristics. They are: the U.S.A, which is a developed country, Malaysia, which is a developing country and Jordan, which is a third world country. The study used secondary data obtained from the international bank reports, while the data of stock market growth was obtained from the websites of the stock markets ASE and KLCI. The Dow Jones prices were obtained from Bloomberg website. The samples of the study are the annual observations for U.S.A, Malaysia and Jordan from 1994 to 2010. The time series data was obtained by the researchers from three main sources including; the market websites, Bloomberge website and the International Bank reports.

Unit root tests

If there is no fixed level for the price, the time series is called unit-root or non-stationary. ADF is determined for separate series in order to provide evidence that the variables are integrated or not. It is a version of the Dickey-Fuller test for a larger and more complicated set of time series models (Abushammala, 2011). Following the study of Ali, Rehman, Yilmaz, Khan, and Afzal (2010), this study involves additional lagged terms to ensure that the errors are uncorrelated.

The Pair wise Granger Causality Tests

The present study has applied a Granger causality test proposed by Granger (1969). The test stated that the variables can be used to predict each other if a causal relationship between them exists. In our case, the Granger causality test between market growth and economic growth has three possible results: first, unidirectional relationship in that market growth causes economic growth or vice versa. Second, the causal relationship is bidirectional. Third, there is no causal relationship.

In this study, data on these variables was collected over a period of 17 years from 1994 to 2010 and was subjected to econometric analysis to determine Granger causality by using bi-variate Vector Autoregressive (VAR) Models. (The variables data collected in this work was subjected to econometric analysis to determine Granger causality by use of bi-variate Vector Autoregressive (VAR) Models). To estimate the relationship between economic growth and stock market returns, this study applied the methodology of vector autoregressive model (VAR).

The autoregressive model concerns each variable as a dependent variable with an independent one as follows:

$V = f(MG, GDP)$ (1)

Where, MG is the stock market growth; GDP is the economic growth (gross domestic product).

In this study, the econometric investigation follows a multi-stage approach. After exploring the descriptive data for the research series, the researchers first performed some standard unit root and stationary tests by using the augmented Dickey-Fuller (ADF). This procedure is to make sure that the series is stationary in order to run the second stage, which investigates short-term interactions among the market growth and GDP growth under study.

The targeted series for the two variables included in the VAR system has to be stationary in levels to conduct the pair wise Granger causality test. If the targeted series is non-stationary in levels, we can try first or second differences that ignore the long-term integration relationships. We may give fake causality relationships that affect negatively the results and decrease its trust (Égert & Kočenda, 2007).

Data analysis

Descriptive statistics of the research data are presented in Tables 1 and 2. Table 1 describes basic descriptive statistics for the market return of the three countries, i.e. USA, Malaysia and Jordan over the period from 1994 to 2010. The results showed that ASE has the highest mean and also the highest standard deviation which means that ASE is the highest risk and return. KLCI has the lowest return with high risk while Dow Jones has a moderate return with the lowest risk.

Table 1

Descriptive Statistics of Stock Market Return

Descriptive	DOW Return	KLCI Return	ASE Return
Mean	8.359699	5.072401	11.30076
Median	11.02000	2.773343	-1.563224
Maximum	33.45156	44.86053	92.94093
Minimum	-33.84000	-52.25532	-32.63627
Std. Dev.	17.62222	27.10582	33.33105
Skewness	-0.740081	-0.520964	1.041335
Kurtosis	3.028720	2.543789	3.289780
Jarque-Bera	1.552457	0.916400	3.131885
Probability	0.460138	0.632421	0.208891
Sum	142.1149	86.23082	192.1129
Sum Sq. Dev.	4968.685	11755.61	17775.35
Observations	17	17	17

Table 2 shows basic descriptive statistic for the GDP of the three countries: USA, Malaysia and Jordan over the period from 1994 to 2010. These results show that Jordan and Malaysia have the same growth rate, which are more than the United States' growth rate.

Table 2

Descriptive Statistics of Gross Domestic Production

	GDPUSA	GDP Malaysia	GDP Jordan
Mean	2.600000	5.300000	5.320588
Median	3.000000	6.100000	5.270000
Maximum	4.900000	10.00000	8.560000
Minimum	-3.500000	-7.400000	2.090000
Std. Dev.	2.079964	4.424223	2.152387
Skewness	-1.598237	-1.601471	0.111748
Kurtosis	5.454169	5.202592	1.750358
Jarque-Bera	11.50361	10.70309	1.141519
Probability	0.003177	0.004741	0.565096
Sum	44.20000	90.10000	90.45000
Sum Sq. Dev.	69.22000	313.1800	74.12429
Observations	17	17	17

Augmented Dickey- Fuller (ADF) is calculated for various all time-series individually in order to provide evidence that the variables are stationary. The results in Table 3 showed that all studied series are stationary at constant level except the Malaysian GDP rate, which has been stationary after the first difference conversion.

Table 3

Unit Root test Augmented Dickey-Fuller test (ADF)

Unit Root test	t-Statistic	Prob.	Differences
Augmented Dickey-Fuller test statistic ASE	-1.2242	0.6364	I(0)
Augmented Dickey-Fuller test statistic DOW	-2.5301	0.1272	I(0)
Augmented Dickey-Fuller tet statistic KLCI	-1.5758	0.4712	I(0)
Augmented Dickey-Fuller test statistic GDP Jordan	-1.6054	0.4570	I(0)
Augmented Dickey-Fuller test statistic GDP USA	-2.3804	0.1619	I(0)
Augmented Dickey-Fuller test statistic GDP Malaysia	-2.9707	0.137	I(1)

After making sure that all time series is stationary, this study has raised an important issue, which is the investigation of whether the growth in GDP rate and the growth in market return are caused by each other by running Pair wise Granger Causality Tests. Table 4 summarized the causality tests which accept the null hypothesis on the relations between GDP in Jordan and ASE returns, ASE returns and GDP in Jordan. That means both ASE return and GDP in Jordan cannot predict each other. The results also accepted the null hypothesis and proved that GDP in Malaysia cannot predict KLCI returns. On the other hand, the results proved that KLCI return can predict GDP in Malaysia. The results of the USA proved the context of Malaysia that the Dow Jones reactions can predict GDP in the US, while GDP in USA cannot predict the Dow Jones returns.

Table 4

Pairwise Granger Causality Tests

Null Hypothesis	F-Statistic	Probability
GDP in the USA does not Granger Cause DOW	0.64060	0.5473
DOW does not Granger Cause GDP in the USA	13.3965	0.0015
GDP in Malaysia does not Granger Cause KLCI	0.94409	0.4211
KLCI does not Granger Cause GDP in Malaysia	12.0639	0.0022
GDP in Jordan does not Granger Cause ASE	2.35816	0.1449
ASE does not Granger Cause GDP in Jordan	0.37742	0.6950

Conclusion

The main goal of this study is to test the causality bi-directional relationship between economic growth and the market growth, which analyzes the medium-term mutual influence between the economic growth and movement of stock indices in the financial market. The study has conducted the test on three different markets in terms of their economic nature; America, Malaysia and Jordan during the period from 1994 to 2010. This study showed inconstant results in the three given countries, which proved that there existed a contrast in the relationship between economic growth and market growth.

Results in the U.S.A though showed that market growth caused economic growth, but no reverse causation was observed. The results were totally in agreement with the results of (Mahdavi & Sohrabian, 1991), which have been tested for the same relationship in the US with an overall difference in the time frame. Such results have led us to believe that the stock market in the US plays as an instrument that helps stabilization in the economy. The results are also in line with the results of (Caporale et al., 2004; Diebold & Yilmaz, 2008) who have proven the same unidirectional relationship.

The unidirectional relationship existed also in Malaysia, but in this case the economic growth caused market. The results were in agreement with the results of (Chen et al., 1986; Nasseh & Strauss, 2000). They showed a positive effect of macroeconomic variables in the direction of the stock market in Malaysia. Although the results in Jordan were different from those of U.S.A and Malaysia, the researchers could not find evidence of causality relationship between market growth and economic growth in the two directions. The results are totally opposite to what has been proposed by (Luintel & Khan, 1999) when they have investigated the given relationship in 10 developing countries in the long-term.

The absence of a causal relationship leads the researchers to believe that the investors in ASE do not take the fundamental or macroeconomic variables in mind when they enter the market. Also, the stock market did not cause any development in Jordanian economy in the medium-term. The inconsistent results in the three mentioned countries have proved that the characteristics of the economy affect the causality relationship between market growth and economic growth in that the stock market in poor developing countries does not cause economic growth. Also, the investors in some of the given countries might not use the macroeconomic variables to predict the stock market returns.

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