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The Impact of Stock Market Development on Gross Domestic Product

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ABSTRACT

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Keywords Gross domestic products, Stock market. The aim of the study is to show the relationship between the stock market developments with gross domestic products (GDP). Framework is used to show the impact of stock market on GDP over the period of 2000 to 2011 quarterly. The methods applied in the research were correlation, regression and Augmented Dicky Fuller unit root test. The arguments are made on whether it is the stock market that leads to the economic growth or the other way around. Stock market plays a very significant role as a financial intermediary. Some researchers are in favor of the argument that stock market doesn't lead to the economic growth and conclude that emerging stock markets have little positive impact on economic growth. Some analysts argue that, because most of the corporations don't raise capital by issuance of equity only, so the role of stock market is weak in causing economic growth, (Mayer, 1988). In contrast, Levine (1991) show that stock markets provide liquidity and can cause economic growth substantially. And now the result of research explained that there is no significant impact or stock market development on gross domestic product. The Augmented Dicky Fuller unit root test explained that 1) D (logn_index_points) represents the 1st difference and the p value is less than 0.01 so we reject the null hypothesis and conclude that the data of index points is stationary at 1st difference. 2) D (LOGN_REAL_GDP) represents the 2nd difference of GDP of Pakistan and the p value is less than 0.01, so we reject the null hypothesis and conclude that the data of GDP is stationary at 2nd difference. The regression result shown that D2LOGN_REAL_GDP represents the 2nd difference of quarterly GDP of Pakistan and DLOGN_INDEX_POINTS represents the 1st difference of KSE-100 index which has been used as a proxy for stock market development for the purpose of this study. The P value against the t-statistic is insignificant, so we have to accept the null hypothesis.

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Introduction

A lot of debate exists on the relationship of stock markets and economic growth. The arguments are made on whether it is the stock market that leads to the economic growth or the other way around. Stock market plays a very significant role as a financial intermediary. Some researchers are in favor of the argument that stock market doesn't lead to the economic growth and conclude that emerging stock markets have little positive impact on economic growth. Some analysts argue that, because most of the corporations don't raise capital by issuance of equity only, so the role of stock market is weak in causing economic growth, (Mayer, 1988). In contrast, Levine (1991) show that stock markets provide liquidity and can cause economic growth substantially.

The relation between country's stock market and economic activity is important area to study in order to get some meaningful findings. So far there is not much research available in order to build some concrete arguments as to the role of stock market in causing economic growth and the limited research that is available have mixed results. Some are in favor of stock market causing economic growth and some are against this argument. Therefore, this study will contribute to the already available limited literature in the context of Pakistan.

The relationship of stock market and economic growth doesn't have significance for the investor only but to the Government and the private sector as well.

Problem Statement

A lot of economists are of the view that stock market as a secondary market provides liquidity to the primary market and a good use of people's savings and without stock market it is impossible to have companies which contribute to the GDP significantly. Primary market provides investment capital which helps in generating output.

Some economists claim that stock market has no role in GDP rather it is just an increased economic activity which is independent of the stock market being expanded. A country still can have increase in its GDP without having to expand its stock markets.

This study contributes to the already available literature and focuses on the impact of stock market development on the GDP of Pakistan.

Research Question

Does stock market development impact GDP of Pakistan?

Research Objective

The objective of this study is to examine the impact of stock market development on the GDP of Pakistan.

Significance of the study

Stock market as a financial intermediary has a very crucial role. There are numerous studies available on impact of macroeconomic and micro-economic variables on economic growth of Pakistan. All these studies lack stock market development as one of the variable and covering the period of 2001 onwards.



Limitation of study

This study is limited to only one stock market of Pakistan which is Karachi stock exchange and the year 2011 to 2014 have not been included because of the non-availability of quarterly GDP of Pakistan for the said period.

Literature Review

Baotai Wang and D. Ajit (2013) studied stock market and economic growth in China from 1996 to 2011 and concluded that there exist negative relationship between real stock market development and real GDP growth in the long run.

Vazakidis and Adamopoulos (2009) studied stock market and economic growth of France over the period of 43 years from 1965 to 2007 and their results of Granger causality indicated that economic growth caused stock market development and inferred that economic growth has positive impact on stock market development.

Adamopoulos (2010) studied stock market and economic growth in Germany from 1965 to 2007 and indicated that there is unidirectional causality between stock market development and economic growth with direction from stock market development to economic growth.

Caporale et al., (2004) used a sample of 7 countries to study the causal linkage between stock market development and economic growth from 1977 to 1998 and concluded that stock market development causes economic growth in 5 of the countries studied. Their result is consistent with the findings of Levine and Zervos (1995) and the argument by Demirguc-Kunt (1994) that stock markets can give a big boost to economic development.

Arestis et al., (2001) investigated the role of stock markets in economic growth using a sample of 5 developed countries with quarterly data from 1968 to 1998 and reported that stock market may contribute to economic growth but there influence is small fraction of that of the banking system.

Levine and Zervos (1998) investigated the empirical relationship between various measures of banking development, stock market development and long-run economic growth with a sample of 47 countries from 1976 to 1993 and their results suggested that a strong positive relation existed between financial development and economic growth, and financial factors are the most significant part of the growth process. They found no support for the argument that stock market liquidity or international capital market integration reduce private saving rates or hinder long-run growth.

Rousseau and Wachtel (2000) examined the annual data of 47 countries from 1980-1995 and indicated stock exchanges to be key institutions in promoting economic activity and suggest that the occasional setbacks that appear to be the consequences of rapid market development are perhaps best viewed in light of the more optimistic longer-term role for stock markets.

Beck and Levine (2004) used turnover ratio, value traded and market capitalization for stock market development, bank credit for bank development and output growth in their study for 40 countries from 1976 to 1998 and found that their data was consistent with the theories emphasizing a significant positive role for financial development for economic growth.

Boubakari (2010) studied the role of stock market development and economic growth for 5 Euronext countries from 1995 to 2008 and found positive links between the two for countries where stock market was liquid and highly active. However the countries where stock market was small and less liquid didn't show any role of stock market in causing economic growth. So a highly active and liquid stock market was important for its role in causing economic growth. Harris (1997) found that for less developed countries the impact of stock market on economic growth was very weak and reported that for developed countries stock markets had some explanatory power, using a sample of 49 countries from 1980 to 1991.

Yang and Yi (2007) investigated if financial development cause economic growth in Korea using annual data from 1971 to 2002 and concluded that in their test for superexogeneity, they found that financial development control causes economic growth but the reverse is not true.

Kabir Hassan et al., (2010) studied financial development and economic growth in 168 countries from 1980 to 2007 and found that a low initial GDP per capita level is associated with higher growth rate, after controlling for financial and real sector variables. Furthermore they found a strong long-run linkage between financial development and economic growth. Countries with low economic growth and financial development have more room for improvement than countries with high economic growth and high financial development.

Caldero and Liu (2013) studied the direction of causality between financial development and economic growth in 109 countries including developing as well as industrial economies from 1960 to 1994 and concluded that financial development enhances economic growth in all countries. The results of their study are related to Kabir Hassan et al., (2010) indicating that financial intermediaries have larger relative effects in lessdeveloped economies than in more developed economies.

Marco Pagano (1993) studied financial markets and economic growth and concluded that financial development can cause economic growth by funneling savings to firms, improving the allocation of capital, affecting the savings rate and risk sharing.

Atje and jovanovic (1993) construct a cross-country panel of 40 countries from 1980 to 1988 and report that the value of stock market trading relative to GDP has a significant influence on economic growth after controlling for lagged investment.

Singh (1997) focuses his research on developing countries and seeks to understand the role of stock markets towards long run economic growth in the 1980s and 1990s. He concludes that in developing countries, long run economic growth does not show dependency towards the stock market.

Tuncer and Alovsat (2000) investigate the causal relationship between stock markets and economic growth in 20 countries from 1981 to 1994. The panel data analysis indicates that there is a bi-directional causation between stock market development and economic growth. Although a concrete conclusion cannot be reached on the country base analysis, they do claim that there is a rather strong linkage among the variables under study in developing countries.

Research Methodology

Numerous researchers have investigated the relationship and causal linkage between stock market development, financial development and economic growth (Wang and Ajit, 2013; Caporale, 2004; Arestis, 2001 among others).

Wang and Ajit (2013) used real capitalization of stock market and real GDP as one of the measure for economic growth.Caporale (2004) used stock market capitalization measured by value traded to GDP, market capitalization to GDP as a proxy for stock market development and GDP levels as a proxy for economic growth in their study. Arestis (2001) measured the variable of financial development by ratio of stock market capitalization to GDP, stock market volatility and economic growth by real GDP. Beck and Levine (2004) used stock market development proxied

by turnover ratio, value traded, market capitalization and economic growth by output growth.

This study focuses on the impact of stock market development on GDP of Pakistan. This study uses KSE-100 index as a proxy for stock market development, which is a freefloat market capitalization weighted index representing 80% of the total free-float capitalization of the companies listed on the Karachi stock exchange.Vazakidis and Adamopoulos (2009) used general stock market index as a proxy for stock market development in their study. Real GDP is used as the dependent variable, which has been used as a proxy for economic growth in other studies like Arestis (2001) and Wang & Ajit (2013).

Theoretical Framework

A theoretical framework or conceptual framework is an illustrated representation of an idea or body of knowledge based on individual understanding of the relationship between the variables.



Figure 1. shows the dependent and independent variable and the hypothesized Relationship between them.

Variables

There are two types of variable whose relationship has been illustrated through figure 1.

Dependent variable

This study uses real gross domestic product as the dependent variable.

Gross domestic product

The value of total goods and services produced in the country, during a specific period is called gross domestic product for that period. As Pakistan Bureau of Statistics doesn't publish quarterly GDP of Pakistan, this study has used the estimates of quarterly GDP of Pakistan (Real) from Quarter 1 of 1999-2000 to Quarter 4 of 2009-2010 provided by Hanif, Iqbal & Malik (2013) and published by State Bank of Pakistan.



Figure 2. Indicating the information of Quarterly GDP of Pakistan (Real) over 11 years period

Independent variable

This study uses stock market development as independent variable.

Stock market Development

Stock market development is proxied by KSE-100 index which is a free float market capitalization weighted index. The KSE-100 Index was introduced in November 1991 with base value of 1,000 points. The Index comprises of 100 companies selected on the basis of sector representation and highest Free-Float Capitalization, which captures around 80% of the total Free-Float Capitalization of the companies listed on the Exchange. Out of the 33 Sectors, 32 companies are selected i.e. one company from each sector (excluding Open-End Mutual Fund Sector) on the basis of the largest Free-Float Capitalization and the remaining 66 companies are selected on the basis of largest Free-Float Capitalization in descending order. This is a total return index i.e. dividend, bonus and rights are adjusted.



Figure 3. Shows KSE-100 index points from 1st Quarter of 1999-2000 to Quarter 4 of 2010-2011. The 1st Quarter is from July to September 1999

Hypothesis

There is only one hypothesis because this study is confined to only one independent variable that is stock market development.

H₀: There is no significant impact of stock market development on GDP of Pakistan.

 H_1 : There is significant impact of stock market development on GDP of Pakistan.

Model

Y

$$Y = \beta 0 + \beta 1 \text{ Smd} + e$$

Where

= Real GDP of Pakistan

Smd = Stock market development proxied by KSE-100 index

e = error term

 $\beta 0 = intercept$

 $\beta 1 = \text{slope of smd}$

Source of Data

This study uses secondary data. Quarterly KSE-100 index has been obtained from Karachi stock exchange and for Quarterly Real GDP of Pakistan this study used the estimates provided by Hanif, Iqbal & Malik (2013) and published by State Bank of Pakistan.

Sample size

Most recent 11 years is the sample selection criteria for this study. The sample size of the data used in this study is from 3^{rd} quarter of 1999 to 2^{nd} quarter of 2010. Data from the 3^{rd} quarter has been used because the period for which GDP is calculated in Pakistan starts in July which is the 3^{rd} quarter of the year. Pakistan's quarterly GDP is available till 2010, that's why years 2011 to 2014 have not been covered in this study.

Econometric technique

To examine the relationship of dependent and independent variables (stock market development and real GDP) this study used descriptive statistics for describing the data, correlation for the relation between the two variables, unit root test for checking the stationary of dataand regression analysis. The statistical software "EViews" has been used.

Correlation

Correlation is statistical method to find out the linear relationship between two variables. It is a standardized measure and the minimum value is -1 that signifies perfect negative relation between the two variable and the maximum value is +1 indicating perfect positive relation between the two variables.

Dependent Variable	Formula
Y	Real GDP of Pakistan
Independent Variable	
SMD	KSE-100 index

Descriptive analysis			
	LOGN_REAL_GDP	LOGN_INDEX_POINTS	
Mean	13.93012	8.465161	
Median	13.92977	8.706019	
Maximum	14.24344	9.624163	
Minimum	13.55274	7.033013	
Std. Dev.	0.190904	0.853519	
Skewness	-0.037681	-0.382587	
Kurtosis	1.949763	1.627941	
Jarque-Bera	2.032575	4.524736	
Probability	0.361936	0.104104	
Sum	612.9251	372.4671	
Sum Sq. Dev.	1.567109	31.32525	
Observations	44	44	

	LOGN_REAL_GDP	LOGN_INDEX_POINTS
LOGN_REAL_GDP	1.000000	0.836855
LOGN_INDEX_POINTS	0.836855	1.000000

Unit root test for Logn_index_points

Null Hypothesis: D(LOGN_INDEX_POINTS) has a unit root			
Exogenous: Constant			
Lag Length: 0 (Automatic - based on SIC, maxlag=9)			
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.701477	0.0000
Test critical values:	1% level	-3.596616	
	5% level	-2.933158	
	10% level	-2.604867	
*MacKinnon (1996) one-sided p-values.			

Unit root test for Logn_real_gdp

Null Hypothesis: D(LOGN_REAL_GDP,2) has a unit root			
Exogenous: Constant			
Lag Length: 3 (Automatic - based on SIC, maxlag=9)			
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-11.30848	0.0000
Test critical values:	1% level	-3.615588	
	5% level	-2.941145	
	10% level	-2.609066	
*MacKinnon (1996) one-sided p-values.			

Dependent Variable: D2LOGN_REAL_GDP				
Method: Least Squares				
Date: 03/21/15 Time: 12:02				
Sample (adjusted): 2000Q1 2010Q2				
Included observations: 42 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
С	0.017133	0.047139	0.363456	0.7182
DLOGN_INDEX_POINTS	-0.448905	0.268541	-1.671641	0.1024
R-squared	0.065298	Mean dependent var		-0.003512
Adjusted R-squared	0.041930	S.D. dependent var		0.301206
S.E. of regression	0.294824	Akaike info criterion		0.441568
Sum squared resid	3.476837	Schwarz criterion		0.524315
Log likelihood	-7.272937	Hannan-Quinn criter.		0.471898
F-statistic	2.794383	Durbin-Watson stat		3.685248
Prob(F-statistic)	0.102402			

Augmented Dicky Fuller unit root test

Unit root test is used to check if the data is stationary or not. If the data is not stationary then it means that the mean and the variance change overtime and the results of regression will have no meaning.

Regression Analysis

Regression is the simple statistical technique used to examine the relation between variables which are dependent and independent in nature. The dependent variable is represented by Y and independent variable by β .

Finding and Analysis

In this chapter the results of data analysis are given.

Descriptive analysis

The standard deviation for the GDP and Index points is low and ignorable. Similarly the Skewness tells us about the normality of data. The data of GDP and index points is negatively skewed but the extent to which it is negatively skewed is very low and ignorable. Kurtosis represents the peak of data and is less than 3, so our data is flatter.

Correlation matrix

The above table shows the correlation between GDP and index points and there exists a strong positive correlation between the two variables.

Unit root test

The results of the unit root test for the index points and GDP are given below.

Unit root test for Logn_index_points

In the above table D(logn_index_points) represents the 1st difference and the p value is less than 0.01 so we reject the null hypothesis and conclude that the data of index points is stationary at 1st difference.

Unit root test for Logn_real_gdp

In the above table D(LOGN_REAL_GDP,2) represents the 2^{nd} difference of GDP of Pakistan and the p value is less than 0.01, so we reject the null hypothesis and conclude that the data of GDP is stationary at 2^{nd} difference.

Regression Analysis

In the unit root test we concluded that the KSE-100 index and the GDP of Pakistan are stationary at 1^{st} difference and the 2^{nd} difference respectively. Now data has been modified accordingly and regression analysis is used to test the hypothesis presented in chapter of research methodology.

In the above table D2LOGN_REAL_GDP represents the 2nd difference of quarterly GDP of Pakistan and DLOGN_INDEX_POINTS represents the 1st difference of KSE-100 index which has been used as a proxy for stock market development for the purpose of this study. The P value against the t-statistic is insignificant, so we have to accept the null hypothesis.

Conclusion and Recommendation

Conclusion

On the basis of results of this study in the previous chapter this study concludes that there is no significant impact of stock market development on GDP of Pakistan. The reason of this insignificant impact of stock market development on GDP of Pakistan requires further research.

Recommendation

This study is in support of the view that increase in GDP can only be obtained through increased economic activity, so the focus should be increased economic activity rather than increase in the stock market capitalization.

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