

Stock Market Development, Can it Help Reduce Inflation in SAARC Countries?

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This study is designed to evaluate the impact of stock market development on general price level in five SAARC countries. The estimated results of Panel OLS, Fixed Effect model and Random Effect model has revealed that OLS model is not applicable thus, we have to use panel cointegration to find out the unbiased and normally distributed coefficient estimates to find out how the stock market development influences inflation. The results of long run estimates Fully Modified OLS suggests that in the long run, market capitalization is decreasing inflation, total value of stock traded is increasing inflation and turnover ratio is decreasing inflation in the long run. Thus, the results of our two proxies suggest that stock market development can help put chains on inflation in SAARC countries by introducing more firms to increase size and volume of share transaction, as they will load to rise in production.

JEL Codes: E44, O43, E31

1. Introduction

Stock market acts as a catalyst in the economy and thus can be considered as an important part. The function of a catalyst is quite simple, not to influence or change but to regulate and accelerate other economic activities. Some theories suggest that the Stock market collects the money and distributes it in the more productive and efficient sector of the economy (Caporale et al., 2004; Billmeier and Massa, 2009; Cooray, 2010). In addition, the stock market can encourage economic growth in a country by attracting people with cash to invest and providing them a platform and creating cash movement from investors to businesses that require capital and also a share in their risk (Levine, 1991; Levine and Zervos, 1996; Rousseau and Wachtel, 2000; Arestis et al., 2001; Enisan and Olufisayo, 2009; Hou and Cheng, 2010).

These functions of the stock market could be demonstrated as follows; a stock market provides a platform to the investors, mobility of the money and helps by providing them with the financial instruments. Stock market also helps co-ownerships by providing different and more efficient ways of sharing risk in the stock market. As the Stock market acts as a platform the invested money is then distributed to the more efficient and productive businesses of the economy, which are the listed companies in the stock market. Stock market also creates investment opportunities for the domestic and foreign investors. Stock market also promotes saving in the country and more saving means more cash for the people to invest which may result in more cash flow in the economy.

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Hence, it is easy to expect that stock market contribution is just as important as other economic sector because stock market has a direct link with the efficient and productive businesses of the economy. Therefore, stock market is the leading economic activity in a country (Pierce, 1884). While the stock market development could be the cause of economic development in the country, it is still questionable to say that these factors may follow either a positive or negative direction but it is also possible that causality will happen in both directions (Bosworth, 1975; Nieuwerburgh et al., 2006). The South Asian Association for Regional Cooperation (SAARC) countries like Pakistan, Bangladesh, India, Sri Lanka and Nepal are all in developing state and their economic sectors are growing. The stock markets of these countries are also evolving and we need to make sure whether it is feasible to let them grow freely or do we need to have a regulation to control the stock markets because there is viable chance that they can impact on inflation.

High inflation may be good for the country if the economic growth is increasing income/sale and at the same time, production is increasing. If inflation continues to grow higher, the economy becomes unstable and is unable to meet the demands of the buyers. Therefore, if productive sector is performing less, the movement of cash from buyer to seller slows down and consumer due to lack of cash cannot buy more products from the local seller. The lack of saving and less investment in the stock market makes it difficult for the companies in the stock market to get resources from the investors causing them to make less capital investments resulting in shrinking economy. The purpose of this study is to test whether the stock market development has positive or negative impact on inflation and whether it can or cannot help control inflation in the long run. For this purpose, we will use data from SAARC (South Asian Association for Regional Cooperation) countries and use panel data to conclude the result of this theory by comparing our finding.

This part of the study called as the organization of this study gives the reader a brief introduction of what the research is going to discuss further in the research. Literature Review section tells about the current and theoretical knowledge about the selection of dependent and explanatory variables. Methodology section contains all the research questions, methods used and the type of data used for the research. Estimation section contain tables, which are used for the acceptance or rejection of research question hypothesis. Conclusion section consists of conclusion of the study, policy implication and limitation.

2. Literature Review

The pattern of the causal effect on the relationship between inflation and stock market development is mixed because some studies have found a positive relationship between stock market and inflation while others have found negative relationship whereas, in some cases, no relationship has been found between stock market and inflation.

These studies report a positive link between inflation and stock market in the long run as well as short run (Dhakal et al., 1993; Abdullah and Hayworth, 1993; Groenewold et al., 1997; Ratanapauorn and Sharma, 2007). A positive relationship between stock market returns on inflation rate was investigated (Choudhry, 1998) in four high inflation countries (Argentina, Chile, Mexico & Venezuela) and it was concluded that the stock returns act as a hedge against inflation. A test was conducted among the causal relationship between both expected and unexpected inflation and real stock returns, and discovered that a positive relationship does exist (Caporale and Jung, 1997). Hess and Lee (1999) claim that the sign of the correlation between stock prices on inflation depends upon the nature of the shock creating inflation.

According to them, the negative relationship is due to the supply (real output) shocks while the positive relationship is due to the demand (monetary) shocks. In addition, Graham (1996) discovered a positive relationship between stock returns on inflation. However, (Devereux and Smith, 1994) found a negative effect of stock market development on growth, which means that the stock market development through decreasing the GDP can lead to increase in inflation. Satti et al. (2013) analyze the impact of financial development and globalization on inflation for the case of Bangladesh and suggested that there is positive relationship between financial development and inflation.

However, other studies suggest that the relationship between stock price index and inflation is negatively related in the short and long-term because the stock market influences the economic activities but more specifically, it influences the industrial activities (Fama and Schwert, 1977; Fama, 1981; Chen et al., 1986; DeTina, 1991; Humpe and Macmillan, 2009). Bakshi and Chen (1996) discuss that a negative correlation between stock prices on inflation has become one of the most commonly recognized practical facts. In addition, Chatrath et al. (1997) discovered that the negative stocks return on inflation were explained in the Indian economy. The results indicate a partial support to Fama's hypothesis. Zhao, (1999) found a significant negative relationship between stock prices on inflation in Chinese economy. This result is consistent with Fama's hypothesis (Fama, 1981). Spyrou, (2001) examined the relationship between stock market returns on inflation rate in Greek by using monthly data from January 1990 to June 2000. The result for the period 1995-2000 showed a negative but insignificant relationship, while for the period 1990-1995 there was a significantly negative relationship. Omran and Pointon, (2001) used co-integration analysis and error correction model to analyze the impact of the Egyptian stock market on inflation. The results show that the stock market has a definite negative impact on inflation in Egyptian stock market. Saleem et al. (2013) has found negative relationship between stock market and inflation in the case of Pakistan because it is an under developed country and when inflation occurs the economy is effected which effects the stock market as well. Zaman et al. (2010) found the relationship between financial development, economic growth and inflation for the case of Pakistan. They claim that the money supply affects economic growth and inflation whereas Granger causality test suggested that financial development reduces inflation.

Studies like (Morley, 2002; Pradhan, 2011 and Cakan, 2013) found existence of bidirectional causality between stock market and inflation because stock market is used as a hedge against inflation. Hardouvelis, (1988) found no significant relationship between the two variables. The study will also use one control variable, money supply as M2. The reason for choosing one control variable is that according to quantity theory of money, if amount of money in an economy were increasing, it would result in increase in prices and cause inflation. As the study only discusses about the impact of stock market development on inflation, hence money supply as control variable is used in this study (Friedman, 1987).

The study will use panel data because it contains five countries from SAARC, which are highly connected or influential on each other. For the purpose of estimation, the study will use three proxies of stock market. The precious studies have not conducted a study on SAARC countries. Another reason why this study is different from all the other studies is that, the countries selected in this research are all developing countries with different religions, growing stock markets, high inflation, unemployment, population size, culture, geographical difference and mobilization of money is different.

3. Methodology

The individual time series data taken for the SAARC countries that include Bangladesh with 24 observations from 1989 to 2012, India with 24 observations from 1989 to 2012, Nepal with 18 observations from 1995 to 2012, Pakistan with 24 observations from 1989 to 2012 and Sri Lanka with 24 observations from 1989 to 2012; with the total of 114 observations. Data is collected from the World Development Indicator database of the World Bank. For our study, we are using three proxies for stock market development; Market capitalization, Market turnover and total value of traded stocks. In addition, one control variable, money supply would be used. Inflation is taken as consumer price index being a dependent variable. The study uses panel data, which consists of both time series and cross sectional data.

3.1 Research Objective

The objective of the study is to check whether or not stock market development can reduce inflation in the long run for the SAARC countries. For this purpose, we are using the following SAARC countries: Pakistan, India, Bangladesh, Nepal and Sri Lanka.

3.2 Main Research Question

Does a selected stock market development indicator help in slowing down inflation or contribute in rise of inflation in long run for the SAARC countries?

3.3 Data Description

This section of the study will discuss whether the data set is normally distributed and whether there is correlation between the variables.

Table 1: Descriptive Statistics

	CPI	MP	ST	TR	M2
Skewness	-0.371	-0.480	-0.366	-0.138	0.050
Kurtosis	2.599	3.118	2.831	2.272	2.820
Jarque-Bera	3.379	4.443	2.677	2.877	0.200
Probability	0.185	0.108	0.262	0.237	0.905
Observations	114	114	114	114	114

The Table 1 Descriptive Statistics is used to check the normality of data series. The normality of data series is tested by using the values of Skewness, Kurtosis and the probability value of Jarque-Bera which shows that the data set is normally distributed. The correlation between the variables is tested in the Table 2-Correlation Matrix and in this table there is weak positive correlation between consumer price index and market capitalization, stock traded, and turnover ratio; while there is high positive correlation of consumer price index with money supply.

Table 2: Correlation Matrix

	CPI	MP	ST	TR	M2
CPI	1				
MP	0.297	1			
ST	0.301	0.732	1		
TR	0.210	0.366	0.896	1	
M2	0.580	0.639	0.514	0.286	1

3.4 Model

For the estimation purpose, the study will use the Equation 1 mentioned below and run OLS on it.

Equation 1:

$$\text{LNCPI}_{it} = \beta_0 + \beta_1 \text{LNMP}_{it} + \beta_2 \text{LNST}_{it} + \beta_3 \text{LNTR}_{it} + \beta_4 \text{LNM2}_{it} + e_t$$

Whereas,

't' is number of years from 1989 to 2012

'i' is number of countries, which are Pakistan, Bangladesh, India, Nepal and Sri Lanka.

The natural logarithm of each variables is taken in order to make the residual normally distributed and to make the value of each variable in percentage form.

LNCPI = Log of Consumer Price Index

LNTR = Log of Turnover Ratio

LNMP = Log of Market Capitalization

LNM2 = Log of Money Supply

LNST = Log of Total Value of Stock Traded

The Table 3 shows the estimated values of VIF matrix which are used to check multicollinearity in the model. As the estimate values of VIF Matrix are less than 10 and suggest that there does not exists any problem of multicollinearity in the model (Gujrati, 2004). In this table, the Thiel R2 test value of 0.12 which is near to 0 shows that there is no multicollinearity effect in between these variables (Theil, 1971).

Table 3: VIF Matrix

	LNCPI	LNMP	LNST	LNTR
LNMP	1.097	-		
LNST	1.099	2.153	-	
LNTR	1.046	1.154	5.063	-
Theil R2 Multicollinearity Effect				
Theil R2 value			0.12	

4. Estimation

This section of the study is used to find out the estimated values of the long and short run tables using the Equation 1 model to accept or reject the proposed hypothesis.

Table 4: Unit Root Test

At Level								
	Levine, Lin & Chu		IM, Pesaran & Shin		ADF Fisher		PP Fisher	
	Cal.Value	P.Value	Cal.Value	P.Value	Cal.Value	P.Value	Cal.Value	P.Value
LNCPI	1.01	0.84	4.30	1.00	1.76	0.99	1.90	0.99
LNMP	-1.24	0.10	-0.99	0.16	13.45	0.20	13.49	0.20
LNST	-1.70	0.04	-1.18	0.12	14.17	0.17	18.58	0.05
LNTR	-2.42	0.01	-1.94	0.03	18.70	0.04	27.39	0.00
LM2	-0.08	0.47	1.09	0.86	5.77	0.83	5.78	0.83

The estimated values of Table 4 are used to check whether there is a unit root problem in the model. The estimated values at level suggest that there is a mixed level of cointegration in the model and at first difference in the probability value of all the variables is less than 0.05 accepting the alternative hypothesis that there does not exist problem of unit root in the model. So we now have to make sure, if there is cointegration.

Table 5: Kao Residual Co-integration Test

Augmented Dickey Fuller	t-Statistic	Prob.
		-3.509

Table 6: Long Run Estimates FMOLS

Dependent variable: LNCPI		
Variable	Coefficient	Prob.
LNMP	-0.402	0.000
LNST	0.530	0.000
LNTR	-0.525	0.000
LM2	0.642	0.000
R-Squared	0.437	
Jarque Bera (Prob)	4.53 (0.10)	

The Table 5 is used to test whether there exist co-integration in the model. The probability values of Kao residual co-integration test suggests that there exist long run relationship between the variables in the model (Kao 1999). The estimated values of FMOLS model shown in Table 6 suggest that there is a significant long run relationship between the variables which is also suitable for inference as the residuals are normal as suggested by the Jarque Bera Test. Here, if market capitalization increases by 1%, it will decrease inflation by -0.402%. If total value of stock traded increases by 1%, then it will increase inflation by 0.530%; inflation will decrease by -0.525%, if turnover ratio increases by 1% and If money supply increased by 1%, it will increase inflation by 0.642% which is fulfilling with the quantity theory of money.

Table 7: Short Run Estimates OLS

Dependent variable: ΔLNCPI					
Sample Size: 104					
Variable	Coefficient			Prob.	
ΔLNMP	-0.013			0.262	
ΔLNST	0.003			0.832	
ΔLNTR	-0.001			0.946	
ΔLNM2	-0.192			0.004	
ECM(-1) – Bangladesh	0.06			0.025	
ECM(-1) – India	-0.02			0.020	
ECM(-1) – Pakistan	0.001			0.055	
ECM(-1) – Nepal	0.04			0.827	
ECM(-1) – Sri Lanka	-0.02			0.076	
C	0.082			0.000	
R-Squared	0.32	Prob (F-Statistics)	0.000	F-Statistics	3.50

The estimated results of Table 7 shows short run estimates using OLS. In this short run results, the convergence coefficient has been treated with the cross sectional dummies to generate country specific convergence coefficients. There, we can see that out of 5 SAARC countries, the model is showing convergence in only India and Sri Lanka. The reason behind this slow convergence could be that the stock market in the SAARC countries is not mature rather it is in its developing state, hence it is taking more time to influence inflation through the stock market development.

5. Conclusion

The stock market development is treated as an important part of an economy because it can improve the productive sector of the economy. Stock market development can help control inflation because when an investor has enough money to spend, they come to the stock market. The stock market gives a platform to the company and investor, so that the savings from investor are properly utilized. When investment from household is provided to the company through stock market, the company has two choices to make, either spend the money on expansion of business to meet the demand hence inflation is decreased or product differentiation by changing the appearances of the product to make it more attractive and increase the price hence inflation is increased. For SAARC countries, this research is important because these countries are in developing state and inflation can make it difficult for any country in the development process. If stock market development can help reduce inflation in SAARC countries, then it can create a big difference because first, it will help industries to grow and generate employment. Secondly, low inflation will help the economy to grow and lastly, with increasing growth and development in industries, it will give companies a competitive advantage in the global market against developed countries.

The findings from our estimation results suggest some possible policies for our model. The results of Kao Residual, Long Run Estimates FMOLS and Short Run Estimates OLS have suggested that there is long run, short run in the model but also there is convergence, which suggests that this model can be used to achieve the target of reducing the inflation rate through stock market development. The results show that if the size of the stock market is increased through increase in the market capitalization then it will help to reduce inflation at the rate of 0.15%, this is because the size of the stock market increases when firms perform

better or increase its capacity which consequently lead to reduction in the prices. Here, policy makers can promote the big firms to participate in expanding the businesses which will ultimately lead to higher production, higher employment and through the consequence of outcome presented in this study lower inflation. According to the results, if only number of stocks increase, which happens when new firms enter into the listing of stock market, it will lead to increase the inflation. Probably, most of the companies when they first enter into the market carry the objective to finance their existing deficit (paying off the debts) using the investment received from the stock sales. Which is because the countries in the sample are developing with immature stock markets and companies use this source as the last resort to sale portion of the business to get the resources. Here, policy makers can regulate the stock market and discourage the firms to float their shares for the sake of deficit, instead the floating of shares should be for expansion of assets. Turnover ratio as an indicator of stock market development represents the rate at which shares are changing hands, which means the times the shares are sold and resold. Shares usually change hands frequently if its price is changing; if the price increases, people become interested in investing in the stock market hence more firms are benefited by receiving idle savings of the household. Policy makers can improve the sale and purchase procedure of the shares so that wider net of investors can be tapped in.

The limitations of this study highlighted was that when the data was collected from all seven countries; the data for Afghanistan, Bhutan and Maldives was not available, so the study had to be conducted for only five countries. Secondly, if a disaggregated analysis of the stock market is done to see which firm is selling shares for expansion and which is selling for differentiation can yield more in-depth outcomes.

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