Capital Market of Bangladesh: Volatility in the Dhaka Stock Exchange (DSE) and Role of Regulators

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Received: December 17, 2010 Accepted: February 27, 2011 doi:10.5539/ijbm.v6n7p86

Abstract

Over the last few years, the capital market of Bangladesh has witnessed a haughty growth which is not in line of development in the real sector of the economy. Although, the Securities and Exchange Commission (SEC) of Bangladesh has tried to correct the irregular behavior observed in the market, very often it is argued that lack of proper and firm decisions from the regulator's side has contributed to make the market more unstable rather than to reduce it. The paper attempts to identify the casual relationship between the observed volatility in the country's major bourses namely the Dhaka Stock Exchange (DSE) and the regulatory decisions taken by the SEC empirically. Using Vector Auto-regressive (VAR), statistically highly significant relationship was found between decisions taken by the regulatory authority and market volatility, although the direction of causality is in reverse order than theoretically and empirically expected. Again, though the number of decisions taken by the SEC immediately, with longer time the response was in opposite direction than expected.

Keywords: Volatility, Stock market, Dhaka Stock Exchange, Bangladesh capital market, Regulators

1. Introduction

Although volatility is regarded as a major challenge for the sustainable development of the stock markets, for a number of countries capital market development has been accompanied by increased volatility (Wei, 2005). The lack of efficient regulation over the securities market and business is viewed as a major reason which is hindering the healthy development of the securities market. The volatility of the securities market is also associated with governance problems of the market. The market regulators all over the world consider market bubbles exhibiting "irrational exuberance" to have a potential for economic disruptions and distortions. Besides, the perception of speculative behavior works against creating trust and a sense of fairness in financial markets. When combined with allegations of market manipulations, insider trading, and outright scams, the speculative nature of the market can be a serious impediment to capital formation, and efficient functioning of the financial markets (Krishnamurti et. al., 2003).

Regulators seek to find the right blend of regulation, disclosure and enforcement, and consultation between the public, industry and the relevant stakeholders. Different jurisdictions have adopted different systems of securities regulation. The divergence of securities regulation and practices illustrates that different social, political, economic, and historical environments foster different systems of securities' regulation and practice, suitable to the specific circumstances (Fagan, 2003).

Over the last few years' country's major stock market namely the Dhaka Stock Exchange (DSE) has witnessed very high growth. The DSE all share price index (DSI) has reached at 3747.53 at the end of year 2009, which is about 199 per cent higher compared to that of year 2005. This rally of increasing trend is also visible for other major indicators such as DSE general index (DGEN), the blue chip companies (DSE20) and so with their positive influence on increasing market capitalization. The recent vibrant nature of the capital market might be due to the increased interest in the market by a large number of individual investors which has been influenced by the government's decision to reduce the bank interest rates for its different types of savings instrument. But,

the perturbing aspect of this sharp rise is the accompying increase of "Price Earnings (P/E) Ratio", which is making investment in the capital market risky overtime.

After the crash of 1996, the capital market of Bangladesh has attracted a lot more attention, importance and awareness and a number of investment-friendly regulatory reforms relating to public issue, rights issue, acquisition, mergers have been implemented by the Securities and Exchange Commission (SEC). Strict rules and guidelines, trading circuit breakers, international standard surveillance and disclosure requirements for both listed scripts and IPOs, have been introduced to protect investor rights and ensure fair play (Rashid, 2008). Even after all these initiatives from the regulators side, the market is yet to be labeled as a secure place for the general investors due to the presence of irregularities. The SEC has intended to correct the irregular market behavior in the short run by using its limited instruments such as changing Margin Loan Ratio, discouraging trade of overvalued shares (by taking them in 'over the counter' or 'spot market') changing settlement period and separation of counter for trading based on their counter, which the SEC has used more or less in a timely manner so far. But, in some cases lack of proper and firm decisions from the regulator's side e.g. face value harmonization have made the market more unstable. However, to manage the market successfully in the long run, it is felt that these are not enough rather the regulator should go for more prudent and timely decisions. In the current state of market growth, role of regulators has been questioned in two accounts. Firstly, whether regulators act promptly to address the short-term volatility in the DSE and secondly, whether frequent changes in regulators' decisions contribute negatively in the way of sustainable development of the market.

The present study has attempted to find out answers of these questions empirically. Firstly the study has tried to analyze the overtime nature and trend of volatility of the major indicators of DSE. Secondly, the study has attempted to find out the factors i.e. economic or regulatory measures which have contributed to the observed volatility at DSE.

2. Empirical Findings

In empirical literature there are a number of studies to measure the development of stock exchanges, but every few to examine the determinants of the observed volatility in the market quantitatively. Ferris and Chance (1988) in their study recognized the role of change of margin ratio by the regulators to influence the speculative behavior in the stock market. Yenshan (1996), for Taiwan also found that changes in margin requirements, which is one of the major intervention done by the stock market regulators, has contributed to make share price volatile. Razin, et al (1999) concluded that weak form of regulation promotes greater moral hazard and adverse selection problem in the stock market which in effect hinders possibilities of international investments. Raju and Ghosh (2004) in attempting to calculate the volatility of stock prices for a number of countries came into conclusion that both in Indian and Chinese stock market volatility is higher compared to other emerging economies. Döpke et. al. (2005) using monthly data of Germany concluded that volatility in the stock market can be explained by the performance of major macroeconomic indicators which have influence on business cycles. Uppal and Mangla (2006) empirically concluded that although the Indian regulatory agencies managed to control excessive market volatility to a large extent, the Karachi Stock Exchange demonstrated little success. They argued that market behavior due to regulatory responses depends both on the structure of industry and effectiveness of the regulations. In an attempt to find the determinants of stock volatility, Verma and Verma (2007) concluded that investors' irrational sentiments contribute more strongly to increase the stock volatility than to reduce it.

In attempting to investigate the role of regulators in shaping the stock market of Bangladesh, Ahmed (2005) concluded that the regulations are not competent enough to promote the market. She also suggested major structural changes in the regulatory mechanism of this market for its future development. In an attempt to find the prime factors that are responsible for the relative price fluctuation in the Dhaka Stock Exchange (DSE), Rahman and Rahman (2007) concluded that the relative variability in a stock price and the general level of that price are related with variables like earning variability, price-earnings ratio and turnover of the stocks.

In an attempt to identify the possible impacts of monetary policies especially the linkage between interest rate change and capital market development for Bangladesh, Barua and Rahman (2007) found less clear-cut relation only for short term. According to them, the prices of stocks for a country like Bangladesh depend mainly on new reform measures and government incentives. Ahmed and Samad (2008) using different descriptive statistics for DSE tried to find whether the general non-systematic behavior of stock price holds at sectoral level and concluded that rumor and non-declaration of any dividends also affect share price. Finally, they suggested that the regulatory decisions should be taken well ahead to reduce the unintended shocks in the market. While trying to find out the factors which determine the price of stocks in DSE, Uddin (2009) concluded that the prices of stocks rarely reflects the development in macro economy rather corresponds closely with the micro information such as net asset value, dividend percentage, earnings per share. Alam and Uddin (2009) using monthly data for fifteen developed and developing countries found strong relationship between share price and interest rate-one very important macroeconomic variable or change in share price and change in interest rate. Studies on stock market of Bangladesh largely associates volatility with various factors rather than the role of regulators' or

weaknesses in regulations. In this state, the present study attempts to examine the market volatility in two accounts namely its association with the regulatory measures as well as with relevant macroeconomic factors.

3. Data and Methodology

Using regression analysis, we have attempted to identify the factors which might have contributed in the observed volatility of DSE General Index (VDGEN) in the country's major brushes and especially the inter-relationship between volatility and regulators' role. Firstly, following the methodology used by Rahman and Hossain (2007) we have estimated volatility in the Dhaka Stock Exchange. Then, we have applied vector autoregressive (VAR) for its suitability to determine the relationship when there is simultaneity among the variables (Sims, 1980). Again, as the theories give little guidelines on whether the decisions taken by the regulatory authorizes impact on volatility or the decisions taken by them are to targeted to reduce volatility, it is better to use VAR approach as it collect many causal variables (Allen and Fildes, 2001). In estimating the VAR to find out the casual relations among different variables we have considered information from both real economy and monetary sector. The variables used are the Quantum Index of Production for general manufacturing (QIP), flow of remittances (R), Consumer Price Index (CPI), Broad Money Supply (M2), and Commercial Deposit Rates (less than for 3 months) (DR) for the period of July, 2005 to December, 2009. In addition to the above mentioned variables, we have constructed a special continuous variable "Decision (D)" by counting the number of decisions (e.g. Securities Laws, Order, Notification, Directive, Guideline etc) taken by the Securities and Exchange Commission of Bangladesh (SEC) targeting to the market behavior per month to see the role of regulators in relation to the perceived volatility in the market. The rationale of taking the variable is to test the general hypothesis floated in the market that the regulators also play a role in promoting volatility in the market or regulators of our market are not efficient enough to act promptly to suppress the market volatility.

Data for this study has been collected from various national sources such as Bangladesh Bureau of Statistics (BBS), Bangladesh Bank (BB), Dhaka Stock Exchange (DSE) and Securities and Exchange Commission (SEC), Bangladesh. To calculate volatility index and we have considered the major indicator reported by the DSE in its *Recent Market Information* page due to their utmost importance.

3.1 Volatility Trend at DSE

From our analysis on volatile nature of DSE, we have found that over time the market is becoming more volatile which has been captured by the major indices of the market (Table-1). However, if we look at the volatility for other indicators then we can see that overtime volatility has decreased.

We have gone for an in-depth analysis to see whether there is any periodical nature of this increasing volatile behavior, where we have considered two major indices namely DSI and DGEN for our purpose. The rationale for selecting these two indicators is to observe whether the perceived volatile behavior in the market is due to the presence of Z category shares or not. Based on our analysis, we can see that, during the initial period of global financial crisis, the market became more volatile, which decreased subsequently (Figure-1). But, the highest level of ups-and downs has been observed with the inception of Grameen Phone (GP) in the market. However, this extreme high value of volatility can be also attributed to the faulty system of calculating indices of DSE, which has got attention after the huge jump in share indices in one day in the very first day of trading of GP. Along with GP factor, a number of unstable decisions e.g. margin loan facility, face value harmonization, debate on capital gain tax and so on have contributed to make the market more volatile in the recent months, which is not desirable from the general investors' perspective.

3.2 Determinates of Volatility

From the estimated regression, we can see that the casual relationship between decisions taken by the regulatory authority and market volatility is statistically highly significant (Table-2). But, the direction of causality is in reverse than theoretically and practically expected, as decisions taken by the SEC increases volatility whereas although volatility increases the number of decisions taken by the SEC immediately, with longer time the response was in opposite direction than expected. However, our findings are in line with the earlier empirical findings on this area (Yenshan, 1996; Razin, et al, 1999).

Apart from the effects of regulator's decision on volatility observed in the country's main stock exchange some macro variables such as remittance inflow and commercial deposit rate for less than three months also have unidirectional and negative influence on volatility which was also mentioned by Döpke et. al. (2005), in their earlier study.

However, even our attempt to identify the causality among different macroeconomic as well as policy decisions taken by the regulators, the study suffers from a number of limitations as we could not able to analyze the recent volatility in the market due to lack of availability of monthly data for all the relevant variables. We could not capture the role of government's different policies in the field of monetary, fiscal or foreign trade which also play a very important role in the movement of stock prices. Again, the time of global financial crisis, which is believed to have its positive impact on the volatility in the stock market, is subsumed in the period of our analyses and hence cannot be explained based on only regulator's role.

4. Conclusion

From our analysis we have found that major indicators of the country's major stock exchange is becoming more volatile over time and the regulators are not efficient enough to guard this volatility. But, for a developing country like Bangladesh, the importance of sound development of the market cannot be undermined. Although the SEC has been trying to maintain a continuous flow in the market, very often its role meets the broad economic objectives. In order to make the market less volatile, SEC itself should be strengthen both in terms of number of manpower and quality of the professionals involved with special focus on independent research, monitoring mechanism and prompt decision making. However, the following steps might be considered from the regulators position for the sound development of the market so that the interests of all parties in the market are addressed properly.

- The decisions taken by the regulatory authority should be made as much as predictable with providing adequate explanation for the investors. Again, before taking any major regulatory decisions a broad-based consultation among widely representative advisory committees, deliberations with the stock exchanges and intermediary associations, chambers of commerce and investor associations and the public which helped drive market consensus for the reforms could be considered by the SEC.
- Making relevant information available, relating to specific securities SEC should monitor strongly the quality of audited reports, which requires transparency and accountability of audit firms in topmost.
- SEC along with the government should take steps to increase the number of mutual fund to stabilize the market in the long run, which can be done by enforcing a level playing regulatory measure for public and private mutual funds.
- To bring more companies which have good track record in terms of financial performance tax gap between listed and non-listed companies could be made in such a way that they are encouraged to enlist in the market. For this purpose, for different sectors different margins can be considered as well.
- Government can also take pro-active role in building a stable market through tapping the growing interest of general people in the market by increasing supply of shares.
- Off-loading State Owned Enterprises (SoEs) in the capital market will entail government to sell corporations in a profitable manner and will also diversify the market.
- Public utilities and infrastructure related projects can also be asked to raise a part of debt through issue of marketable bonds.
- Considering the growing interest of mass people, facilities of share business e.g. brokerage house should be spread all over the major points of the country. In this connection, expansion of information technology, especially availability of internet facilities at root level can be very helpful.
- Spread of capital market educational programme up to root level needs to be strengthened, as to protect the interest of new investors minimum level of knowledge on capital market is very important.
- Finally setting up a separate judiciary mechanism for settlement of disputes in the share markets (within a specified time limit) and restore the investors' confidence can be considered seriously.

To guide and restore the confidence of individual investor in capital market, the regulatory authority should take necessary actions to encourage corporate governance rating among listed companies, which will enable investors to differentiate the good governance companies from the rest and can then attach higher value to those firms as well. And, without improving the governance of the market and eliminating scope of manipulation, it will be difficult to attract good scripts at the desired level. In this endeavor, regulators must adapt continuously to the changes in the economy and the pressures of globalization.

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Table 1. Overtime comparison of volatility of major indicators at Dhaka Stock Exchange (DSE)

Indicator	July05 to May10	July06 to May10	July07 to May10	July08 to May10	July09 to May10
Total Trade	15.12	16.05	14.80	14.83	13.08
Total Volume	23.10	23.86	22.15	19.21	16.09
Value in Taka	20.95	22.15	18.61	12.38	15.03
Market Cap	1.02	1.20	1.19	1.23	1.38
DSI	1.14	1.35	1.38	1.48	1.62
DGEN	1.16	1.37	1.43	1.54	1.70

Source: Authors' calculation.

Table 2. Causality among different factors with market volatility

Variables	2006m2 - 2009m12*						
	D	Ln(VDGEN)	Ln(QIP)	Ln(R)	Ln(CPI)	Ln(M2)	Ln(DR)
D (L1)	-.3613 (0.011)	.0924 (0.000)	0.0032 (0.288)	.0028 (0.630)	.0036 (0.068)	.0005 (0.495)	-.0046 (0.018)
D (L2)	-.5496 (0.004)	.0471 (0.079)	0.0065 (0.112)	-.0159 (0.046)	.0032 (0.234)	-.0002 (0.824)	-.0039 (0.140)
Ln(VDGEN) (L1)	.0059 (0.995)	-.2902 (0.031)	-.0097 (0.637)	.0656 (0.101)	.0082 (0.546)	.0014 (0.803)	-.0056 (0.674)
Ln(VDGEN) (L2)	-3.5832 (0.000)	-.1674 (0.241)	-.00827 (0.706)	.00151 (0.972)	-.0057 (0.695)	-.0038 (0.538)	-.0027 (0.852)
Ln(QIP) (L1)	-9.3844 (0.179)	-.8269 (0.395)	.2848 (0.056)	.3561 (0.219)	-.1274 (0.198)	.0158 (0.706)	.0532 (0.582)
Ln(QIP) (L2)	-.5964 (0.919)	.0559 (0.946)	-.3722 (0.003)	-.5351 (0.029)	.0323 (0.699)	-.0674 (0.056)	-.0649 (0.427)
Ln(R) (L1)	5.4502 (0.126)	-.8510 (0.086)	-.2017 (0.008)	.0924 (0.531)	.0418 (0.407)	.0355 (0.096)	.0389 (0.582)
Ln(R) (L2)	-4.1355 (0.255)	-1.5492 (0.002)	.2272 (0.003)	.2682 (0.075)	-.0200 (0.698)	.0041 (0.852)	.0228 (0.650)
Ln(CPI) (L1)	23.0520 (0.068)	-1.5320 (0.383)	-.3894 (0.149)	.9676 (0.064)	1.3382 (0.000)	-.0017 (0.982)	.4894 (0.005)
Ln(CPI) (L2)	-31.1390 (0.024)	2.9856 (0.121)	.4320 (0.144)	-1.0012 (0.081)	-.3387 (0.084)	-.0138 (0.867)	-.5241 (0.006)
Ln(M2) (L1)	56.7820 (0.019)	-.5984 (0.859)	-.2928 (0.572)	-.2277 (0.821)	-.1115 (0.746)	.5925 (0.000)	-.3092 (0.356)
Ln(M2) (L2)	-45.0403 (0.051)	3.8667 (0.229)	.5543 (0.262)	1.3130 (0.171)	.0054 (0.987)	.3669 (0.008)	.3527 (0.270)
Ln(DR) (L1)	-10.1089 (0.344)	.3851 (0.796)	-.0047 (0.983)	.3124 (0.481)	-.0312 (0.837)	-.0105 (0.870)	.8210 (0.000)
Ln(DR) (L2)	-45.0403 (0.150)	-2.5108 (0.075)	.2661 (0.220)	.1132 (0.788)	.08977 (0.533)	.0477 (0.432)	-.1281 (0.361)
Constant	-90.0487 (0.032)	-8.8717 (0.128)	2.3665 (0.008)	-6.2367 (0.000)	1.5154 (0.011)	.3613 (0.149)	-.4168 (0.472)

Source: Authors' estimation

Note: 1. *Figures in the parentheses are *P-value.*

2. L1 and L2 mean lag of one period and two periods respectively.

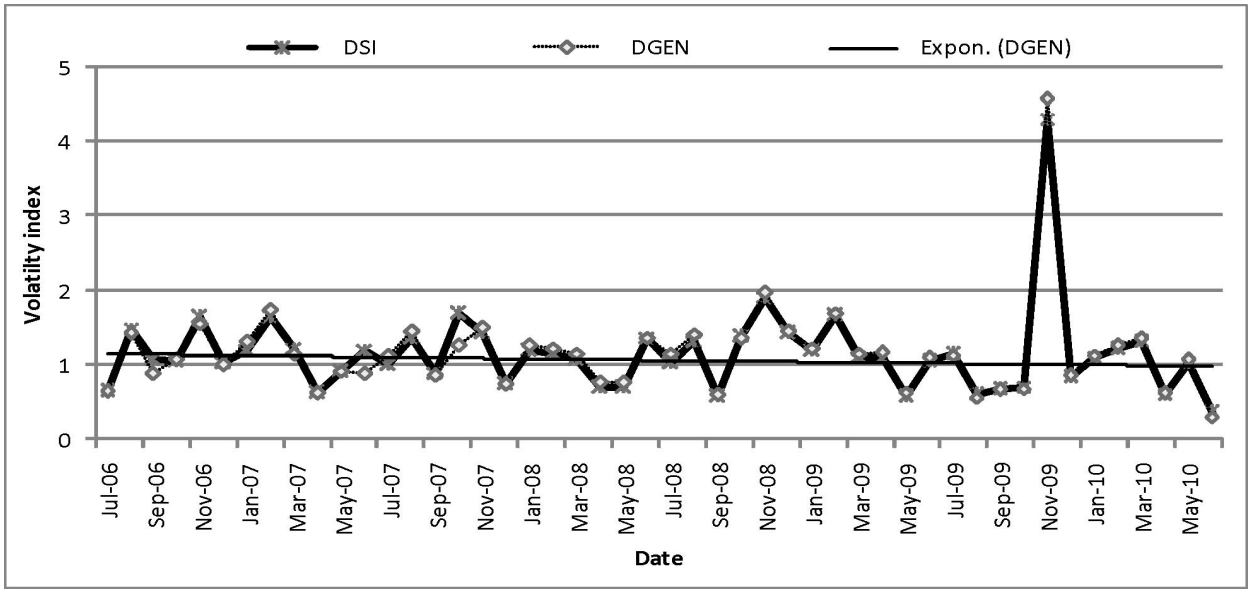

Figure 1. Pattern of Volatility of Major Indices at Dhaka Stock Exchange (DSE)

Source: Authors' calculation based on data from DSE

Annex

Vector Autoregressive (VAR): In general, an *n*-equation VAR is an *n*-variable linear system in which each variable is in turn explained by its own lagged values and past values of the remaining *n-1* variables. Furthermore, in an *n*-variable unrestricted VAR, each and every concerned variable in the system is assumed to be endogenous and no a-priori restrictions are imposed (Enders, 1995).

Although the individual coefficient from any VAR estimation does not offer very meaningful relationship, the technique is still widely used in analysis of time series behavior of economic variables. The reasons for use of this technique in time series analysis lie mainly in the simplistic nature of the modeling technique as it is based on very little economic theory and it free from structural restrictions of any particular model builder. This approach does not require any specification regarding which variables are the endogenous or exogenous for any specific model and it also does not require any specific direction of causality among the concerned variables as a priori, which have exceptional advantages to use in any macroeconomic analysis especially for fiscal variables.

Table 1. Trend of major indicators at Dhaka Stock Exchange (DSE)

Indicators (Year End)	**2005**	**2006**	**2007**	**2008**	**2009**	**% change (2009 over 2005)**
Total Trade	8838	18213	36222	92350	144907	1539.6
Total Volume	1406713	13257430	5775761	29109210	30586541	2074.3
Total Value (Million USD)	0.05	0.16	0.28	0.92	1.97	3950.0
Market Capitalization (Million USD)	59.58	70.10	155.75	221.79	402.07	574.8
DSE All Share Price Index (DSI)	1251.32	1321.4	2535.96	2309.35	3747.53	199.5
DSE General Index (DGEN)	1642.47	1609.51	3017.21	2795.34	4535.53	176.1
P/E Ratio	13.85	14.51	23.58	18.42	25.65	
No. of New IPOs	17	7	14	12	18	

Source: Compiled from various issues of Monthly Reviews of DSE.

Table 2. Diagnostic statistics of vector auto regression

Sample	2006m2 - 2009m12	2006m2 - 2009m10
No. of observations	45	43
Log likelihood	397.8306	388.1621
AIC	-13.0147	-13.1703
HQIC	-11.4432	-11.5844
SBIC	-8.7992	-8.8697

Source: Authors' estimation

Table 3. Diagnostic statistics of vector auto regression (VAR)

	2006m2 - 2009m12					2006m2 - 2009m10				
Equation	Parms	RMSE	R-sq	chi2	P>chi2	Parms	RMSE	R-sq	chi2	P>chi2
D	15	2.3087	0.5039	45.7063	0.0000	15	2.2669	0.5491	52.3708	0.0000
Ln(VDGEN)	15	.3211	0.5417	53.1970	0.0000	15	.3146	0.4139	30.3714	0.0068
Ln(QIP)	15	.0494	0.7889	168.1516	0.0000	15	.0452	0.8197	195.4709	0.0000
Ln(R)	15	.0958	0.9153	486.52	0.0000	15	.0982	0.9076	422.2599	0.0000
Ln(CPI)	15	.0328	0.9794	2138.165	0.0000	15	.0338	0.9742	1625.157	0.0000
Ln(M2)	15	.0139	0.9961	11629.19	0.0000	15	.0141	0.9956	9672.831	0.0000
Ln(DR)	15	.0319	0.7766	156.4572	0.0000	15	.0328	0.7772	150.0227	0.0000

Source: Authors' estimation

Table 4. Causality among different factors with market volatility (excluding GP factor)

Variables	2006m2 - 2009m10*						
	D	Ln(VDGEN)	Ln(QIP)	Ln(R)	Ln(CPI)	Ln(M2)	Ln(DR)
D (L1)	.1615 (0.566)	.0229 (0.557)	.0164 (0.004)	-.0035 (0.775)	.0030 (0.475)	.0004 (0.822)	-.0074 (0.071)
D (L2)	-.4149 (0.153)	.0159 (0.692)	-.0024 (0.676)	-.0096 (0.446)	.0018 (0.680)	-.0016 (0.365)	-.0045 (0.286)
Ln(VDGEN) (L1)	-.4114 (0.690)	-.2551 (0.075)	-.0391 (0.058)	.0829 (0.064)	.0068 (0.658)	-.0004 (0.945)	-.0032 (0.831)
Ln(VDGEN) (L2)	-4.0394 (0.000)	-.0842 (0.571)	.0011 (0.955)	-.0066 (0.888)	-.0029 (0.855)	-.0014 (0.839)	-.0005 (0.972)
Ln(QIP) (L1)	-13.4764 (0.070)	-.1161 (0.910)	.3365 (0.023)	.3053 (0.342)	-.1059 (0.339)	.0339 (0.464)	.0707 (0.500)
Ln(QIP) (L2)	.4762 (0.934)	-.0672 (0.933)	-.3270 (0.004)	-.5598 (0.025)	.0328 (0.702)	-.0658 (0.067)	-.0707 (0.397)
Ln(R) (L1)	6.9669 (0.053)	-1.1079 (0.027)	-.2148 (0.003)	.1073 (0.492)	.0345 (0.521)	.0294 (0.191)	.0317 (0.544)
Ln(R) (L2)	-5.1495 (0.148)	-1.4020 (0.005)	.2132 (0.003)	.2729 (0.077)	-.0175 (0.742)	.0057 (0.799)	.0279 (0.588)
Ln(CPI) (L1)	27.1509 (0.035)	-2.3118 (0.196)	-.5043 (0.050)	1.0593 (0.058)	1.3101 (0.000)	-.0267 (0.740)	.4708 (0.012)
Ln(CPI) (L2)	-35.4908 (0.013)	3.8388 (0.052)	.5773 (0.042)	-1.1137 (0.070)	-.3064 (0.148)	.0152 (0.864)	-.5047 (0.014)
Ln(M2) (L1)	52.6562 (0.032)	-.4139 (0.903)	-.7347 (0.133)	.0409 (0.969)	-.1418 (0.698)	.5575 (0.000)	-.2833 (0.425)
Ln(M2) (L2)	-38.7917 (0.095)	3.3144 (0.305)	.9703 (0.037)	1.0701 (0.288)	.0245 (0.944)	.3926 (0.007)	.3166 (0.347)
Ln(DR) (L1)	-15.4076 (0.150)	1.1793 (0.427)	-.0549 (0.797)	.3225 (0.486)	-.0157 (0.922)	.0004 (0.995)	.8476 (0.000)
Ln(DR) (L2)	10.5343 (0.297)	-1.8641 (0.184)	.2620 (0.194)	0.0987 (0.822)	.1053 (0.485)	.0597 (0.344)	-.1082 (0.460)
Constant	-84.5474 (0.038)	-9.6655 (0.087)	2.4472 (0.003)	-6.2657 (0.000)	1.5022 (0.013)	.3531 (0.164)	-.4448 (0.151)

Source: Authors' estimation

Note: 1. *Figures in the parentheses are *P-value.*

2. L1 and L2 mean lag of one period and two periods respectively.