Impact of Macroeconomic Variables on Stock Market Liquidity

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ABSTRACT

In order to escalate economic growth and making healthy financial sector of any economy, stock markets play the significant role with other channels. Researchers found in their studies that for influencing stock markets, there are many economic as well as institutional determinants that enhance the performance of stock markets. In this study an attempt is made to measure the question of how much stock liquidity is influenced by macroeconomic variables in case of Pakistan. For this purpose time series data is used for analysis by considering liquidity in Pakistan stock exchange using time span from 2016 to 2020. In making an econometric model to analyze the impact on stock market liquidity, the following indicators such as industrial production growth rate, inflation, exchange rate and military expenditures are involved to make the model more realistic and statistically significant. In order to measure relationship, reliability and causality, regression technique is utilized by using quantitative data. After analyzing the results, in the end of the study the policies and implication are given in the shape of recommendation for corrective measures.

Keywords

Stock Market Liquidity, Macroeconomic

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Introduction

Bing an essential part of financial sector of an economy, financial sector is an important channel for enhancing the stages of growth among other channels in any country. Macroeconomic theories suggested that overall increase in growth and promoting economic activities are made if there exist an efficient and effective financial sector in an economy. Financial sector link the businesses sector with household sector and enable the channel of demand for funds and supply of funds that leads to increase net investment and other factors that make the economic structure strong and effective. A healthy financial sector is a guard against negative shocks that constantly trying to reduce the performance of economy by disturbing the economic structure. (Rehman & Salahuddin) (Caporale , Howells , Soliman , 2004). Liquidity factor is important for trading systems as well as for stock exchanges and for attracting order flow and listings. If the investors or traders have the ability to buy or sell shares without influencing the price that condition of market is considered as liquid. (Wuyts, 2007).

The literature found that performance of any stock market is depends on its liquidity condition as opposed to the situation when the market is in a condition of less liquid that impact negatively on market efficiency. In order to measure liquidity, four dimensions are considered such as (1) Trading Time – the capability of completing buying and selling process at existing price immediately (2) Tightness may be explain as an assets' buying or selling at the same price and time. (3) Depth may be explained as the capability of selling/purchasing of some proportion of an acquired asset but the quoted price not affected by this. (4) fourth dimension is Resiliency: may be defined as the effect on quoted price is least when the buying and selling is taking place.

Pakistan as a developing country and having struggling economic structure, the stock market in Pakistan is also affected by many macroeconomic and political variables. The Central Bank of Pakistan is successful to some extent by implementing policies that provide healthy environment to investors in stock exchange. During the pandemic of COVID-19, State Bank of

Pakistan' polices are highly appreciable in order to restore the investors' confidence.

This study is also an endeavor among many to identify the relationship of stock exchange liquidity with macroeconomics variables with respect to Pakistan. This research article is structured in 5 segments. The introduction is included in Section 1 of the paper. Section 2 included review of national and international literature. Section 3 of the paper included the complete methodology used in the paper. Section 4 comprises of result estimation for the study. In section 5 of the paper conclusion and policy recommendations are included.

Literature Review

This section of the paper is comprised of the findings of the previous literature review in this respect. Previous studies have been made to explore various aspects of stock markets such as the importance, properties, development and liquidity of stock markets but the effect of macroeconomic factors is still to resolve.

Ahmed, Khan & Tariq (2012) considered Pakistan and Bangladesh economy in order to explore the relationship of stock market development on economic growth. The study provided the evidence of strong positive associationship of stock market development and economic growth. The study also found that market capitalization is also an important factor for economic growth in case of Pakistan.

Alajekwa & Bernard (2012) considered Nigerian economy and found that market' size in not a favorable factor for the development of economy but impact on economic growth due to stock market development is significantly positive in case of Nigerian economy.

Zafar (2013) considered Pakistan's economy and found that the implication of Greenfield investment and VAT is significantly positive on financial market (stock market) efficiency. The study also highlighted the surprising result that the impact of banking sector development is insignificant.

Yartey (2008) included macroeconomic variables and institutional variables for the study and highlighted that among macroeconomic variables the institutional variables are also responsible for the better performance of stock market in the economy by using panel data of 42 emerging economies.

El-Nadir & Alraimony (2013) considered the data related to the economy of Jordan and found that macroeconomic variables such as money supply, total value traded, gross capital formation, CPI and credit to private sector have significant positive impact on stock market development. The study also explored that Nominal Gross Domestic Product and Net Remittances have negative significant impact on stock market development.

Catherine (2011) selected ASEAN nations for the study in order to measure the relationship of concerned variables of interest and found that the domestic and world stock market variables are also responsible for the development of domestic stock market. The findings of the study are highlighted that increase of GDP, real rate of interest and rate of exchange of currency are favorable for the development of domestic's financial market. Similarly, country's FM is also affected positively by World stock market.

Bellalah, Levyne & Masood (2013) conducted the research by considering variables such as SEP, OP, TOT, IR, IPI and MS and found that there exist a short run and long run relationship among variables in case of USA, Japan and China.

Muhammad & Rasheed (2013) considered economy of Pakistan, India, Bangladesh and Srilanka for the analyzing purpose. They found that there is no long run relationship exists among variables of interest for India and Pakistan and the study also concluded that the longrun relationship is found in case of Bangladesh and Sri Lanka.

Methodology

The article in question analyses the influence of macro-economic factors on the stock liquidity in Pakistan. Inflation, Industrial Production Growth Rate, Exchange Rate and Money supply are the independent variables while Stock liquidity is the dependent variable. Military government is the dummy variable. The paper analyzed the stock movement of Karachi Stock Exchange and to measure the liquidity, stock turnover is taken. The data is extracted from various national and international issues published periodically by Pakistan' Central Bank and World Bank ranging from 2016 to 2020.

3.1. Econometric equation to be estimated

This multiple linear regression model is used to estimate the parameters.

$STLIQ = \alpha_0 + \alpha_1 M2 + \alpha_2 INR + \alpha_3 IPGR + \alpha_4 EXCH + \alpha_5 D_5 + \varphi$

$\alpha 1 > 0 \quad \alpha 2 < 0 \quad \alpha 3 > 0 \quad \alpha 4 > 0$

Where:

α_0 is a constant and β_1, β_2, β_3, β_4, β_5, β_6 are parameters.

M2 = Money supply

INF = Inflation

IPGR = Industrial Production Growth Rate

EXCH = Exchange rate

$D_5 = 1$, if non-democratic govt.

$D_5 = 0$, if democratic govt.

For the purpose of estimation OLS technique is applied using time series data. This technique is used to identify the directions and magnitude of independent variables on dependent variables.in addition to this further technique such as coefficient of correlation is also applied with the use of descriptive statistics.

Findings Using Econometric Techniques

Descriptive Statistics

Table 1

	DUMMY	EXCH	INF	IPGR	M2	STLIQ
Mean	0.636364	69.11608	186.87	5.628182	4555106	54691.89
Median	1	61.4258	158.6	4.13	4406846	53076.88
Maximum	1	92.5805	322.53	16.26	8254210	96957.75
Minimum	0	57.5745	110.71	-0.1	1927995	28018.15
Std. Dev.	0.504525	13.12969	73.6223	5.198963	2050737	24660.95
Skewness	-0.566947	0.718494	0.696305	0.779657	0.405346	0.482933
Kurtosis	1.321429	1.802201	2.116883	2.594874	2.037046	1.891604
Jarque-Bera	1.880687	1.604011	1.246326	1.189645	0.72623	0.990659
Probability	0.390494	0.448429	0.536246	0.55166	0.695506	0.60937
Sum	7	760.2769	2055.57	61.91	50106170	601610.8
Sum Sq. Dev.	2.545455	1723.889	54202.43	270.2922	4.21E+13	6.08E+09
Observations	11	11	11	11	11	11

Correlation Matrix (CM)

Table 2

	DUMMY	EXCH	INF	IPGR	M2	STLIQ
DUMMY	1	-0.964906	-0.898335	0.494575	-0.858349	0.654603
EXCH	-0.964906	1	0.961859	-0.479074	0.924273	-0.658035
INF	-0.898335	0.961859	1	-0.351238	0.986226	-0.552707
IPGR	0.494575	-0.479074	-0.351238	1	-0.320424	0.571733
M2	-0.858349	0.924273	0.986226	-0.320424	1	-0.484317
STLIQ	**0.654603**	**-0.65804**	**-0.55271**	**0.571733**	**-0.48432**	**1**

Table shown above exhibit the CM. It's highlighted that Industrial Production Growth Rate is positively and strongly correlated with stock liquidity while exchange rate and inflation are strongly and negatively correlated with stock liquidity. Money supply is weakly but negatively correlated and the dummy variable is having positive and strong correlation with Stock liquidity. This shows that industrial production growth rate, exchange rate and inflation has strong relation with stock liquidity. Correlation with dummy variable reflect that military government influence the stock liquidity positively.

Ordinary Least Square Estimation

Table 3

Dependent Variable: LOG(STLIQ)				
Method: Least Squares				
Date: 02/01/2021 Time: 14:46				
Sample (adjusted): 2016 2020				
Included observations: 9 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	83.38525	11.10903	7.506077	0.0049
LOG(EXCH)	-17.06234	2.074631	-8.224275	0.0038
LOG(IPGR)	0.317636	0.050027	6.349343	0.0079
LOG(M2)	-1.371279	0.571424	-2.39976	0.0959
DUMMY	-3.079867	0.406616	-7.574382	0.0048
LOG(INF)	4.168532	1.171008	3.55978	0.0378
R-squared	0.99001	Mean dependent var		10.86207
Adjusted R-squared	0.973361	S.D. dependent var		0.49691
S.E. of regression	0.081103	Akaike info criterion		-1.951468
Sum squared resid	0.019733	Schwarz criterion		-1.819985
Log likelihood	14.78161	F-statistic		59.46201
Durbin-Watson stat	2.96911	Prob(F-statistic)		0.00336

The estimated values of the table no. 3 exhibit that IPGR, INF and EXCH are linked to the dependent variable i-e Stock Liquidity. It shows that IPGR and INF are favorable for the betterment of stock liquidity. Similarly, exchange rate and dummy variable are not favorable for the betterment of stock liquidity. Money supply was identified as insignificant i – e does not affect the liquidity of stock. Furthermore, it is also found the value of adjusted R^2 is acceptable.

The resultant equation can be expressed as:

STLIQ = 83.39 -17.06EXCH + 0.317IPGR - 3.08D + 4.17INF + 0.08

Conclusion and Policy Recommendations

This section of the paper discussed the conclusion and policy recommendations for the said study. This empirical effort investigated the link between macro-economic factors and Stock liquidity in Pakistan Stock Exchange. The paper considered variables such as IPGR, INF, EXCH and MS from 2016 – 2020.The study also included military and non – military government as dummy variable. The study identified that Industrial Production Growth Rate, Inflation, Exchange Rate and military government significantly affect stock liquidity. Therefore in order to attract foreign capital and for a strong capital formation in Pakistan, policies are required focusing these macroeconomic variables. The growth of industrial production significantly influences stock liquidity. Hence, appropriate policies should be focused in order to increase productivity. This can ultimately create a welcoming environment for the investors. At the same time policies focusing the inflation rate and stabilizing exchange rate are also required.

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APPENDIX

Table 1.1

YEARS	EXCH	M2	DUMMY	INF	IPGR	STLIQ
2002	61.4258	1927995	1	110.71	4.13	29140.66
2003	58.4995	2266163	1	115.61	2.7	53076.88
2004	57.5745	2731049	1	124.55	4.24	96957.75
2005	59.3576	3201870	1	133.33	16.26	88301.19
2006	59.8566	3679033	1	147.28	12.12	79454.3
2007	60.6342	4406846	1	158.6	4.11	54042.38
2008	62.5465	4791898	1	184.33	8.81	63316.12
2009	78.4983	5476873	0	221.12	1.43	28332.78
2010	83.8017	6295663	0	244.12	-0.1	42959.14
2011	85.5017	7074570	0	293.39	8.28	28018.15
2012	92.5805	8254210	0	322.53	-0.07	38011.4

Table 1.2

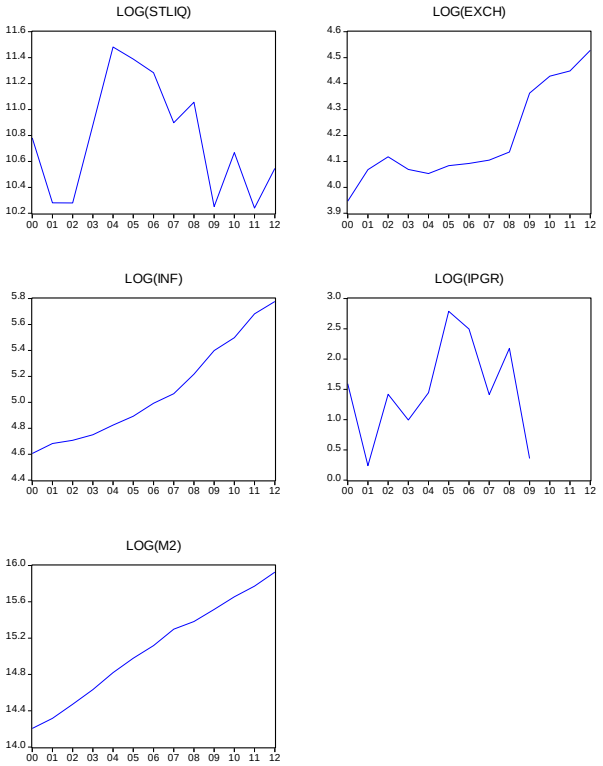

Table 1.3

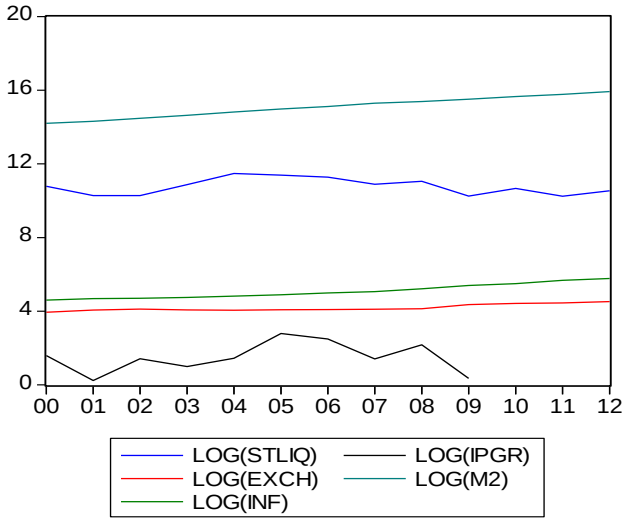

Table 1.4