



**Impact of Stock Prices on Macroeconomic Variables:
Evidence from Pakistan**

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Abstract

It is considered that a stock market of any country is a predictor of economic variables. Changes in stock market reflect in future economic activities. Pakistani stock markets are generally criticized by the various analysts that they are not based on true fundamentals and behave on speculations. It has seen in the past that on different occasions the stock markets observes major decline in conditions when the economy was showing upward trend and vice versa. This particular study intended to identify the basis of Pakistani stock market and its ability to predict about the economy. The aims are to study those variables that determine the role of stock market in economy. Previous studies have shown almost the same results that, there are no long term effects of stock prices on macroeconomic variables. Stock Prices is our independent variable, Whereas, Imports and Exports of Goods and Services are dependent variable for this research. Regression analysis is used to test the hypothesis. Secondary data is obtained from stock market, Federal Board of Revenue and from State Bank of Pakistan (www.sbp.org.pk). Sample period consists of 5-year period beginning at the start of 2005 and ending at the close of 2009. There are different stock markets working in Pakistan but the focus of this research is Karachi Stock Exchange (KSE) which is considers as a biggest stock market from all aspects. The results suggested that there is a relationship between fluctuation of stock prices and the economic indicators and hence in Pakistani scenario it can be said that Pakistani stock markets are also the true predictor of economic activities.

Keywords: Imports of Goods and Services, Exports of Goods and Services, Stock Prices

JEL Classification: A20, A21

Introduction

Observers believe that stock market plays its role in economy as barometer; it has traditionally been viewed as an indicator or predictor of the economy. Many believe that large decrease in stock prices is reflective of future recession, whereas increase in the stock prices suggests the economic growth which means stock market presents itself as an indicator of economic activity.

Another relationship focuses on the possible impact of stock market is on demand, specifically through consumption and investment. The impact generates when people see decline in share prices. If the decline is significant it will directly and strongly affect the financial position. They might be anyone, small investors or giants. And once they start losing their wealth in stocks then they may be more afraid to spend money; and this behavior leads to decrease in consumer prices.

A study done by Fazal (2001) find out the changes in the stock market, may cause of fluctuation in macroeconomic variables, e.g. Increase or decrease the consumption expenditure or Investment spending, gross domestic Product (GDP) and the effect of stock markets development on employment. Higher stock prices can stimulate consumption spending by increasing the wealth of the consumers and higher stock prices can also stimulate investment spending by enabling firms to raise their funds more effectively by issuing Initial Public offering (IPO). Decreasing in share prices can creates problems on firm's ability to increase its financing from stock market. Companies who want to raise their equity through Initial public offering (IPO); face much difficulty because of bad performance of stock market. The reason is that, investors fell hesitant to invest due to uncertainty if the market is on decreasing trend or there is any financial crisis in country.

IMPACT OF STOCK PRICES ON MACROECONOMIC VARIABLES

Study made by Henry (2002) to know about stock market prediction ability on GDP growth, and findings suggests that stock market has predictive power. The corresponding regression in that article confirms the statically significant relation between these two variables.

Stock markets can also affect investor's confidence. As discussed earlier many believe that movement in stock prices reflects economic conditions. Ferreira (2007) confirms it in the context of European market that the authority of financial systems on growth, as well as the efforts of financial institutions to adapt to the new conditions of the European and global markets in spite of all the differences in the past evolution and initial circumstances among EU member states .

Recent decline in stock prices of Karachi Stock Exchange (KSE) indicates a recession in our economy. Bad news regarding decreasing stock prices is one of the major psychological impacts that discourage investors from spending. Often people who ready to take risk and purchase shares are ready to lose wealth; and their spending independent of stock prices because they really don't care of short term losses.

Many researchers include Pakistanis were focused to check the relationship of stock with major economic variables like Gross Domestic Product (GDP), Gross National Product (GNP), Investments, unemployment and Inflation (CPI) in recent years. This thesis is distinctive in a way that we use to test stock with imports and exports of Goods and Services of Pakistan.

It is very important to know about Karachi Stock Exchange's (KSE) role as a leading indicator of Pakistan imports and exports. Because a large number of experts here in Pakistan criticize stock market due to its irregularity by rumors which destroy its role as a predictor to economy. A number of times here in Pakistan it happens when economic figures shows

IMPACT OF STOCK PRICES ON MACROECONOMIC VARIABLES

upward trend but the news coming from stock market was horrible especially for small investors.

Stock market's of Pakistan sometimes predict well about the future of economy, as we have seen in 2007, the decrease in stock prices leads to a recession in economy. But in 2005, the crash in Karachi stock market didn't able to hit economic variables, and generated "False Signals" about the economy, so therefore, how should we rely on stock market as predictor / Indicator? Do the stock markets be symbols of institutions that influence on macro economic variables hence serve as some kind of signals? (Pethe & Ajit, 2000).

The main reason to investigate about stock's role in economy is that, fluctuations in stock prices/markets may not have appropriate impact on economic variables. Share prices can rise/fall without creating impact on economy or by economy.

Problem statement

The stock prices are reliable to predict macroeconomic variables as well as stock market fluctuations.

Research Question:

Do the stock markets influence on economic variables or are they (economic variables) affected by fluctuation of stock prices?

Hypotheses

H1: Exports and imports are Co-integrated.

H2: The past values of stock prices predicts the current fluctuation in stock prices

H3: The past values of stock prices predict the current fluctuation in exports activities.

H4: The past values of stock prices predict the current fluctuation in imports activities.

Literature review

Relationship between stock market and macro economic variables, focus on the relationship of stock prices with consumption expenditure, investment spending and economic activity. The economic activity generally measure by Gross Domestic Product (GDP) and/or Index of Industrial production.

Relationship between stock prices and consumption expenditures which based on the life cycle theory developed by Ando and Modigliani (1963), states that individuals base their consumption decision on their expected lifetime wealth. Part of their wealth may be held in the form of stocks linking stock price changes to changes in consumption expenditure. Thus, an increase in stock prices increases the expected wealth, which, in turn, increases the consumption expenditures, suggesting the direction of causality from stock prices to consumption expenditures. On the other hand, an increase in consumption expenditures may result in an increase in the corporate sector's earnings, which results in higher stock prices, implying causality from consumption expenditures to stock prices.

The relationship between stock prices and investment spending which based on the q theory of Tobin (1969), where q is the ratio of total market value of firms to the replacement cost of their existing capital stock at current prices. According to the theory, the firms can increase their capital stocks if q is greater than one, implying that the market value of firms is expected to rise by more than the cost of additional physical capital. Thus an increase in stock prices may result in an increase in the market value of firms, implying that firms would increase their capital stocks reflecting an increase in investment spending.

Another link, though less direct, between stock prices and investment spending is based on the neoclassical or cost-of-capital model. The model assumes that firms first determine the desired stock of real capital on the basis of prices of labor, capital, and

IMPACT OF STOCK PRICES ON MACROECONOMIC VARIABLES

expected sales and then determine the rate of investment depending on how fast they wish to reach the desired capital stock in the face of significant adjustment cost. Thus, the expected changes in sales and planned output are the major factors affecting investments. However, as noted by Bosworth (1975), if higher earnings are implied by higher expected output that increases stock prices, then the market valuation model implicitly accounts for the effect of expected output. Finally, the relationship between stock prices and economic activity is investigated to examine whether the stock market leads or lags economic activity.

Moreover, the relationship of stock prices with the components of aggregate demand, consumption, and investment sometimes provide conflicting results, causing an ambiguity concerning the direction of causality between stock price changes and macro variables. As mentioned above, the economic activity is generally measured by GDP and/or IIP.

Fazal (2001) proposes that Pakistani stock markets are not that much developed to play their role in influencing on aggregate demand. The lifecycle hypothesis and Tobin's q theory, which provide the basis of linkages between stock prices and consumption and investment expenditures respectively, do not seem to be valid in the context of Pakistan.

Another important but most worrying feature of Pakistani stock markets is that, they cannot be characterized as the leading indicator of economic activity. A study clearly indicates that it lags economic activity. It can be said that individuals, institutions, and government should be aware of speculative bubbles. In the absence of other strong economic indicators, shooting up of stock prices should be dealt with care.

Regardless of Pakistani market, International economies also do not have that much influence by stock prices.

IMPACT OF STOCK PRICES ON MACROECONOMIC VARIABLES

Atesoglu (2002) also mentioned in that fluctuations in stock prices should not have an appreciable impact on the economy should not however rule out the possibility that favorable developments in stock prices can trigger a pessimistic or an optimistic economic development and alter long term expectations. Same in the case of Pakistan because our stock market is highly speculative market and can't have much impact on economy.

Park (1997) defines the same effect of macroeconomic variables on stock returns. Stock's reaction to an economic variable reflects the variable's effects on future corporate cash flows and inflation. Stock returns were found to be related most negatively with employment growth and most positively with GDP.

Study conducted by Christos (2004) mentioned that there is no correlation among current value and the past values, and therefore, the stock returns and inflation are characterized as independent factors in Greece market. And hence, the researcher also finds evidence of no long run relationship between the two variables. As discussed earlier stock market in Pakistan is not that much developed yet to plays its role in economy, so it needs improvements to match macro economic variables.

Jain (1988) discuss that there is a strong impact of economic news/Information on stock prices, which reflected in a reactively short period of 1 hour. The advantage to use hourly stock returns data in research projects investigating the effects of announcements of economic variables. Same situation have seen many times in Pakistan where stock market responds quickly too because of economic announcements e.g. Monetary policy. That carries interest rates which directly relates to the stock markets and the major players of market are also keen to know about new developments in such macro economic variables.

Studies made by Sara and Levine (1996) investigate about the role of financial system in economic growth. In this regard the research found that the predetermined component of

IMPACT OF STOCK PRICES ON MACROECONOMIC VARIABLES

stock market development is positively associated with economic growth. The cross country growth regression involves a strong link between stock market development and economic growth.

Another study made by Levine (1997) uses existing theory of goldsmith (1969) which acknowledged the relationship between financial and economic development. The research suggests through analysis, which includes firm level, individual country level, industry level and broad cross country level comparisons, which explain a strong positive relationship between financial system and economic growth in long run.

Both Sara and Levine (1998) work together again to investigate whether measure of stock market liquidity, size, volatility and integration with world capital markets are robustly associated with economic variables such as current and future rate of economic growth, productivity improvements, capital accumulation and saving rates of 47 different countries.

The study gives empirical proof on the most important theoretical debates about the association between stock markets and long term economic growth.

The research studied the empirical relationship between various measures of stock development, banking development and long run economic growth. And find that after controlling for many factors associated with growth, stock market liquidity and banking development are both positively and robustly correlated with at the same time and future's economic growth rate, productivity and capital accumulation.

Research done by Braun and Borja in (2005) finds the performance of companies during recessions. The paper shows that those companies which are more dependent on

IMPACT OF STOCK PRICES ON MACROECONOMIC VARIABLES

external financing hits harder during recessions specially when they are located in countries with poor financial contractibility, and when their assets are less protective of financier.

Rajan and Luigi (1998) finds whether the developments in financial sector facilitate economic growth by scrutinize one foundation for such an association that financial development decreases the costs of firms which is externally finance. Particularly, research find whether sector which is relates to industrial development that are comparatively extra in necessitate of external finance develop excessively faster in countries with more urbanized financial markets.

The research findings may bear on three different areas of current research. First, it suggest that financial development has a substantial supportive influence on the rate of economic growth Second, in the context of the literature on financial constraints, the research provides fresh evidence that financial market imperfections have an impact on investment and growth.

Finally, in the context of the trade literature, the findings suggest a potential explanation for the pattern of industry specialization across countries. The level of financial development can also be a factor in determining the size composition of an industry as well as its concentration.

Nagaishi (1999) find out the answer of stock markets positive role in the process of economic growth in the context of Indian market. The investigation results indicate that so far as the function of domestic savings mobilization is concerned, Indian stock market development form 1980s inwards has not played a prominent role, secondly, if there is further deregulation of the stock market to attract more foreign portfolio inflows into India, there seems to be no way to avoid similar problems as Mexico, Korea and Thailand such as more volatile movement of domestic stock prices. Lastly bank credit to the commercial sector has

IMPACT OF STOCK PRICES ON MACROECONOMIC VARIABLES

no positive correlation ship with indicators of stock market developments. These findings indicate that the fundamental relation between stock markets and economic growth is at least so far a fond hope in the Indian context.

Ann and Lyigun (2004) observe the relation between incomes in aggregate consumption growth. In high income countries, greater income inequality appears to be associated with more volatility in consumption growth; on the other hand countries having low income, high levels of inequality in income tend to be associated with less volatility. Research presents evidence that variability in real GDP growth is also related to income inequality in the same way. The results suggest that countries with low income, having high level of inequality associated with lesser fluctuations in consumption growth, and those who have high income, have more inequality seems to b associated with greater fluctuations. Some preliminary results indicate that financial development may help to explain the relationship between inequality and aggregate consumption variability.

Odedokun (1998) attempted to identify whether financial intermediation affects economic growth, and also for determining the channels by which any affects it may have on growth. Study aims at enhance the earlier ones and, especially, at suggesting a new framework for evaluating the role of financial intermediation and applying the framework to actual data for developing countries.

The findings suggests, Growth of financial aggregates in real terms have positive impacts on economic growth of developing countries. Financial aggregates in relation to overall economic activities or GDP, promotes economic growth in the low-income developing countries but has no perceptible effect in the high-income developing countries. The combined effects of financial intermediation, which are externality and intersectional factor productivity differential effects, on economic growth are significantly positive.

IMPACT OF STOCK PRICES ON MACROECONOMIC VARIABLES

Liow, Muhammad and Huang (2005) investigate the relationship between the expected risk premiums on property stocks and having some main macroeconomic risk factors which are reflected in financial conditions and in general business at international level.

Findings suggest that predicted risk premium and conditional instabilities of the risk premium on property stocks are time unreliable and energetically linked to the conditional instabilities of main macro economics risk factors. Though there are some differences in significance, as well as path of impact in the macro economics risk factors across the property stocks.

Research Methodology

Data Collection

Secondary data is the main source to collect the data for this research. The data is collected from websites of concerned variables. Also include various visits to State bank and Karachi stock exchange for knowledge form experts to check the relationship between variables.

Sampling Size

The sample period used in this study covers 5-years period beginning at the start of 2005 and ending at the close of 2009. Quarterly data of 5-years is used and hence sample size containing of 60 observations for each variable.

Research Models

Model 1: Imports = $\alpha + \beta$ (stock prices)

Model 2: Exports = $\alpha + \beta$ (stock prices)

Model 3: Δ Stock Prices = $\alpha + \text{lag}_1$ Stock Prices

Model 4: Δ Exports = $\alpha + \text{lag}_1$ Stock Prices

Model 5: Δ Imports = $\alpha + \text{lag}_1$ Stock Prices

IMPACT OF STOCK PRICES ON MACROECONOMIC VARIABLES

Five models have been developed in this study, import and exports are the main variables whereas in one model lag of stock prices is also a dependent variable and the independent variables remains same which is stock prices. Lags are also taken of stock prices to predict the the dependent variables in 3 of the models mentioned above.

Statistical tool used

Econometrics techniques are used to test our hypotheses. As we have two different dependent variables but one same independent variable. To check the association between these two dependent variables we use seemingly unrelated estimation, and to check the association between above two models we used Co-integration. Empirical research in macroeconomics as well as in financial sector is largely based on time series. Since the thesis contains financial and macroeconomic variables, so we used Co-integration which is an econometric property of time series variables and is used to tests our hypotheses.

Finding and Interpretation of the Results

Vector error correction estimates

Sample (adjusted) 460

Table 1:

Co-integrating Eq:	CointEq1
STOCKS (-1)	1.000000
EXPORTS (-1)	-115.1309 (28.5612) [-4.03102]
IMPORTS (-1)	14.17036 (9.40193) [1.50718]
@TREND (1)	531.8664

IMPACT OF STOCK PRICES ON MACROECONOMIC VARIABLES

	(222.112)		
	[2.39459]		
C	140451.2		
<hr/>			
ERROR correction:	D (STOCKS)	D (EXPORTS)	D (IMPORTS)
<hr/>			
CointEq1	0.026157	0.006629	-0.000690
	(0.00884)	(0.00237)	(0.00401)
	[2.95757]	[2.79795]	[-0.17212]

Econometrics models:

Model 1: Imports = $\alpha + \beta$ (stock prices)

Model 2: Exports = $\alpha + \beta$ (stock prices)

We used seemingly unrelated estimation (*SURE*) to check association between above two models. Since the results showing that significant value of Trend reports 531.8664 at $t = 2.39459$, which is greater than 1.5, which means there is an association between these two models, and hence *SURE* is required.

Co-Integration interpretations for models:

Model 3: Δ Stock Prices = $\alpha + \text{lag}_1$ Stock Prices

Stocks are found significant through econometrics results. Since the significant value is greater than 1.5 which is 2.95757, which means changes in previous months Stock prices will be cause of fluctuations in next months Stock prices.

Model 4: Δ Exports = $\alpha + \text{lag}_1$ Stock Prices

Exports are also found significant through econometrics results. As we have 2.79795 which is greater than 1.5 explaining that movements in previous months stock prices will be cause of fluctuations in next month exports of goods and services of Pakistan.

Model 5: Δ Imports = $\alpha + \text{lag}_1$ Stock Prices

IMPACT OF STOCK PRICES ON MACROECONOMIC VARIABLES

The model is found insignificant because value is less than 1.5 which is -0.17212 which means movements in previous stock prices are not explaining next month imports of goods and services of Pakistan.

The effect of fluctuation of stock prices movement have been found impressive with respective of exports of goods and services of Pakistan. As the econometrics results have shown that movements in previous month's stock prices are caused of fluctuations in next month exports of goods and services of Pakistan. The past values of stock prices are proved to be responsible in fluctuation of current stock prices. Which means our H2 and H3 are accepted. The hypothesis H4 is rejected because t value is less than 1.5 which is -0.17212 which means movements in previous stock prices are not explaining next month's imports of goods and services of Pakistan. This research also investigates the association between dependent variables through results we came to know that seemingly unrelated estimation (SUR) is required because trend reports 531.8664 at $t = 2.39459$, which is greater than 1.5, which means there is an association between these two models, and hence SURE is required.

Conclusion

Based on the results it is concluded for this research that the past values of stock prices predicts the current fluctuation in stock prices and the past values of stock prices predict the current fluctuation in exports activities while the past values of stock prices have no impact on current values of imports or past values of stock prices are not predicting the current fluctuation in imports activities. So, hypotheses H2 and H3 are accepted while H4 is rejected in this research.

Recommendations

This research tries to explore the market which is very unpredictable and stock markets of Pakistan are criticized due to its uncertain behavior. This thesis provides

IMPACT OF STOCK PRICES ON MACROECONOMIC VARIABLES

opportunity to those researchers who want to check the relationship or you can say interdependence between stock market and economic variables especially in the context of Pakistan. Although exports of Pakistan are lesser than imports but still this research proves that previous month's stock prices are caused of fluctuations in next month exports of goods and services of Pakistan and provide chance for future researcher because Pakistan's exports may increase than imports and balance of payment shifts towards positive and hence that research will be more interesting. This thesis also helps to those learners who are keen to know about stock involvement or its impact in the movement of economic variables.

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