The Relationship between Consumer Price Index and Producer Price Index with Financial Performance

Saeid khodamoradi

Assistant Professor of Management Department, Shahed University, Iran,Tehran,

Tel:09123175284

saeed379@yahoo.com

Mohammad Saadatmand

MA in Business Management of Shahed University, Iran,Tehran

Tel:09177724358

m.saadat65@gmail.com

Abstract

Managers in a stock exchange should possess a criterion thereby they evaluate their performance. Two criteria can be used for performance evaluation: accounting criteria and economic criteria. Consumer and producer price indices are those factors influencing financial performance. These indices show change in products and services purchased by households and producers. Current study attempts to investigate the relationship between consumer price index and producer price index with accounting criteria of financial performance evaluation. Statistical population comprises listed firms in Tehran Stock Exchange during 2002-2010. Sample size is 132 firms. Inferential statistics were used for data analysis. Results indicated that financial performance is indirectly related to consumer price index and directly related to producer price index.

Keywords: Consumer price index, producer price index, financial performance, stock return, Tehran Stock Exchange

JEL code: E44

1. Introduction

Most economists argue that firm managers in a stock exchange should have a criterion based on which they evaluate their performance. In addition, they need criterion for evaluating various economic plans. Determining and introducing the most appropriate criterion for performance evaluation for everyone or every organizational unit in firms with different activities is a function of two factors: main strategy of firm and actions performed by individuals in these units toward the main strategy realization.
Two kinds of criteria can be used for evaluating performance: accounting criteria of performance evaluation (including rate of return, return on equity, dividend per share, stock returns) and economic criteria of performance evaluation (including economic value added, market value added, adjusted economic added value). One of the most

common performance evaluation criteria is those based on accounting models. In fact, these criteria are among the major indices for evaluating performance of managers and used by stock holders for examining status of firms. One of the factors influencing on financial performance evaluation are price indices such as consumer price index (CPI) and producer price index (PPI). CPI or goods and service price index is one of the most important price indices for measuring inflation rate and purchasing power of domestic currency. It measures changes in products and service prices purchased by households or customers.

Producer price index specifies price change received monthly by producer for its producers. It is highly associated with the market, and it is closely considered as an index of current inflation level. These indices often are followed narrowly since investors seek for inflation pressure signs, which may change an interest rate (Bittencourt, 2010). In the current study, it is attempted to investigate the relationship between consumer price index and producer price index with financial performance of listed firms in Tehran Stock Exchange during 2002-2010.

2. Review of Literature

Diaz (2009) studied relationship between inflation (CPI) and stock return and dividend per share in Spain. He found that the impact of inflation on stock return and dividend per share depends on potential intervening factors such as risk-free interest rate, future growth expectations and risk premiums. He also found that there is significant positive relationship between inflation and stock return and dividend per share when there is bad news (actual inflation rate is higher than expected rates of inflation) and there is an indirect relationship when there is good news (actual inflation rate is lower than expected rates of inflation) (Diaz, 2009).

Sharma (2011) investigated an effect of tendencies of Board of Directors and general economic conditions on the amount of profit per share using data from 944 public firms in 2006. He found an out tendency of Board of Directors to increase or fix profit per share decreases by an increase in CPI (inflation) thus profit per share reduces, that is, CPI (inflation) is inversely proportionate with profit per share (Vineeta, 2011).

Walter Lane (2006) compared USA and Europe inflation regarding CPI. He introduced an experimental CPI for USA, which was matched with European CPI. America CPI is different from Europe's in two respects. One is rural population, and the other is being housed owner. He showed that CPI has lower inflation effect in USA compared to Europe as well as the lower effect on America's firms' profitability compared to European (Lane, 2006).

Williams (2008) proposed a model for investigating an impact of access to internet service on CPI. This model directly investigated internet service price impact on CPI and subsequently Inflation. Finally, they concluded that internet service access has the positive impact on CPI (Williams, 2008).

3. Research Hypotheses

3.1. First Main Hypothesis

There is a relationship between consumer price index (CPI) and financial performance.

3.2. Second Main Hypothesis

There is a relationship between producer price index (PPI) and financial performance.

3.3. Secondary Hypotheses

There is a relationship between consumer price index (CPI) and return on equity.

There is a relationship between consumer price index (CPI) and return on assets.

There is a relationship between consumer price index (CPI) and stock return.

There is a relationship between consumer price index (CPI) and dividend per share.

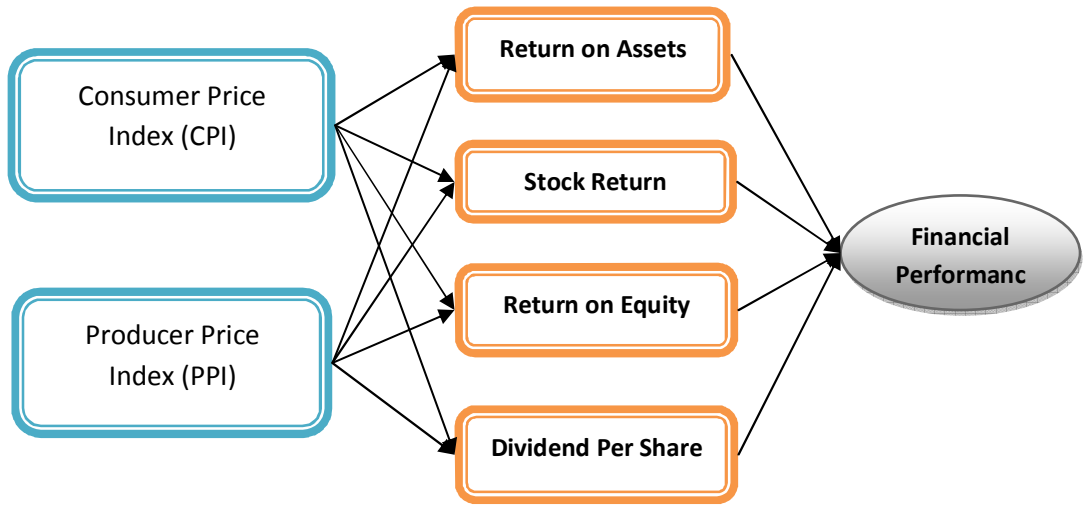
There is a relationship between producer price index (PPI) and return on equity.

There is a relationship between producer price index (PPI) and return on assets.

There is a relationship between producer price index (PPI) and stock return.

There is a relationship between producer price index (PPI) and dividend per share.

4. Conceptual Model



5. Statistical Population and Sampling

The statistical population consists of a group of people or objects, which are common in one property or properties being investigated and related to the subject (Garner et al., 2009). The statistical population for this study includes firms accepted in Tehran Stock Exchange with following conditions:

-All firms should be in the stock exchange from beginning of the year 2002 until end of the year 2010

-Their information should be fully accessible

-Insurance, banks and investment firms are eliminated.

Considering above-mentioned conditions, 200 firms were included in the statistical population.

In determining sample size, P or success ratio in population was considered as 0.50 so that it is insured that highest size is calculated, thus sample size with supposed limited statistical population was calculated using sampling formulae in confidence level 0.95.

$$n = \frac{N(Z_{\alpha/2})^2.pq}{(N-1)d^2 + \left(Z_{\alpha/2}\right)^2.pq} \quad , \quad \boldsymbol{n = \frac{200\times(1.96)^2\times0.5\times0.5}{(199)\times(0.05)^2+(1.96)^2\times0.5\times0.5} = 132}$$

6. Theoretical Framework

6.1. Dependent Variables

6.1.1. Stock Return

Currently, the main criterion for performance evaluation is usually stock return rate. It contains information for investors and is used for evaluating performance. When it is reduced, it means a warn for the firm and show inappropriate performance for the firm. This criterion contains much information because it reflects performance evaluation based on market value and investor's information. Return is a dynamic in investors' process, which generates motivation and is considered as a reward for investors. Total return means profits belonging to the share over the whole year.

Seasonal return of Tehran Stock Exchange was regarded as a dependent variable in this study. A firm return is calculated as follows:

$$R = \frac{(P_{t+1} + P_t)+D}{P_t}$$

R = stock return, Pt+1 = stock price by the end of month, Pt = stock price in the beginning of the month, D = dividend or other takes.

Thus, stock return during a given period can be extracted just using stock value in beginning and end of the period.

6.1.2.Return on Equity (ROE)

Return on equity is one of the financial ratios obtained from profit before tax divided by equity and represents stock returns to shareholders. This ratio is calculated based on total annual net profit after tax to sum of common equity at the end of fiscal year. Return on equity is calculated for every year.

$$\text{Debt ratio} = \frac{\text{total debt}}{\text{total asset}} \quad , \quad \text{Return on equity} = \frac{\text{return on assets}}{\text{debt ratio}-1}$$

6.1.3.Dividend per Share (DPS)

It indicates the percent of annual profit, which is divided among common shareholders. This ratio is important both for shareholders and creditors. Shareholders emphasize that this ratio is specified as high so that their cash share of profit in increased, while creditors and dept holders tend and emphasize that it is specified as low so that the firm has enough cash flow in order to repayment of debt principal and interest without any problem, and they also confine the firm in this regard in their loan contracts. This ratio presents the firm's profit sharing policy. If one is subtracted from the ratio, percent of the firm's retained earnings is obtained (Fabozzi & etc., 2003).

$$DPS = \frac{\textbf{firm divided}}{\textbf{the number of ordinary shares}}$$

6.1.4.Return on Asset (ROA)

Return on assets is one of the profitability ratios which evaluate total performance of the firm and amount, and the way of firm profitability will be analyzed. Return on asset calculates return on assets which is used. The more this ratio, the higher profit is gained from used assets (Fabozzi & etc., 2003). It shows the profit per every Rial of investment. This ratio implicitly states that merely investment is not important rather profit gained by the firm is important, and it is the return along with other factors, which makes the value for a shareholder (Fabozzi et al., 2003).

ROA = profit margin * asset turnover

6.2. Independent Variables

6.2.1.Producer Price Index (PPI)

Producer price index specifies price change received monthly by producer for its producers. Data are determined using polls in various sectors, including production, agriculture, mining and urban service. Producer price index is highly associated with the market, and it is closely considered as an index of current inflation level. Like other price indices, increase in its value may show an increase in an interest rate which is considered for the inflation fight (Blanchard, 2000).

In addition, it should be noted that PPI report is the first report of inflation measurement accessible monthly. Hence, it is followed narrowly since investors seek for inflation pressure signs, which may change the interest rate (Huang & Lin, 2010).

Producer price index is usually published before consumer price index and attracts close attention since observers use PPI as part of CPI assessment. PPI report has an average impact on the market (Economist, 2008). If investors feel that PPI values (without the concern of immediate rising interest rates) are signs of strong economy, then they expect increased activity in the stock exchange..

6.2.2.Consumer Price Index (CPI)

Consumer price index measures change in products and services purchased by households or customers. CPI is defined by United States Department of Labor Statistics as follows: CPI is the measurement of average price change in price paid by customers over time for products and services provided for them (Abel, 2005). In order to select products and services, which are the basis for measurement, first importance factor of products and services are calculated using results of household budget investigation. Then, considering the weight and their pricing capacity they are put in the calculation portfolio. Product and service price index has three exclusive groups and eight main groups.

CPI can be used as an index (regulatory index of inflation effect, for example) of the real value of benefits, salary, and pension, to set prices and to reduce the amount of money for representing that these changes have real values (Blanchard, 2000).

Goods portfolio change price of which is considered in this index include consuming goods, which are important for urban households. Importance factor calculation for each good in household consumption portfolio and goods' average prices are critical in accurateness of index calculation since they are the calculation basis. Importance factor or weight of goods is obtained from household budget investigation. Bases for these factors are updated annually, but relative price calculation for a good or service is what should be determined regarding each goods and is calculated through arithmetic mean or geometric mean. Difference between these means may be

insignificant in each good (product or service), however, in the whole goods sum of these differences provide considerable difference (Castelnuovo, 2010).

Generally, below relationship is used for index calculation:

$$\text{CPI} = \frac{\text{day price}}{\text{basic price}} * 100$$

7. **Methodology**

The basis for every science is the method of understanding it and value and reputation of laws of every science is based on methodology used in that science. Methodology is a set of rules, tools and valid (reliable) and systematic ways for investigating facts, discovering unknown and achieving problem solving (Garner et al., 2009) In this study, first reliability or unreliability of time series is examined using unit root test. To this end, Augmented Dicky- Fuller test is used. Then, since it's probable that there is serial correlation in time series, Phillips-Perron test is used. Pearson's correlation is used for investigating the relationship between two variables and Granger's causality test is used for investigating variable's influence and influence time. Data provided by Central Bank of Islamic Republic of Iran, and Tehran Stock Exchange Organization were used in this study..

8. Testing Hypotheses

8.1. Time Series Reliability

Since the study is of time series type, and it is extracted from time-series data and because ordinary least square's method was used for estimation in hypotheses and prerequisite for using a linear regression model in ordinary least squares, method is reliability of pattern variables, it is necessary to perform reliability and unreliability test for research variables. To this end, augmented Dickey-Fuller test (ADF) was used. The optimal intervals for Dicky Fuller test were specified using Schwar Info Criterion, so that the interval with highest Schwar value would be the best one (Ghysels et al., 2001).

H0 and H1 hypotheses are as follows:

H0: respective variable has a unit roots.

H1: respective variable doesn't have unit root (statement of a stasis conditions for the variable) Results for Dicky Fuller test at variable's level are given in table 1.

Regarding Prob value for all variables, H0 is supported, that is, these variables have unit root, and thus they are not static. Variables should be stabilized by higher-order differential. Therefore, Dicky Fuller test was applied for a difference of first order of model variables. Augmented Dicky Fuller test results for first-order differential of variables are given in table 2.

Therefore, regarding ADF test results on first-order difference of model variables' values, H0 is rejected and H1 is accepted implying model variables are static. All variables follow the inert process in difference and are first-order inert. Thus, all variables of the model became inert by once difference. According to econometric concepts, existence of serial correlation leads to incorrect estimations of the standard error and thus, wrong incorrect statistical inference for equation factors. Since serial correlation is probable in these time series, Phillips–Perron test is used. It is used for determining a statistic conditions of a time series when serial correlation is probable in time series. Hence two hypotheses are introduced:

H0: variable has the unit roots (it is not static)

H1: variable doesn't have to root unit (it is static)

Results for Phillips–Perron tests at variable's level are given in table 3.

Regarding Prob value for all variables, H0 is supported, that is, these variables have unit root, and thus they are not static. Variables should be stabilized by higher-order differential. Therefore, Phillips-Perron test was applied for a difference of first order of model variables. Phillips-Perron test results for first-order differential of variables are given in table 4. Therefore, regarding Phillips-Perron test results from it is shown that H0 is rejected and H1 is supported implying that model variables are static.

8.2. Testing Hypotheses

Correlation is a statistical tool to determine the type and degree of correlation between a quantitative variable with another one. Correlation coefficient is one of the criteria used in determining correlation between two variables. Correlation coefficient shows severity and direction (direct or inverse) relationship. In this study, Pearson's correlation coefficient is used regarding the data type. This coefficient calculates the correlation between two interval or relative variables. Results for investigation of relationship between variables are given in table 5. Considering at table 5, it is concluded that return on equity (R = -0.71), return on assets (R = -0.66), stock return (R = -0.37) and dividend per share (R = -0.68) have indirect relationship with CPI. In addition, return on equity (R = 0.62), return on assets (R = 0.59), stock return (R = 0.41) and dividend per share (R = 0.70) have significant direct relationship with PPI. Then Granger's causality test is used for investigating variable's influence and influence time.

Granger's test defines X causality in Y regarding Y predictability, and Y will be caused of the X if prior values of the Y decrease X predictability error (Ghysels et al., 2001). In this study, Granger's causality test was used following finding correlation between variables in order to examine their influence and delay period. Results of Granger's causality test are summarized in table 6.

Regarding results, it is clear that CPI influences on return on equity, stock return and dividend per share, however, this effect happens with one year of delay. That is, CPI influences on stock return, return on equity and dividend per share in future year, and it doesn't influence on them in current year, and they were influenced by last year CPI. In addition, PPI influences on return on asset without delay.

PPI influences on return on equity and stock return, however, this effect happens with one year of delay. In influences on return on asset and dividend per share without delay, that is, they are influenced by this index in the current year. Considering 4 first hypotheses, it is approved that CPI has significant negative relationship with firm financial performance, and regarding four latter hypotheses, it is approved that PPI has significant positive relationship with firm financial performance.

9. Conclusion and Suggestions

First to fourth secondary hypotheses were approved that there is significant correlation between these indices. That is, return on equity with one-year delay, return on assets without delay, stock return with one-year delay, and dividend per share with one-year delay are in relationship with CPI. Therefore, first main hypothesis, that is the relationship between CPI and financial performance, is approved. It means there is negative relationship between financial performance and CPI. In other words, there is negative correlation between CPI and financial performance. Fifth to eighth secondary hypotheses were approved implying there is significant correlation between these indices. That is, return on equity with one-year delay, return on assets without delay, stock return with one-year delay, and dividend per share with one-year delay are in relationship with PPI. Therefore, s main hypothesis, that is the relationship between PPI and financial performance, is approved. There is positive relationship between financial

performance and PPI. In other words, it can be said that there is positive correlation between PPI and financial performance.
In first hypothesis, relationship between CPI and return on equity was investigated. It was found that they have inverse relationship. In addition, CPI influences on return on equity with one-year delay. It can be attributed to decreased return on asset, which has been decreased because of the increase in CPI, which leads to decrease in return on equity. It is suggested that investors predict stock return considering this index in future year and provide stocks of firms, which give higher return.

In second hypothesis, relationship between return on asset and CPI was investigated, which have indirect relationship. This leads to reduction in return on equity, which was considered in first hypothesis. The reason for reduction in return on asset can be the reduction in firm net profit due to increased price indices. In order to prevent from this matter, managers can adjust this effect by increasing activity and variety and increase return on equity by increasing operational profit in addition to return on asset.

Relationship between stock return and CPI was studied in third hypothesis. It was found there is inverse relationship between CPI and stock return. Regarding findings, since CPI influences with one-year delay, shareholders can predict the effect of current-year CPI (inflation) on the next year stock return. Managers can increase dividend per share and reduce retained earnings in order to decrease the effect of CPI on their stock return so that they adjust this effect and eliminate return reduction news, which is a bad news for the firm. Some previous studies found inverse relationship between stock return and CPI (inflation), and some didn't find any specific relationship between them.
Relationship between dividend per share and CPI was studied in fourth hypothesis, which was an inverse one. It can be related to third hypothesis where operational profit and stock return decrease because of the increase in CPI, and finally, it leads to reduction in dividend per share. One way for compensating this reduction is considering operational costs. Operational profit can be increased by reduction in operational costs such as administrative costs, personnel costs, and also plans to reduce production costs so that retained earnings and dividend per share are increased.
Relationship between return on equity, return on asset, stock return and dividend per share with PPI was investigated in fifth to eight's hypotheses. Unlike our expectation, there was a positive relationship. One reason for it is an increase in good price higher than the increase in PPI. That is, increase in raw material price increases PPI and the firm has to increase its product price, but this price increase is more than the increase in raw material price so that firm profitability is increased.

Meanwhile, it might sell (demand) is decreased but this decrease is lower than a price increase (here comes the discussion of price elasticity of demand). When there is an increase in PPI, it is suggested that retained earnings and dividend per share is reduced, and it is spent on raw material purchase and increased activity. Increased activities in the current year may reduce operational profit but return on equity. Return on asset, stock return and dividend profit are increased in the next year due to increased operational profit.

In our study, it was found that CPI has inverse relationship, and PPI have direct relationship with financial performance. It was concluded that these indices influence on financial performance. Results of this study are in consistency with previous works such as Diaz (2009), Sharma (2011), and are not consistent with findings of some studies such as Graham (1996), and Jung (1997), which showed no relationship between inflation and financial performance, especially between stock return and dividend per share.

References

- Fabozzi F, Peterson P, Peterson P. 2003. Financial management and analysis. Second Edition. John Wiley and Sons.
- Bidram, R. 2003. Consistent with econometrics. Tehran: Manshur Bahre Publication. 1st Ed.
- Garner, Claire Wagner C, Kawulich B. 2009. Teaching research methods in the social sciences. Ashgate Publishing, Ltd., Sep 21
- Arlin,M.1987. time variability in mastery learning. American Educational Research Journal,21,103-120
- Ghysels E, Osborn D. 2001. The Econometric Analysis of Seasonal Time Series. Cambridge University Press
- Abel A.2005. Macroeconomics (5th ed)
- Díaz A.2009. Explanatory factors of the inflation news impact on stock. Research in International Business and Finance 23 ، 349–.368
- Williams.B 2008. a hedonic model for Internet access service in the Consumer Price Index
- Castelnuovo.E 2010. Tracking U.S. inflation expectations with domestic and global indicators. Journal of International Money and Finance 1340-1356
- Graham.F 1996. Inflation Real Stock Returns and Monetary Policy. Applied Financial Economics .
- Huang H and Lin.S 2010. Inflation and the finance–growth nexus. Economic Modelling ،229–236.
- Bittencourt.M 2010. Inflation and financial development: Evidence from Brazil. Economic Modelling ،0-9
- Blanchard.O 2000. Macroeconomics (2nd ed).Prentice Hall: Englewood Cliffs, N.J.
- Sharma V. 2011. Independent directors and the propensity to pay dividends. Journal of Corporate Finance 17 ، 1001–1015.
- The Economist. 2008. Volume 387, May 31 - June 6 2008, page 109.
- Lane.W 2006. Comparing U.S. and European inflation: the CPI and the HICP. Monthly Labor Review ،20-27.

Tables

Table 1. Dicky Fuller test results for pattern variables

Variables	The number of appropriate intervals	Intercept	Trend	Augmented Dickey-Fuller test statistic	MacKinnon critical values			Prob
					1%	5%	10%	
CPI	Level	+	+	1.395	-3.61	-2.94	-2.609	0.998
PPI	Level	+	+	1.907	-3.62	-2.94	-2.619	0.999
Return	Level	+	+	-1.5479	-3.61	-2.93	-2.601	0.499
DPS	Level	+	+	-2.146	-3.61	-2.941	-2.609	0.228
ROA	Level	+	+	-0.153	-3.63	-2.948	-2.612	0.935
ROE	Level	+	+	-2.347	-3.61	-2.938	-2.607	0.162

Table 2. Dicky Fuller test results for first order difference of variables

Variables	The number of appropriate intervals	Intercept	Trend	Augmented Dickey-Fuller test statistic	MacKinnon critical values			Prob
					1%	5%	10%	
CPI	1	+	+	-3.096	-3.615	-2.941	-2.609	0.035
PPI	1	+	+	-3.036	-3.631	-2.943	-2.610	0.004
Return	1	+	+	-6.605	-3.615	-2.941	-2.609	0.000
DPS	1	+	+	-7.204	-3.621	-2.943	-2.610	0.000
ROA	1	+	+	-5.234	-3.632	-2.948	-2.612	0.001
ROE	1	+	+	-5.150	-3.632	-2.948	-2.612	0.002

Table 3. Phillips-Perron test results

Variables	The number of appropriate intervals	Intercept	Trend	Phillips-Perron test statistic	Test critical values			Prob
					1%	5%	10%	
CPI	Level	+	+	5.64	-4.58	-3.32	-2.80	1.000
PPI	Level	+	+	4.01	-4.58	-3.32	-2.80	1.000
Return	Level	+	+	-1.34	-4.58	-3.32	-2.80	0.55
DPS	Level	+	+	-2.34	-4.58	-3.32	-2.80	0.18
ROA	Level	+	+	-9.93	-4.58	-3.32	-2.80	0.0001
ROE	Level	+	+	-2.33	-4.58	-3.32	-2.80	0.18

Table 4. Phillips-Perron test results with once difference

Variables	The number of appropriate intervals	Intercept	Trend	Phillips-Perron test statistic	Test critical values			Prob
					1%	5%	10%	
CPI	1	+	+	-1.43	-4.80	-3.40	-2.84	0.044
PPI	1	+	+	-1.35	-4.80	-3.40	-2.84	0.05
Return	1	+	+	-1.2	-4.80	-3.40	-2.84	0.048
DPS	1	+	+	-2.94	-4.80	-3.40	-2.84	0.05
ROA	1	+	+	-9.932	-4.80	-3.34	-2.84	0.0001
ROE	1	+	+	-1.108	-4.80	-3.40	-2.84	0.044

Table 5. Results of variables' correlation coefficient

No.	Hypothesis (H_0)	Correlation Coefficient	t-Statistic	Probability	Rejection or Support
1	There is relationship between consumer price index (CPI) and return on equity.	-0.711	-5.86	0.0006	H_0 rejection
2	There is relationship between consumer price index (CPI) and return on assets.	-0.677	-4.6	0.0025	H_0 rejection
3	There is relationship between consumer price index (CPI) and stock return.	-0.373	-1.06	0.0216	H_0 rejection
4	There is relationship between consumer price index (CPI) and dividend per share.	-0.683	-4.98	0.0016	H_0 rejection
5	There is relationship between producer price index (PPI)	0.629	6.64	0.0003	H_0 rejection

	and return on equity.				
6	There is relationship between producer price index (PPI) and return on assets.	0.594	5.3	0.0011	H_0 rejection
7	There is relationship between producer price index (PPI) and stock return.	0.417	1.21	0.0434	H_0 rejection
8	There is relationship between producer price index (PPI) and dividend per share.	0.706	5.686	0.0007	H_0 rejection

Table 6. Granger causality test results

	Delay Number	One-Year Delay		Two-Year Delay		Three-Year Delay		H_0 Support or Rejection
1		F-Statistic	Prob	F-Statistic	Prob	F-Statistic	Prob	
	There is relationship between consumer price index (CPI) and return on equity.	0.029	0.04	3.63	0.21	3.01	0.14	One-year delay, H_0 rejection
2	There is relationship between consumer price index (CPI) and return on assets.	17.80	0.043	0.0055	0.04	17.80	0.053	No delay, H_0 rejection
3	There is relationship between consumer price index (CPI) and stock return.	67.09	0.01	0.007	0.93	59.09	0.145	One-year delay, H_0 rejection
4	There is relationship between consumer price index (CPI) and dividend per share.	0.078	0.01	0.04	0.96	0.09	0.245	One-year delay, H_0 rejection

5	There is relationship between producer price index (PPI) and return on equity.	12.40	0.07	0.12	0.74	12.45	0.044	One-year delay, H_0 rejection
6	There is relationship between producer price index (PPI) and return on assets.	0.0014	0.04	9.14	0.0021	0.055	0.034	No delay, H_0 rejection
7	There is relationship between producer price index (PPI) and stock return.	1.9	0.04	2.96	0.252	1.77	0.173	One-year delay, H_0 rejection
8	There is relationship between producer price index (PPI) and dividend per share.	1.022	0.003	1.082	0.001	1.11	0.04	No delay, H_0 rejection