Investigation the Effect of Economic Variables on Stock Price Index
(Evidence from Pharmacy Firms Listed Stock Exchange Organization of Tehran)

Ali Sorayaei, Ali Yadollahzadeh Tabari and Goli Rezghi Rami

1Member of Faculty, Islamic Azad University, Babol, Iran
2Business of Management, Islamic Azad University, Babol, Iran

Abstract: Purpose of this research, is to study relation between economic macro variables (Inflation Rate, Exchange Rate, Cash Liquidity Growth and Rate of internal gross production growth) and stock price index of pharmacy companies accepted in Tehran Stocks from year 2005-2009. Financial data related to 29 pharmacy companies that accepted in Tehran stocks, are from RahavardNovin software and economic data are from General Department of Central Bank. In order to analysis relation between economic macro variables on stock price index, regression method used in this research, is regression with panel data. Results of this research show that there aren’t any relation between economic macro variables of inflation rate with stock price index and there are relation between exchange rate variables, liquidity growth rate and growth rate of internal gross production with stock price index.

Key words: Exchange rate · Inflation rate · Liquidity growth rate · Growth rate of internal gross production · Price index

INTRODUCTION

Human beings always seek for ways to arrive more welfare and comfort and they confront with various aspects of their life such as cultural, social, political and economic. It’s obvious that if human beings can have more knowledge and awareness about these dimensions, their success in this course shall be smoother. Unerring one of more important dimensions is economic that composed of various parts and having enough knowledge about this, can be helpful to welfare life of human beings.

Meantime, capital market, as a one of more important Processes that we try to solve problems by that, is called basis of economic, nowadays has an important and Realization. Noticeable effect on proper forming and directing of Research is implicate some activities that thought countries capitals and can through this can help to human properly and perform carefully. Research includes search, societies economic growth. So more studies and survey, test and examination processes. These processes researches in capital markets, can cause to more efficiency and growth of these markets and finally economic efflorescence of human societies. In general nowadays our environment, is changing with increasing speed and every day some new ideas are in emersion. Speedy changes in one hand and transactions that are in various dimensions of human being life in the other hand, caused people faced with complicated categories in their decisions and studying various issues. Meantime technological developments cause various events moreover internal impact, effect on various aspects of international political, economic, social and cultural courses. So what is absolute is that in order to good analysis of one phenomenon, shall take care well to above mentioned changes and interaction. So nowadays peruse each phenomenon and decision about this, is related to implicate many variables and factors that are effective on that phenomenon, both in internal and external level. [1] Processes that we try to solve problems by that, is called Realization.

Research is implicate some activities that thought properly and perform carefully. Research includes search, survey, test and examination processes. These processes shall be performed in the careful, critical, visual and logical manner, final result includes new realities discovery that help us to face with problem [2].

The purpose of this research is study of economic macro variables effect (inflation rate, growth rate, GDP, liquidity growth rate and exchange rate changes on stock price index changes accepted in Tehran stock.

Corresponding Author: Ali Sorayaei, Member of Faculty, Islamic Azad University, Babol, Iran.
Theoretical Fundamentals and Research History:

Inflation: Some people in inflation definition, take care to inflation cause and others take care to its effects and some others to increase prices, but as mentioned before, in summary, inflation consist of stability in prices increase. Really, inflation is due to conditions that general level of prices increase, in irregular or disproportion manner and continuously. Of course we should care that in the economic that approximate increase in prices (P), is equal to mean of productive increase or final output of work (MP_s) and money wage (W_m) increase at the same ratio, in form that real wage rate \[
\frac{W_m}{P}
\] in employer balance condition, like this:

\[\text{MP}_{c} = \frac{W_m}{P}\]  \hspace{1cm} (1)

Remains fixed, although prices has increased, but inflation doesn’t happen. In this case, increase in general wage levels, that caused by manpower productive or output, become invalid. In this condition, inflation will not take place in its real meaning and real output of persons, don’t be affected in contrary manner, so normal increase in prices after one course of economic fall, isn’t inflation [3].

Inflation Effect on Investment and Stock Price:

Generally, inflation as a one of more effective factors in financial and economic decision making and investment, has a very important role and investors, take special care to inflation rate in financial markets, because net profits of investment is dependant to inflation rate, when in time between investment and exploitation, prices go up, the money that investor achieved as his investment profit, has a low power to purchase and thereupon real output of investment shall be less than expecting output, that express inflation risk. Risk of Changes in general level of prices, recognized as a purchasing power risk. Indeedity when general level of prices increase, means that with fixed amount of financial property, we can buy little good, In the other words, inflation means decrease in power of financial properties toward real properties. Indeed return, it can account by this [3].

\[R = \frac{1 + \text{Nr}}{1 + I} - 1\]  \hspace{1cm} (2)

\(R\):real returns, \(\text{Nr}\):inflation rate.

As you see in Equation 2, there are inverse relation between inflation rate and real output and inflation increase (decrease) shall be accompany with real output rate decrease (increase). In one hand because of decrease indeed output rate to expected output rate and in the other hand, because people should pay more money to purchase goods and services and as a result, saving and final desire, shall decrease. So because of inflation, intention to investment shall decrease too, (because people’s investment take place from their saving) and this will damage to investment development, about inflation effect on stock price, we can reason as below:

\[K = K_r + \text{risk premium}\]  \hspace{1cm} (3)

In equation (3), K is market output rate or same nominal output rate, \(K_r\), is riskless output rate and risk premium including default risk premium, liquidity premium and maturity risk premium. \(K_e\) or riskless output rate composed of 2 parts, one is \(K^*\) or real profit rate that results of riskless stocks rate with expected inflation rate 0 and other is an inflation premium. So whatever inflation increases, then premium related to it shall increase and market output rate shall increase. Based on capital asset pricing model (CAPM), increase in K RF cause equal increase in output rate of all of risk properties. Because inflation premium interfere in expected output rate structure f risk and riskless properties. Hence, inflation rate increase and following it, increase in market output rate, stockholders expecting output rate, shall increase of investment in stock. [4] in the other hand, according to below formula that is the same sphere formula in evaluation stock price:

\[V_0 = \frac{D_1}{K - g}\]  \hspace{1cm} (4)

\(V_0\): property value in current time, D, expecting dividing profit at the end of current period, K: expecting output rate and g: benefit growth rate

It appears that, there are contrary relation between expecting output rate (K) with property price (\(V_0\)), so when stockholder expecting output rate increase, stock price will decrease. Of course, this often in short time and in long term, stock price increase again, because of stock profit increase.

Gross Domestic Production (GDP): Generally, gross domestic production consists of goods value and final services produced in geographical borders and inside one country, during one particular period, without care to this if account goods and services, produced by that country’s domestic factors or not. Almost Gross Domestic Production account in three manner including: 1) Production method, 2) income method, 3) expenditure,method [5].
In the manufacture method to account gross domestic production, add final value of all of goods and produced services by producing institutes that its sum called “National Production”. Good and services production bring wage, salary, rent and profit for family. Second method for measurement gross domestic production is adding all of these incomes that its outcome called “National Income”. In the third method, goods and services sale value is considering that its outcome is called “National Expenditure”. Because three method of gross domestic production should be resulted, then

\[
\text{National Production} = \text{National Income} = \text{National Expediency} \quad (5)
\]

**Effect of GDP Effects on Investment and Stock Price:**
Equations 6, 7, express national production and national income, respectfully:

\[
Y_1 = C+S
\quad (6)
\]

\[
Y_2 = C+I
\quad (7)
\]

C: national use, S: National saving and I: National investment

According to equation (5), \( Y_1, Y_2 \) should be equal so as a result of this, according to that use factor is common in both equations:

\[
Y_1 = Y_2 \Rightarrow C + S = C + I \Rightarrow S = I \quad (8)
\]

According to above mentioned relations, it’s clear that finally national income or production will be used or saved or invested. So we can reason that if national production (income) increase, only doesn’t cause to use increase and saving increase too, then sum of national investment shall increase too and this investment can take place in untrue economic parts such as financial and monetary markets such as stock market and cause more prosper for them.

\[
\text{National Production} = \text{National Expediency}
\]

And we expressed in the other hand that national expediencies implies to good and services sale value. Hence, with national increase, indeed, national expediencies or same economic institutes sale volume will increase too. Increase in sale volume of institutes, their profit will increase and following it, dividing profit of each stock shall increase. According to Gordon equation that mentioned before, there are direct relation between dividing profit and stock price, so stock price shall increase. These relations can be shown as below [5].

Gross Domestic Production ↑ Sale Volume ↑ EPS ↑ P ↑

**Liquidity Volume:** Liquidity was defined as a basic variables of macroeconomics, in form of total money and likeness money. As you saw, liquidity is not only money (banknote, coins and current savings), but also it includes likeness money such as (saving deposits and time credits to banks). Even nowadays main part of liquidity in modern economics, there aren’t bank bill and coins at all, but there are deposits that is saving by banks. [5].

In spite of type of liquidity and its formation, important and vital effect of liquidity volume in society, in update economics, is important. Liquidity volume in society can bring long-term and short time effects on various parts of economic such as housing market, capital, good and services. Indeed decrease or increase in money presentation in society, can cause prosper or slump in production, employment, investment and finally economic. so we will study effect of liquidity volume on investment and stock price, in the next part [3].

**Effects of Changes in Liquidity Volume on Investment and Stock Price:** To show effect of liquidity volume (money representation) on investment, 3rd factor is used named Interest Rate. Generally, according to Money Demand Theory, when money representation decreases, cause interest rate increase, with increase of interest rate and lack of reasoning most of investment projects, total investment shall decrease, these relations summarized as follows:

\[
M_s \downarrow \rightarrow r \uparrow \rightarrow I \downarrow
\]

In addition, according to positive relation between investment and national production and if investment decreases, national production shall decrease, in the other word:

\[
I \downarrow \rightarrow Y \downarrow
\]

So we can see that change in money representation can cause change in investment in various parts of economic such as stock market and brings growth or
depression. About liquidity importance, as an effective factor in stock price change, we can reason as follows:

To survey effect of money representation on normal stock price, we consider stock as a one property that its output granted to stockholders during the time. Present value of expecting incomes account as follows:

$$PV\sum_{t=0}^{\infty} \frac{D_t(1+g)^t}{(1+r_t+P)^t}$$ (9)

In above mentioned equation, PV: is present value of future incomes, $D_t$: dividing profit at the end of previous period, $g_t$: expecting growth rate of profit on time $r_t$:riskless interest rate, $P_t$: premium risk that sum of $r_t + P$, shows interest rate or stockholder’s expecting output rate. According to above equation, it’s clear that there are 3 important factor in determining normal stock price: expecting growth rate of dividing profit, riskless interest rate and risk premium. Now we will show that money representation has positive relation with dividing profit growth rate also has negative relation with riskless interest rate and risk premium. As a result, stock price, shall have positive relation with money representation. Effect of money representation on dividing profits, caused by money representation on current and future incomes of companies. As mentioned previously, according to money demand theory, decrease in money representation, will cause to interest rates increase and this cause decrease in expenses that are sensitive to interest rate. Part of these expenses is sum that paid for investment. Investment Decrease,at last, cause to decrease sale and companies’ profit. We should declare that maybe dividing profit will not change notably, according to liquidity status, but finally decrease in profit of total company, cause to decrease its dividing profit. Although stock’s current price, will decrease according to dividing profit decrease, but liquidity volume shall affect on dividing profit growth rate, because investors prospects will change according to effect of money representation on exchange price of changed stock and following that prospect growth rate will change [6].

**Exchange Rate:** We defined exchange rate as a price of monetary unit of one state, in the other word, exchange rate is rate that a country’s money is exchanged with other country’s money. Exchange rate after disintegration of Berton Vodez monetary systems in the first of 1970s, changed to buoyant exchange. Buoyant exchange rate, is a rate that is determined in market by demand and exposition and without governments hand. Sometimes governments in order to prevent of damages which severe is of exchange rate, start to stable exchange rate in short-time and long term, by policies that commonly between exchange rate fluctuations in long term is called flat. Exchange rate determination. In any case by determining exchange rate in free markets, international economic shall involve noticeable fluctuations and these fluctuations challenges modern economics. It’s normal that various parts of economic, specially parts that have direct relation with other countries, will affected by these fluctuations and because of this exchange rate can takes into account as an effective and key factor in financial and economic studying. In the following part and according to exchange rate importance also subject of research, we shall survey exchange rate importance in relation with economic institutes and market [5].

**Effect of Exchange Rate Changes on Stock Price:** After fragmentation of a Berton Woods monetary system, in the first of 1970s and states use of buoyant exchange rate, there happened noticeable fluctuations in equivalency of states exchanges and these fluctuations, challenged various parts of economic including economic institutes. Generally exchange fluctuations affected on cash flows of companies and cause fluctuations of companies values that is exchange rate risk concept. Exchange rate risk, not only is related to range of companies involving in international operations, but also is relevant to state economic structure, rank of opening, flexibility and sensibility of internal debts and credits in front of exchange rate.

All of companies specially those have international operations, is disposal to exchange rate risk. Even our company has not any kind of international operations and has not any direct relation with foreign countries, is disposal to exchange rate fluctuations too. As an example, one companies recourses suppliers may have foreign rivals, or a network relevant to foreign that this shall affect on exchange rate risk of company.

Generally exchange rate changes can: 1) change foreign companies rivalry conditions in front of domestic importers and exporters. 2) cause changes in price of import raw materials, in pricing international markets. 3) change conditions and payments out of exports to issue companies. 4) change foreign properties and debts value to national exchange, 5) cause change in incomes, costs and profits of institute [7].
Stock Price Index: The most common start point of investor while purchase, is stock of study stock price process. This price is affected by two factors: first factors which affect on particular stock and another are factors that shall affect on total stock market. In the capital market, 2nd factor is recognized as a market risk. Stock price indexes and more than, these indexes changes, show risk rank of these indexes in capital market [8].

Index Definition: The word Index, means diagram, pointer and representor. In application point of view, the index is quantity that shows some coordinate variables. Index is means for measurement and comparison of phenomenons which have distinct identity and particularity. So we can study changes in determined variables during a period, based on index [7].

Exchange Index: Exchange index, as like as thermometer shows capital market status and economic status of country. Generally, index decrease, means economic inactivity and its increase means economic prosper.

- We can measure total or partial output of market and compare it with other Portfoys, following this, portfolio’s risk can be compared with index risk too.
- Stock price, almost is expects of economic status market of companies. Hence, market indexes are indicators of future national economic status and operation. Usually, market researchers use market indexes to study factors that affects stock price movement. Also studying movement process of exchange market, this market investment output shall be evaluate with other investment opportunities such as investment in properties and real states, gold, exchange and so on.
- Other interested group to indexes, are technical analyzers. They believe that historical changes in prices, can predict their movements. For example, in order to prediction of stock price movement in future, they draw diagram for price and changes volume in stock market [7].

Stocks price index in Tehran: Stocks price index in Tehran started in 1990 and is recognized named Tipex (Tehran Price Index) in international level. According to Tehran stock price index is accounting in a balance form, based on diffused stocks current value, so shows stock current value. Accounting formula for Tehran stock price index based on Laspirez formula consists of:

\[
TEPIX = \frac{\text{current value of the issued shares of listed companies} \times 100}{\text{base value of the issued shares of listed companies}}
\]

In this formula, number 100, is base number and its date is 21 March 1990. Numerator is multiple of all of diffused stocks in stocks last price and then total of stock value. Denominator shows total value of diffused stock base that is result of multiple of all of diffused stocks of companies which are members of basic price (21 March 1990) in the other word, index accounting formula, based on mathematicians formula is as follows: [7]

\[
TEPIX = \frac{\sum_{i=1}^{n} P_{it}}{\sum_{i=1}^{n} P_{O} Q_{io}}
\]

n: Number of accepted Companies, O : base, P_{it}: price of stock i in time t, I : number of stocks of I Company in time t, P_{O}: stock I Price in time O, Q_{io}: number of stocks of I company in time O, BASEVALUE=100.

Alam & Uddin, [9]: studied exchange market for 15 developed and developing countries by monthly data, during (1988-2003). They tested market output perpetuity and concluded that none of these markets aren’t proficient even in simple form. Also their study result showed that interest rate has a negative effect on stock price index in all of countries.

Pascal Nguyen,[10]: studied economic macro factors effect on Japan industries risk. And concluded that domestic industries are sensitive to GDP changes while related industries risk to exports is sensitive more to exchange rates. Also domestic industries are sensitive more to GDP changes while risk of industries based on exports are relevant more to exchange rate.


MericasVemrica, [12]: performed research named “analyzed, in order to restudy of Fama continuum hypothesis of stock output reaction to real economic variables in German”. so findings show that stock market reaction to economic variables, is reflect of variables effects on inflation and these findings are coordinate with Fama continuum hypothesis.
Ding Diu (2006),[13]: studied relation between stock output and inflation in vector regression frame in America. Findings showed that there are positive relation between stock output and inflation, because of monetary politics reason in periods, while negative relation between stock output and inflation between 1954-1974, caused by efficiency shocks that are relatively important in this period.

Piraei and Shahsavar, [8]: studied effect of economic macro variables on Iran exchange market during 1971-2006. To this aim, they used season data of stocks index of Tehran, gross domestic production, money volume, inflation rate and exchange rate. These researchers used self description method with distributing pauses. Their evaluation results showed that stock price index has direct relation with gross domestic production and general level of priced and has inverse relation with money volume and exchange rate. Also shows Model error correction coefficient. In any period 15% of lack of existent balance, removed that is indicator of high speed of balance.

Najarzadeh, Khondabi and Reaeipour [14]: studied effect of exchange rate and inflation rate on Tehran stock price index in carrier of 2003-2006 and using monthly statistics of variables. They used in their study of vector self description (VAR), Immediate Reaction Function (IRF) and Variance Dissection (VD). Results shows that there are meaningful long-term balance relation between stock price index and real exchange rate and inflation rate and shocks caused by inflation rate and exchange rate on stock price index has a negative effect in long term and has positive effect in short time. Of course effect of shocks caused by exchange rate is more intensive.

Research Hypotheses:
Main Hypothesis: There are meaningful relation, between economic macro variables and stock price index of pharmacy companies which were accepted in stock organization.

Secondary Hypothesis:
- There are meaningful relation between general level of prices (inflation rate) and stock price index of pharmacy companies, which were accepted in stock organization.
- There are meaningful relation between exchange rate (percentage of exchange rate changes) and stock price index of pharmacy companies which were accepted in stock organization.
- There are meaningful relation between Liquidity volume (Liquidity volume growth rate) and stock price index of pharmacy companies which were accepted in stock organization.
- There are meaningful relation between gross domestic production rate (growth rate of GDP) and stock price index of pharmacy companies which were accepted in stock organization.

Research Hypothesis Test Stages: After achieving to dependent and independent variables in order to data analysis, multi variable regression method is applied that for this aim, Eviews software is used and is as follows:

Panel Data: Panel data is expression to mixture states, institutes and families provisional observations, during some years. So in econometric literature, statistic information related to attached data from provisional and time series is called panel data, means, data related to one or more variables in special period and for some various resources. Sometimes it’s not possible to separate data in a provisional manner, or their incorporation may result better than one by one method. In this condition, using incorporative data is popular.

Test F: What is discussed in panel modes is : suppose there are n separate decision that are numbered by index i from 1 to n and t is period of regular time, so we have: N= it, if panel linear regression s as follows:

\[ Y_{it} = \alpha_i + \beta_1 X_{1it} + \beta_2 X_{2it} + \ldots + \beta_k X_{kit} + e_{it} \]

Variables consist of:
- \( Y_{it} \): dependant variable value for i in time t
- \( X_{jt} \): descriptive variable value J for i in time t

I= 1,...,n
j= 1,...,k

in this regression, general system of all units is expressed in all times. Difference between sections (institutes, states, roads, provinces etc.) is shown in \( \alpha_i \) and it supposed fixed during the time. If we suppose that \( \alpha_i \) is fixed for all of institutes, OLS method will result efficient and comparable estimations of \( \beta, \alpha \), but if we suppose that there are difference between various sections, panel data manner is used for estimation.
In order to determine existence or (lack) of separated width for all of states, statistic $F$ is used as follows:

Zero hypothesis expresses that $\alpha 1$ is fixed for all of institutes and OLS method can be applied:

$$H_0: \alpha_0 = \alpha_1 = ... = \alpha_n = \alpha$$

$$H_1: \alpha_i \neq \alpha_j$$

$$F(n-1, nt-n-k) = \frac{(RSS_{UR} - RSS_R) / (n-1)}{(1 - RSS_{UR}) / (nt-n-k)}$$

In above equation, UR shows non-bound model and R shows bound model with one fixed statement for all of groups. $K$, number of descriptive variables, protected in model, $n$ number of countries, $N=nt$, total observations and $t$ is time period. If accounted $F$ is grater than $F$ of table with freedom range of $(n-1), (nt-n-k)$, then zero hypothesis shall be null, so bound regression shall not be valid and it should be accounted various widths.

**Hasman Test:** If $F$ test of $H_0$ hypothesis fails in front of $H_1$, now this question discuss that which is correct specification? And model in which frames of fixed effects model and random effects model can be expressed. To test this applying of fixed or random effects model evaluates, is used of Hasman test.

$$H_0: \text{Random Effects}$$

$$H_1: \text{Fixed Effects}$$

$$H = n \tilde{q} \left( \text{Var}\left( \tilde{q} \right) \right)^{-1} \tilde{q}$$

That:

$\tilde{q}$ : difference of efficiency evaluated for descriptive variables in fixed and random effects method

$$\left( \tilde{q} = \tilde{\beta}_{FE} - \tilde{\beta}_{RE} \right)$$

$\text{Var}(\tilde{q})$ : lateral Variance $\tilde{q}$

$n$ : number of observations

**Hypothesis Test:** There are meaningful relation between economic macro variables and stock price index of pharmacy companies which are accepted in stock organization

In order to survey relation between economic macro variables and stock price index, of pharmacy companies accepted in stock organization, this linear regression model is used:

$$y_{it} = \beta_0 + \beta_1 \text{INFR}_{it} + \beta_2 \text{GDPGR}_{it} + \beta_3 \text{MSGR}_{it} + \beta_4 \text{PCER}_{it} + \epsilon_{it}$$

**Test Suppositions:**

$H_0$: there aren’t meaningful relation between economic macro variables and stock price index of pharmacy companies accepted in Tehran stock.

$H_1$: There are meaningful relation between economic macro variables and stock price index of pharmacy companies accepted in Tehran stock.

$$H_0: \beta = 0 \ \ \ \ \text{prob} \geq 0.05$$

$$H_1: \beta = 0 \ \ \ \ \text{prob} \geq 0.05$$

**First supposition Test:** To first supposition test, initially this analysis was determined that test is in form of incorporative model or fixed effects. $F$ test Statistics was accounted like below:

In Table 1, according to in $F$ test, because $\text{prob} < 0.05$, test is random or fixed. To determine that, we use Hasman Test.

**Results of Hasman Test:**

**Relation Between Economic Macro Variables and Stock Price Index:** To study effects of economic macro variables (exchange rate, inflation rate, liquidity growth rate, gross domestic production growth rate) and stock price index using panel data and Eviews software are as follows:

**Results and Description of Research Hypothesis:**

**First Supposition:** Therearen’t any meaningful relation between general level of prices(inflation rate) and stock price index of pharmacy companies accepted in stock organization.

In accordance to Table 3, between inflation rate and stock price index with statistic efficiency of $1.700960$ and $\text{prob} 0.1404$, because is more than $5\%$, isn’t meaningful.

**Second Supposition:** There are meaningful relation between exchange rate (percentage of exchange rate changes) and stock price index of pharmacy companies accepted in stock organization.

According to Table 3 between exchange rate and stock price rate with $t 4.225289$, $\text{Prob}$ is equal to $0.0000$, is meaningful, because is less than $5\%$. This variable efficiency is $200.7919$ and shows that it has direct relation
Table 1: Selection between incorporative model and fixed effects

<table>
<thead>
<tr>
<th>Description</th>
<th>Sum of Statistic</th>
<th>Freedom Degree</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-section F</td>
<td>3.530889</td>
<td>28</td>
<td>0.0000</td>
</tr>
<tr>
<td>Cross-section Chi-square</td>
<td>91.744221</td>
<td>28</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Table 2: Hasman Test

<table>
<thead>
<tr>
<th>Description</th>
<th>Sum of Statistic</th>
<th>Freedom Degree</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-section random</td>
<td>13.436052</td>
<td>4</td>
<td>0.0093</td>
</tr>
</tbody>
</table>

According to Hasman Test, prob<0.05, so fixed effects(fixed) method shall be used.

Table 3: Composition Regression Test Results

<table>
<thead>
<tr>
<th>Dependent Variable: Stock Price Index</th>
<th>p- Value</th>
<th>t Statistic</th>
<th>Efficiency</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0001</td>
<td>-4.029505</td>
<td>-1196.114</td>
<td>Price Index</td>
<td></td>
</tr>
<tr>
<td>0.1404</td>
<td>1.484782</td>
<td>1.709960</td>
<td>Inflation Rate</td>
<td></td>
</tr>
<tr>
<td>0.0000</td>
<td>4.225289</td>
<td>200.7919</td>
<td>Exchange Rate</td>
<td></td>
</tr>
<tr>
<td>0.0028</td>
<td>3.058257</td>
<td>38.78839</td>
<td>Liquidy Growth Rate</td>
<td></td>
</tr>
<tr>
<td>0.0162</td>
<td>-2.442229</td>
<td>-108.8701</td>
<td>Gross Domestic Production Growth Rate</td>
<td></td>
</tr>
<tr>
<td>Vatson Camera</td>
<td>3.544893</td>
<td>F-statistics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.0000000</td>
<td>0.503186</td>
<td>R-squared</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.36239</td>
<td>Adjusted</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In general research model of relation between dependent and independent variables summarized as follows:

\[ y_{it} = \beta_0 + 1.700960INF_{it} - 108.8701GDPGR_{it} + 38.78839MSGR_{it} + 200.7979PCER_{it} + \epsilon_{it} \]

Sign of inflation rate variable is positive according to theoretical expect but it’s not meaningful(of course, it’s meaningful in border form or Boardline, to some extent. Because these changes are in level 86% and near to 95 %, it’s not important, although it doesn’t have high meaning, it should have more caution.

**REFERENCE**