

RELATIONSHIP BETWEEN STOCK RETURNS AND MACROECONOMIC VARIABLES: A STUDY OF BEVERAGE AND FOOD COMPANIES LISTED ON THE SHENZHEN STOCK EXCHANGE, CHINA

Rui Tan¹

Abstract: *The securities market in China is one of the world's most promising emerging markets. It played a significant role during the 2008 economic crisis. As a result, how to grasp good investment opportunities in the stock market has become a heated topic. With this background in mind, the researcher conducted an empirical test using time series data methodology to study the relationship between macroeconomics and stock returns. This paper is based on the index of the Beverage and Food Industry issued by the Shenzhen Stock Exchange (SSE) from 2005 to 2009 (monthly data was collected over a 60-month period). It focuses merely on the Beverage and Food industry returns and looks at nine macroeconomic variables, namely, money supply (M2), inflation rate (CPI), foreign exchange reserves, raw oil price, industrial production index, import rate, export rate, gold price and consumers' confidence index. On the basis of the multiple regression analysis (OLS) carried out by Eviews 5 program, the results show that three independent variables—foreign exchange reserves, gold price and consumer confidence index, all have a significant positive relationship with stock returns at Sig. 5% and Sig. 10% levels. It is thus suggested that these three independent variables be the “new pecking order” for stock returns of the Beverage and Food firms listed on the SSE.*

Keywords: *Arbitrage Pricing Theory, Beverage and Food Industry, Macroeconomic variables, Shenzhen Stock Exchange.*

Introduction

As the saying goes, the stock market is the barometer of business. Stocks reflect how the economy performs at any given time.

Economists have divided the economy into three categories based on their economic behaviours: macroeconomics, mesoeconomics, and microeconomics. Each own risk factors which affect stock prices and account for the variations in stock returns. As Li (2007) argued, stock prices are determined by these three economic environments. This study focuses on the macroeconomic environment. A stock market is a good tool for assessing the macroeconomic environment, which affects the performance of firms. To some degree, investment performance and opportunities are determined by the conditions of the macroeconomic environment. been used to explain the macroeconomic environment. Key economic factors, such as inflation, money supply, and interest rates to name a few, have

In developed countries, the performance of the stock markets is seen as one of the key elements reflecting the performance level of their economic activities. This raises the question of whether all stock market behaviours come in line with the macroeconomic factors.

Stock market cycles are determined by economic cycles. A change of economic cycle appears when the stock market cycle is altered, thereby demonstrating an apparent cyclical relationship between stock market and economic cycle. Generally speaking, falling stock market prices signal an economic recession. Conversely, a rise of the stock prices points to a steady and uplifted recovery of the economy. When stock prices reach an all-time high, it shows that the economy is extremely healthy and business booming.

China is no exception to this cyclical relationship. How its stock markets fare rests largely on macroeconomic trends. The Chinese security market is an important component of the national economic structure. Moreover, the stock market relies on a healthy macroeconomic environment for its growth. There are times, however, when

¹Rui Tan recently graduated from Assumption University, Graduate School of Business. This research was completed under the supervision of Dr. Ismail, the Program Director.

macroeconomic trends go against changes in the stock market.

China's first stock exchange was founded by foreign businessmen and was named the "Shanghai Sharebrokers' Association". In light of the reforms and opening policy of the early 1980s, the stock market saw a positive development in line with the healthy economic growth then experienced. In 1991, the Shenzhen Stock Exchange Market (SSE), the 9th largest stock exchange in Asia by market capitalisation in 2008, was established (http://en.wikipedia.org/wiki/Shenzhen_stock_exchange#cite_note-data.)

The constant economic improvement and rising productivity have allowed the Central Bank of China to adopt a more liberal and flexible policy, which has in turn benefitted investments.

The beverage and food industry emerged at the time of the reforms and opening of China in the late 1970's and early 1980's. The beverage and food industry has been increasing to an average annual rate of 16% and has become one of the fastest growing markets in China. (<http://www.topcj.com/html/3/HGSD/20080109/58774.shtml>). It has demonstrated a decline-resistance ability. In short, the beverage and food industry is a mature market. Nevertheless, there are some problems hindering its development. For example, the market size is relatively small for domestic businesses, monetary support is in shortage, and advance technologies are yet to be developed.

Given these facts, it is also fair to wonder how the stock return of the beverage and food companies listed on the SSE react to changes in the macroeconomic variables. This research focuses on the macroeconomic-based risk factors, the independent variables in this study. The major objective of this paper is not only to find a relationship between some macroeconomic variables and the stock returns of the beverage and food companies listed on the SSE, but also to consider 9 macroeconomic variables: money supply (M_2), inflation rate, foreign exchange reserves, crude oil price, industrial production index, import rate, export rate, gold price and consumer confidence index. It is only by applying an

ordinary least squares (OLS) regression analysis that the significant macroeconomic variables affecting stock returns in the Chinese beverage and food companies listed on the SSE can be identified.

One of the limitations to this research, however, is that it selected only the beverage and food firms listed on the SSE. It thus cannot represent the overall beverage and food companies in China. Another limitation is that it focuses only on the macroeconomic environment, and has excluded the micro-economic and meso-economic environments. In addition, other macroeconomic variables such as the GNP, fed fund rate, term structure, risk premium, and unemployment rate were not considered in this paper due to the shortage of data available.

In spite of these limitations, this research is still considered beneficial to three major parties: investors and shareholders, managers of food and beverage firms, and future researchers. For investors and shareholders, the investment environment can be analyzed according to the risk factors extracted from the macroeconomic environment as illustrated in this paper. For the managers of food and beverage firms, knowing what macroeconomic factors affect the stock market behaviours can be helpful to restructure their financial arrangements to an optimal value. For future researchers, this research can assist them to explore other factors affecting the stock returns and investigate the life cycle of the 2008 economic crisis which also affected China.

This paper will first review the related literature and consider the research framework and methodology. It will then report the findings of the investigation and discuss them.

1. Literature Review

A smart investor has to seek a lot of useful information, both externally and internally about the company he is considering investing in, in order for the investment value to be evaluated properly. One way to do this is to use the stock valuation model, one of tools for selecting stocks and indicating companies with risky returns.

Stock values depend on their future returns, which are determined by dividends and capital gains/losses. Theoretically speaking, stock valuation aims at calculating the required rate of return of the stock; this is the first step towards intelligent investing. Lawrence (2008) defined the meaning of stock valuation as the price or actual value it holds. Future cash flows are financial factors impacting on the current price per share of common stocks. However, future cash flows determined by two key factors are future dividends and future liquidation values, and both factors are unknown; which means that some macroeconomic variables will influence stock valuation, such as inflation rate, interest rate and money supply.

Asset pricing explains how financial assets are priced, why prices change, as well as how they are related to the underlying macro economy. This brings into the picture two of the influential asset pricing theories: the Capital Asset Pricing Model (CAPM) and the Arbitrage Pricing Theory (APT).

- *The Capital Asset Pricing Model (CAPM)*

Introduced by Sharpe in 1964, the CAPM focuses on the relationship between the expected returns and risk on perilous assets. It argues that the optimal portfolio will be a value weighted mix of all the assets in the market. The CAPM serves two basic functions. First, it provides a benchmark rate of return for evaluating possible investments. Secondly, the model helps investors make an educated guess as to the expected return on assets that have not yet been traded in the marketplace.

- *The Arbitrage Pricing Theory (APT)*

The APT was introduced in 1976 by Stephen Ross. The model states that the returns of stock could be modelled as a linear function of different macro-economic factors and financial factors. In financial field, APT is applied as a testable alternative to the CAPM. APT assumes that each stock's return relies on pervasive macroeconomic factors and partly on "error," events that are unique to that company. The APT, a Multi-Factor Model, is applied commonly to test a relationship between macroeconomic variables and stock returns.

In terms of stock valuation, both the CAPM

and APT fail to satisfactorily illustrate stock valuation. The definitive item of the CAPM is unmeasurable and the APT is not critically dependent on an underlying market portfolio as is the CAPM, which predicts that only market risk influences expected returns. Instead, the APT recognizes that several types of risks may affect stock returns Champi (1999).

Both the CAPM and APT rest on the efficient market hypothesis. Today, more and more technical stock market analysts try to find out the best stock investment by examining a whole array of indicators, including past prices, past earnings, records of accomplishment and so on. The major factors impacting security prices are based on investor expectations, not their analyses. Therefore, market can be thought as efficient under the conditions of all available information, which are already reflected on stock prices. However, security prices are mainly based on investor expectations rather than their analyses. At this point, markets can be thought as efficient under the condition of all available information, which is already reflected on security prices.

- *The Efficient Market Hypothesis (EMH)*

EMH has been one of the most fiercely debated topics in the world of modern finance, since it was introduced by Fama in 1965. According to this scholar, during any given time period, security prices fully influence all available information. "An 'efficient' market is defined as a market where there are large numbers of rational, profit-maximizing actively competing, with each trying to predict future market values of individual securities, and where important current information is almost freely available to all participants".

As the stock market chosen for this paper is studied as a whole, it is reasonable to assume that the market is efficient and in an equilibrium state. EMH is also the cornerstone of the modern portfolio theory and the corresponding asset pricing theories (Guo and Xiao, 2004).

Fan and Yu (2002) tested the Three-factor model, introduced by Fama and French (1993). They arrived at the same conclusion that Fama and French: with regard to the

Chinese stock market, the Three-factor model can account for various behaviours between stock indexes and the market itself.

As King's (1966) analysis shows, the market and industry factors model is the starting point of the APT. Macroeconomic factors determine the progress a stock market can make.

In China, the security market is a very important part of the national economic structure. For its development it relies on a healthy macroeconomic environment. Yet, macroeconomic trends can run counter to the change in the stock market. There have been times when macroeconomic factors failed to affect the stock market in the same way; i.e., a positive macroeconomic trend and negative performance of the stock market. Investors can be puzzle when both are separated from each other (Wang, 2005). What the stock performance apt to move in the opposite direction of the macro-economy points out to is that there is no cause-effect relationship between stock returns and macroeconomic factors.

Exploring economic data as systematic factors affecting the U.S. stock market, using monthly data, Chen's, Roll's and Ross' (1986) empirical test indicated that the industrial production, change in risk premium, and inflation during the test periods can significantly account for expected returns when these factors are highly volatile. Not to mention that oil prices, market index and consumption are not priced by the financial market.

Champi's (1999) study on the determinants of the stock return of Thai-prospectd earning of listed companies used six macroeconomic variables, the independent variables, to verify their stock returns. The empirical test revealed that industrial production, change in risk premium, and inflation during the tested periods can largely explain the expected returns due to their high volatility.

Türsoy, Günsel and Rjoub (2008) investigated the empirical applicability of the APT by using macroeconomic variables to price the Istanbul Stock Market. They selected and tested 13 macroeconomic variables to test the APT model as applied to the Istanbul stock

exchange between February 2001 and September 2005 using monthly data.

Their findings show that the macroeconomic variables have no significant effect on stock returns on the Istanbul stock exchange. While a macroeconomic variable may affect one industry positively, another industry may be impacted negatively. Wang and Tian (2009) researched the relationship between consumer confidence index and stock market performance. Their study concluded that consumer sentiment can predict future stock market returns. The consumer confidence index was thus selected as an independent variable for this study.

The nine macroeconomic variables selected for this research come from the following empirical studies.

Table 1: - The Macroeconomic Variables Used as Risk Factors

Macroeconomic Variables	Previous Studies Which Employ Indicated Variables
Money Supply	Champi (1999); Azeez and Yonezawa (2006); Paavola (2006); Liu, Li and Hu (2006); Türsoy, Günsel and Rjoub (2008);
Inflation Rate	Chen, Roll and Ross (1986); Poon and Taylor (1991); Azeez and Yonezawa (2006); Paavola (2006); Liu, Li and Hu (2006); Michailidis, Tsopoglou, Papanastasiou (2007)
Foreign Exchange Reserves	Türsoy, Günsel and Rjoub (2008)
Crude Oil Price	Chen, Roll and Ross (1986); Paavola (2006); Türsoy, Günsel and Rjoub (2008); Champi (1999)
Industrial Production Index	Champi (1999); Chen, Roll and Rose (1986); Fama (1990); Türsoy, Günsel and Rjoub (2008)
Gold Price	Türsoy, Günsel and Rjoub (2008)
Export Rate	Liu, Li and Hu (2006); Türsoy, Günsel and Rjoub (2008)
Import Rate	Liu, Li and Hu (2006); Türsoy, Günsel and Rjoub (2008)
Consumer Confidence Index	Wang and Tian (2009).

Source: created by the researcher for this study

Since the APT does not provide any guidance as to which factors should be used, the researcher picked up the factors suitable to meet the specific purpose of this study. Consideration of some previous studies analyzed in details accounts for the choices made.

Liu, Li and Hu (2006) applied the Granger Causality Test to study whether there is a cause-and-effect relationship between absolute value of the Shanghai stock index and economic variables based on yearly data running from 1992 to 2004. They found that only the GDP and money supply have an effect on stock returns. These economic variables were the causes of fluctuated stock prices.

2. Research Framework and Methodology

The research framework includes the theoretical and conceptual frameworks, hypotheses, and operationalization of the variables.

Based on the aforementioned empirical studies and theoretical frameworks developed, explanatory macroeconomic variables of stock returns were extracted. The theoretical framework is key to helping researchers establish and expand the related research field. Relying on the generality of the theoretical framework, researchers usually get some support or evidence from the theoretical framework in order to develop a conceptual framework.

The conceptual framework of this paper thus adopts the macroeconomic variables based on these empirical studies.

The dependent variable is the stock returns of the beverage and food sector on the Chinese stock exchanges. The Factors applied in the conceptual framework, the independent variables, include money supply, inflation rate, foreign exchange reserve (Champi, 1999), crude oil price, industrial production, gold price, export and import rates (Türsoy *et al.*, 2008), and the consumer confidence index (Wang and Tian, 2009). Nine hypotheses were formulated on the following pattern (See Appendix One): *The independent variable has no effect on the monthly stock returns of the beverage and food firms listed on the Shenzhen Stock Exchange Market and conversely the independent variable has an effect on the monthly stock returns of the beverage and food firms listed on the Shenzhen Stock Exchange Market.*

The researcher expects the performance of the stock return to reflect the state of the

domestic economy and show a significant relationship between the macroeconomic variables and stock market returns. Zikmund (2003) argued that descriptive research can explain the features and characteristics of a population, and determine the answers to whom, what, when, and how questions. Thus, descriptive research is followed and applied in this study.

As of 31 May 2010, there are a total of 40 beverage and food firms listed on the SSE. Based on what was suggested by Zikmund (2003), the target population is the entire group of particular population components relevant to the study. Therefore, the target population in this research is the 24 beverage and food firms listed on the SSE during the 2005-2009 period.

As to the sampling process in this study, the researcher applied the judgment sampling technique. Data was collected from market reports (www.sina.com) on the 24 listed firms for the 60 months considered. Thus, 24 sampling stocks were omitted.

The data collected has been treated statistically since, generally speaking, it is an important tool for using and classifying data in the right form. In other words, the statistical treatment of the data describes the data, which could help the researcher understand the characteristics of the data, and interpret how the data become focused (Zikmund, 2003). Therefore, the Ordinal Least Square Regression, Multiple regression analysis, Stationarity and Unit Root Testing, Heteroskedasticity Test, Serial Correlation Test, Multi-collinerity Test, Goodness of Fit, and T-test were used.

Secondary data was also used by the researcher. Due to the two important policies issued by the Chinese government, the 2005 stock right decentralized allot revolution and RMB exchange rate reform, all the data was collected from the reports listed on the official websites of the Central Bank of China (<http://www.pbc.gov.cn/>), SSE (<http://www.szse.cn/>), Sina Finance (www.finance.sina.com.cn) and Renda Economics Forum (www.pinggu.org) for the 2005-2009 period.

In order to meet the objective of this

research, the Excel and Eviews 5 program were applied in this study. Besides, the researcher adopted descriptive statistics to illustrate the central tendency and dispersion of a set data by mean value, minimum and maximum value, and standard deviation. A descriptive analysis analysed, collected and summarized a set of statistic data to conclude the characteristics of all the same sets of data.

Ordinal Least Square Regression, the regression estimation technology designed to explain the relationship between the dependent and independent variables was applied. The basic principle of OLS is to minimize the sum of squared residual to be quite appropriate from a theoretical point of view (Zhang, 2009). And the SPSS program was used by the researcher in order to find out the value of each variable.

The multiple regression analysis, which is a simple way of stating the relationship between independent and dependent variables, enabled the researcher to incorporate the variables into a multiple regression model as follows as suggested by CRR (1986):

$$R_i = b_0 + b_1 F_{i1} + b_2 F_{i2} + \dots + b_k F_{ik} + E_i$$

Where, R_i is the realized return and b_i the reaction coefficient measuring the change in portfolio returns for a change in risk factor and F_i the macroeconomic factors, obtained and extracted based on the principle components analysis, E_i is a residual error for portfolio and b_0 is constant.

Since the multiple regression model was applied in this study, the researcher estimated a regression model for INDEX based on the monthly data over the 2005-2009 period. To find out the relationship between INDEX and the nine macroeconomic variables, which include money supply (LM2), inflation rate (LCPI), foreign exchange reserve (LFOXRE), industrial production index (LIP), crude oil price (LOILPR), gold price (LGOLDPR), import rate (LIMPORT), export rate (LEXPORT) and consumer confidence index (LCCI), the regression model was determined to be as follows:

$$R_i = \beta_0 + \beta_1 LM2 + \beta_2 CPI + \beta_3 LFOXRE + \beta_4 LIP + \beta_5 LOILPR + \beta_6 LGOLDPR + \beta_7 LIMPORT + \beta_8 LEXPORT + \beta_9 LCCI + e$$

Where:

- R_i is the index return of beverage and food industry during period t , $t = 1 \dots 96$,
- β_0 = the constant term for index return of beverage and food-
- industry, $\beta_1 \dots \beta_9$ = Beta coefficients
- e = Residual error
- $LM2 = \ln(\Delta M2)$
- $LCCI = \ln(\Delta CCI)$
- $LFOXRE = \ln(\Delta \text{Foreign exchange reserve})$
- $LIP = \ln(\Delta \text{Industrial production index})$
- $LOILPR = \ln(\Delta \text{Crude oil price})$
- $LGOLDPR = \ln(\Delta \text{Gold price})$
- $LIMPORT = \ln(\Delta \text{Import Rate})$
- $LEXPORT = \ln(\Delta \text{Export Rate})$
- $LCCI = \ln(\Delta \text{Consumer confidence index})$

The stationarity of a series can strongly influence its behaviour and properties. The time series must be stationary; otherwise, the problem may be a false return. Therefore, before conducting a regression analysis, the first step is to respond to each macroeconomic variable for the balance of time series of unit root test.

A unit root means that the observed time series is not stationary. When non-stationary time series are used in a regression model, one may obtain apparently significant relationships from unrelated variables. This phenomenon is called spurious regression.

One of the most widespread unit root test is the Augmented Dickey Fuller (ADF) test introduced by Dickey and Fuller in 1979. This test is applied in this paper.

The researcher applied three values to determine the model fitting for macroeconomic variables and stock returns, namely, R , R Square, and adjusted R square. This is an attempt to find the suit line of best fit in order to interpret and assess whether this line fits the actual data.

3. Empirical Test Results

- Correlation among Explanatory Variables

The matrix of correlation analysis between each individual variable is the easiest way to measure the extent of the multicollinearity problem. If the value of correlation coefficient is greater than 0.79 or less than

-0.79, it can be interpreted as indicating that the variables may have a multicollinearity problem. The solution to the multicollinearity problem is to drop one of the collinear variables.

According to the correlation table (Table 2 below), the macroeconomic variables indicate that the correlation is quite low among the variables due to their transformation.

Table 2 - Correlation Matrix of the Macroeconomic Variables

	INDEX	LIP	LIMPORT	LEXPORT	LM2	LCPI	LFOXRE	LOILPR	LGOLDPR	LOCI
INDEX	1	0.013612	0.077391	0.008112	0.127207	-0.04251	0.042044	0.127455	0.260027	0.133362
LIP	0.013612	1	0.29463	0.116173	0.111534	-0.26543	-0.08912	0.150702	0.156845	0.070208
LIMPORT	0.077391	0.29463	1	0.727393	0.252792	0.15934	0.047833	0.091076	-0.00686	0.157796
LEXPORT	0.008112	0.116173	0.727393	1	0.249496	0.162131	0.153443	0.111198	-0.10546	0.126238
LM2	0.127207	0.111534	0.252792	0.249496	1	-0.17013	0.00624	0.159956	0.046605	0.034799
LCPI	-0.04251	-0.26543	0.15934	0.162131	-0.17013	1	0.214248	-0.02091	-0.07096	-0.02068
LFOXRE	0.042044	-0.08912	0.047833	0.153443	0.00624	0.214248	1	0.152123	-0.05517	-0.04038
LOILPR	0.127455	0.150702	0.091076	0.111198	0.159956	-0.02091	0.152123	1	0.191381	0.367516
LGOLDPR	0.260027	0.156845	-0.00686	-0.10546	0.046605	-0.07096	-0.05517	0.191381	1	0.269604
LOCI	0.133362	0.070208	0.157796	0.126238	0.034799	-0.02068	-0.04038	0.367516	0.269604	1

Note: Eviews Outcomes

- Regression Results

Researchers always check the problem of serial correlation by using two methods; the Durbin-Watson test and Breusch-Godfrey Serial Correlation LM Test. The Durbin-Watson test just focuses on testing the serial correlation problem in the first order. However, the LM test can check other lags serial correlations. Both were applied in this research.

As shown in Table 3 (See Appendix Two), the value of Durbin-Watson test is 1.939080, which is very close 2. Therefore, it can be concluded that there is no serial correlation (first order) problem.

As to the other lag serial correlations using LM test, the P value of both F-statistic and Obs*R-squared are greater than Sig.0.05, which means that there is no other related

problem. Thus, based on the results of the two tests, it could be concluded that there is no serial correlation in the test results.

The researcher expected a positive relationship between money supply (M2) and stock prices since an increase of the money supply would increase the discount rate. There is a positive relationship between the two variables. M2, however, is found insignificant at 95% level of confidence since P value is 0.293. Therefore, it can be concluded that money supply has no effect on the monthly stock returns of the beverage and food firms listed on the SSE.

Generally, the inflation rate is positively related to the nominal risk-free rate and a cause for the increase of the discount rate in the valuation mode. A negative relationship between inflation rate and stock p can thus be expected. The findings show the Beta to be -71.911, which implies there is a positive relationship between the two variables. Also, the P value is greater than Sig.0.05, which also means CPI is found to be insignificant at 95% level as P value is 0.5995. Therefore, the inflation rate has a no effect on the monthly stock returns of the beverage and food sector on the SSE.

A large foreign exchange reserve increases the money supply and causes interest rates to drop. It is also a cue for an upturn in stock prices. The regression results show a positive relationship between foreign exchange reserve and stock prices. The P value 0.0645, which is less than Sig. 0.1, meaning that the foreign exchange reserve is a statistically significant factor at a significance 10% level, but insignificant at a significance 5% level. Furthermore, this 0.0645 figure shows that the foreign exchange reserve will increase as stock prices increase.

Usually oil prices go up when the inflation rate increases. A higher inflation rate will cause the discount rate in the valuation model to increase. Thus, there is a negative relationship between crude oil price and stock returns. However, the results show a Beta value of -14.391, which implies that there is a negative relationship between the two variables. Also, oil price is found to be insignificant at a 95% level of confidence

since P value is 0.3939, which means there is no relationship between crude oil price and stock returns.

The industrial production index, which is related to real economic activity, is expected to affect stock prices in the same direction it moves; an increase of the industrial production index will result in higher stock returns. The results show that the industrial production index has a positive relationship with stock prices. It is also found to be insignificant at 95% level of confidence because the P value is 0.3793. There is therefore no positive relationship between industrial production index and stock prices.

Gold price as related to economic activities is expected to affect stock prices in an opposite direction: a rise in the price of gold will see lower stock returns. Results in this study show the Beta value to be 65.0257, which means that there is a positive relationship between gold price and stock prices. Gold price is significant at a 95% level of confidence since the P value is 0.0333. Thus a positive relationship exists between gold price and stock prices. An increase of gold price causes stock prices to be higher too.

As to export trade, the value of bate (-18.446) can be interpreted as showing the existence of a negative relationship between export rate and stock returns. The P value is 0.2661, which is greater than Sig.0.05 level. It can be concluded that the export rate has no effect on the monthly stock returns of the beverage and food sector at SSE.

The import rate generally simulates market performance. In this study, the value of beta (8.60052) shows a positive relationship between them. Also, since the P value is 0.596, which is more than 0.05, it can said that the import rate is a statistically insignificant variable at a level of significance of 0.05.

Positive consumer confidence boosts investors' confidence. In this study, at 377.179, the value of bate for the consumer confidence index moves in the same direction as the stock market performance. It shows a positive relationship between these two variables. Moreover, the P value falls at 0.0235, which is less than Sig. 0.05 level. The confidence index has thus an effect on the monthly stock returns

of the beverage and food firms listed on the SSE. In other words, consumer confidence will increase as stock returns increase.

Conclusion and Recommendations

This research aims to investigate the relationship between the stock returns of the beverage and food sector and nine macroeconomic variables in China. The analyses were conducting using monthly data pertaining to the whole beverage and food industry index between 2005 and 2009. The multiple regression analysis was employed to examine these relationships.

Based on the results of the empirical test, changes between the macroeconomic variables and the stock returns are well suited to explain the realities of the economic situation in China. The regression results show that there are three significant variables out of a total of nine explanatory variables: foreign exchange reserves (LFOXRE) at Sig.0.1 level ($0.0640 < 0.1$), gold price (LGOLDPR), and consumer confidence index (LCCI) at Sig. 0.05 level ($0.0333 < 0.05$, $0.0235 < 0.05$). These three macroeconomic variables are shown to have a positive and significant statistical relationship with the stock returns of the beverage and food companies listed on the SSE.

A number of suggestions and recommendations can be made. First of all, the international reserve, which is referred to as reserve assets in the balance of payments and includes monetary gold and foreign exchanges has a statistically significant relationship with stock returns. China now has the biggest foreign exchange reserve in the world. But often, very large reserves are not a hedge against inflation, but rather a direct consequence of the opposite policy, meaning that the Central Bank in Beijing, has purchased a large amount of foreign currency in order to keep the value of Chinese RMB relatively low. Therefore, the researcher would like to suggest that China Central Bank find ways to convert its large foreign exchange reserves into precious metals, such as gold, silver and platinum. The researcher, in the meantime, would like to further recommend China Central Bank to even consider selecting

a world-renowned industrial property right or intellectual property right as a new alternative for international reserves so as to reduce the risk of foreign exchange reserves.

Moreover, it would be unwise for China Central Bank to be concerned only with gold. Buying gold in large quantities within a given amount of time will undoubtedly introduce an increase in gold demand, which will inevitably cause the rise of gold price.

Secondly, China Central Bank has been actively supporting the expansion of domestic demand, but the level of internal consumption represents a small percentage of China's GDP, which has undoubtedly affected the function of the CCI. Therefore, the CCI knowledge must be widely advocated. And China Central Bank is to continue to implement a proactive fiscal policy and prudent monetary one, and ensure a double-pull effect on economic growth from both consumption demand and investment demand.

Thirdly, from a macroscopical policy view point, the Chinese government has to set some standards for an information disclosure system first in order to avoid the disclosure of information regardless whether it is during an economic crisis or in a period of stability and economic growth. For instance, unified disclosure information by an electronic information disclosure system will prevent information from being distorted or delivered dilatorily.

The Chinese government should also establish a healthy stock market based on three key principles which could therefore help to manage the stock market in a fairer and more transparent way since the stock market can not be seen only as a field of profit making for certain privileged minorities. On the contrary, it should be seen as a field for investors to venture equally.

Investing in overseas stock markets as an indirect form of investment can carry high risks when a financial crisis occurs. Therefore, to encourage Chinese corporations to take initiatives altering their investment model, investing abroad directly and handling overseas market by merging or controlling stocks could be significant steps. Moreover, it is necessary to renew the financial system

in order to enhance the multicurrency collaboration and avoid currency fluctuation at the time of financial crisis. The Chinese government, in the meantime, can develop a relatively aggressive policy to attract foreign direct investment in U.S. dollar in order to prevent it from creating an impact on the Chinese stock market.

Fourthly, besides readjusting macroscopic policies, firms in the beverage and food sector have to begin to devise new tactics to boost their market shares. Roughly speaking, the Chinese beverage and food industry is classified into two categories based on the industrial chain: Processing type and Sales type. Regarding the processing type, managers must face brand operators in a direct way. However, sales activities involve just selling commodities directly to consumers. Both types may therefore engender new strategies during economic crisis.

The strategy for Sales Type enterprises should be to determine the optimum time for entering the international market as many enterprises went bankrupt during the recent global economic crisis, especially small and medium-sized ones. Applying this strategy will help Chinese firms buy out foreign brands, acquire new technology and expand their market share.

On the other hand, the strategy for Processing Type enterprises should be to place a strong emphasis on controlling downstream business. China has long owned the title of the "world-processing factory", which means that the processing type enterprises in China possess seasoned operation management with reasonable production technology, processing equipment and production management. Because of their having difficult access to end users, the managers of processing type enterprises should start contemplating using their existing advantages to create their own product brands.

Last but not least, investors and shareholders should consider other macroeconomic variables to reckon whether they affect the performance of the beverage and food firms listed on the Chinese stock exchange. Meanwhile, the meso-economic variables and micro-economic variables are to

be studied to see whether they have an impact on stock prices. Due to the high PE ratio, which is higher than 25% (Lawrence J, 2008), the investment value of the beverage and food industry's stocks is not outstanding. However, stocks with a low PE ratio should be deemed as the first choice if investors want to invest in this sector.

This research could also serve as a guide for academicians and practitioners interested in doing studies on the Chinese stock market. Nevertheless, for further studies, it is suggested to include other macroeconomic factors, such as GDP and unemployment rate, into consideration. In the aspect of meso-economic factors and micro-economic variables, like sales, profitability and dividend of the firms are to be weighed as well.

Since the stock market fluctuates swiftly, it is suggested that for future studies, quantitative analyses are to be made based on daily or weekly data collected over a longer period of time, which may produce more reliable results.

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Appendix One: Hypotheses

Ho1: Money supply has no effect on the monthly stock returns of the beverage and food firms listed on the Shenzhen Stock Exchange Market.

Ha1: Money supply has an effect on the monthly stock returns of the beverage and food firms listed on the Shenzhen Stock Exchange Market.

Ho2: Inflation rate has no effect on the monthly stock returns of the beverage and food firms listed on the Shenzhen Stock Exchange Market.

Ha2: Inflation rate has an effect on the monthly stock returns of the beverage and food firms listed on the Shenzhen Stock Exchange Market.

Ho3: Foreign exchange reserve has no effect on the monthly stock returns of the beverage

- and food firms listed on the Shenzhen Stock Exchange Market.
- Ha3: Foreign exchange reserve has an effect on the monthly stock returns on the beverage and food firms listed on the Shenzhen Stock Exchange Market.
- Ho4: Crude oil price has no effect on the monthly stock returns of the beverage and food firms listed on the Shenzhen Stock Exchange Market.
- Ha4: Crude oil price has an effect on the monthly stock returns of the beverage and food firms listed on the Shenzhen Stock Exchange Market.
- Ho5: Industrial production index has no effect on the monthly stock returns of the beverage and food firms listed on the Shenzhen Stock Exchange Market.
- Ha5: Industrial production index has an effect on the monthly stock returns of the beverage and food firms listed on the Shenzhen Stock Exchange Market.
- Ho6: Gold price has no effect on the monthly stock returns on the beverage and food firms listed on the Shenzhen Stock Exchange Market.
- Ha6: Gold price has an effect on the monthly stock returns of the beverage and food firms listed on the Shenzhen Stock Exchange Market.
- Ho7: Export rate has no effect on the monthly stock returns of the beverage and food firms listed on the Shenzhen Stock Exchange Market.
- Ha7: Export rate has an effect on the monthly stock returns of the beverage and food firms listed on the Shenzhen Stock Exchange Market.
- Ho8: Import rate has no effect on the monthly stock returns of the beverage and food firms listed on the Shenzhen Stock Exchange Market.
- Ha8: Import rate has an effect on the monthly stock returns of the beverage and food firms listed on the Shenzhen Stock Exchange Market.
- Ho9: Consumer confidence index has no effect on the monthly stock returns of the beverage and food firms listed on the Shenzhen Stock Exchange Market.
- Ha9: Consumer confidence index has an effect on the monthly stock returns of the beverage and food firms listed on the Shenzhen Stock Exchange Market.

Appendix Two

Table 3: LM Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.549878	Probability	0.867208
Obs*R-squared	8.877242	Probability	0.713378

Note: Eviews Outcomes