Factors Affecting Financial Performance of Agricultural Firms Listed on Shanghai Stock Exchange

Wei Wei

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FACTORS AFFECTING FINANCIAL PERFORMANCE OF AGRICULTURAL FIRMS LISTED ON SHANGHAI STOCK EXCHANGE

MS. WEI WEI

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The research aims to examine the effect of liquidity, asset utilization, leverage, economic prosperity and agricultural products price index on financial performance of agricultural firms listed on Shanghai Stock Exchange (SSE) from 2006 until 2010. Due to the non-stationary series data and multicollinearity problem that may result in a spurious regressions, the Unit-Root test was used to check the stationary qualification and Multicollinearity test was used to check the multicollinearity problem before the regression results. The research found that the factors that effect on financial performance of agricultural firms listed on SSE are asset utilization, leverage and agricultural products price index.
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CHAPETR 1

INTRODUCTION

The purpose of this chapter is to present the study of the importance of the factors affecting the agricultural firms listed on Shanghai Stock Exchange. The following are topics in this chapter:

1.1 Background

1.2 Statement of Problems

1.3 Research Objectives

1.4 Research Questions

1.5 Scope of the Study

1.6 Expected Benefits

1.7 Operational Definition

1.8 Organization of the Study
1.1 Background

As the stock market of China has been developing 20 years, the listed firm has become the leading role in the market economy stage. During these years, the number of the listed firm has soared to more than one thousand from several at first. Investor’s description and appraisal of asset management and utilization quality, debt risk and credit capacity, profit ability and profit quality, and capital expanding and corporate growth potential are directly reflected by the fluctuation of the return on assets and the return on sales. Financial performance of listed firms becomes the issue of common concern of the stakeholders including the shareholder, the creditor, the company staffs and the government administration and so on. At present, as the capital market expands and speeds, a great number of firms crowd into it. Although most listed firms are excellent representative of their businesses, the working rule of market economy, which is the competition mechanism of the superior winning and the inferior washing, leads to the different financial performance, and some of the differences are even big. Firm’s financial performance can reflect their development condition. Therefore, carrying on the influencing factors of their financial performance has the extremely profound theoretic and practical meaning of grasping the listed company’s development trend, and seeking for the strategy of improving and the promoting their financial performance.

China is also a large agricultural nation, and rural population accounts for 75% of the overall population. To adjusting the structure of agricultural production, to strengthen the countryside infrastructural facilities and increase the rural labor force employment, to increase the farmers’ income, has been one of the party and
government’s work centers. Pushing agricultural firm to form an industry and certain size, to grow strongly and greatly, and more leading ones to enter the market after the joint stock transformation, are the important actions of solving the “Three Agriculture” problem. However, Wang (2008) originally described the series of problems of low profit capacity and property quality caused by the business’s own characteristics, weaknesses as well as the management environment, have affected the listed firms’ sustained development to a large degree. Thus, analyzing objectively and appraising the financial performance condition of the agricultural listed firms, which is an important area which relates to Chinese thriving and Chinese people’s surviving, discovering the primary factors that influence the finance performance of agricultural listed firms, proposing constructive policy to support the development of agricultural listed firms, is a vital practical thing.

1.2 Statement of Problems

As a representative in the advanced agricultural production force in China, listed agricultural firms are born and developed as the result of China’s development and merge of market-oriented agriculture and capital market, which also reflects the mutually benefited and promoted relationship between agriculture and securities market. The birth and development of the listed agriculture firms is quite important to the agricultural restructuring, industrialized management of agriculture, improving agricultural products quality and agricultural management, upgrading international competitiveness of agriculture and quickening the agricultural modernization in China.
Wu et al. (2010), good financial performance is the precondition of agricultural listed firms to be sustained and healthy development. Rising profitability is the driving force of agricultural listed firms to drive agriculture from traditional agriculture to modern agriculture. Therefore, the study on factors affecting financial performance of agricultural listed firms helps firms to improve its financial performance and to maintain sustainably growth.

However, in recent years, Peng (2006) mentioned that a series of problems related to the transitional economic background and historical factors have led to the poorer financial performance, higher risks of the listed agricultural firms, which have consequently affected the competitiveness and sustained development of the firms. The financial performance of the listed agricultural firms can reflect their development. Therefore, the deep analysis of the factors affecting their financial performance in the background of transitional economy in China is theoretically and practically vital to understand the development trend of the listed agricultural firms and improving their financial performance.

According to Gao (2010), agriculture is foundation of national economy. China is a large agricultural country as well as a developing agriculture country. Agricultural listed firms financed from capital market and promote agriculture integration operation, which is a trend in the future of agriculture development. However, agricultural listed firms have faced big challenge in China that financial performance is getting worse and diversification operations are in failure from news and papers.
As stated in Hao (2011), China has a large population, but has a relatively small field land. As of 2010, China has field land area only about 300.796 million acres. The per capita field land area is 0.227 acre, which only 40% of the world average. Thus it can be seen the important to improve the productivity of the agricultural sector. The agricultural economy is the foundation of the national economy, and agricultural listed firms are also an important component of China’ stock market. Therefore, it’s very necessary to study the factors affecting on financial performance of agricultural listed firms.

Qin et al. (2011) showed that agricultural listed firms are essential on the sustainable development of agriculture. The small population quantity, slow development, weak growing capacity, relatively poor rationality and unbalanced regional distribution situation of China’s agricultural listed firms have seriously restricted the development of China’s agricultural economy.

The financial performance of agricultural firms changes over time. Profits are different from one year to another and from one firm to another. Some firms obtain increases in profit; others record decreases and some even losses. What are the reasons of these changes and which are the factors of financial performance that influences it to be different in time and space? This paper will try to answer these questions.

1.3 Research Objectives

The research objectives are shown as follows:
1. To examine the effects of liquidity on financial performance of agricultural firms listed on Shanghai Stock Exchange.

2. To examine the effects of asset utilization on financial performance of agricultural firms listed on Shanghai Stock Exchange.

3. To examine the effects of leverage on financial performance of agricultural firms listed on Shanghai Stock Exchange.

4. To examine the effects of economic prosperity on financial performance of agricultural firms listed on Shanghai Stock Exchange.

5. To examine the effects of agricultural products price index on financial performance of agricultural firms listed on Shanghai Stock Exchange.

1.4 Research Questions

This study will attempt to answer the following research questions:

1. How does liquidity affect financial performance of agricultural firms listed on Shanghai Stock Exchange?

2. How does asset utilization affect financial performance of agricultural firms listed on Shanghai Stock Exchange?

3. How does leverage affect financial performance of agricultural firms listed on Shanghai Stock Exchange?

4. How does economic prosperity affect financial performance of agricultural firms listed on Shanghai Stock Exchange?
5. How does agricultural products price index affect financial performance of agricultural firms listed on Shanghai Stock Exchange?

1.5 Scope of the Study

This study intends to investigate factors that affect financial performance of firms that focused only on the agricultural firms listed on Shanghai Stock Exchange. Dependent variables of the study are return on assets, return on sales and sales growth, and independent variables are liquidity, asset utilization, leverage, economic prosperity and agricultural products price index. This study uses quarterly Financial Statement data starting from January 2006 to December 2010.

1.6 Expected Benefits

These expected benefits of this study are shown as follows.

1. To examine factors that affect return on assets, return on sales and sales growth, and increase ability to improve the financial performance of agricultural firms listed on Shanghai Stock Exchange.

2. This study can also be used as resource information for future studies on factors affecting firm’s financial performance.
1.7 Operational Definition

**Financial performance** refers to the performance of how well a firm is using its resources to make a profit, which is measured by return on assets, return on sales and sales growth.

*Return on assets* (ROA) reveals the ability of the firm to create profit in excess of actual uses from assets. The higher ROA; the more efficiently use its assets. The ROA is calculated by:

\[
\text{ROA} = \frac{\text{Net Income}}{\text{Total Assets}}
\]

*Return on sales* (ROS), which is also known as net profit margin. It reveals the efficiency of firm’s operation. It provides insight into how much profit is being earned per unit of payment. It is better to compare this ratio with other firm in the industry to know how well the firm can do. The higher ROS; the more profitability the firm gets. The ROS is calculated by:

\[
\text{ROS} = \frac{\text{Net Income}}{\text{Net Sales}}
\]

*Sales growth* (SG) reveals the ability of firm increasing the percentage of sales between two quarters. The higher SG; the good sales be bringing by firm. The SG is calculated by:

\[
SG = \left( \frac{\text{Sales}_t - \text{Sales}_{t-1}}{\text{Sales}_{t-1}} \right) \times 100\%
\]

**Liquidity** is proxied by current ratio; calculate as current assets over current liabilities.

*Current ratio* reveals how capable a firm is in paying its current liabilities by using current assets only. The higher current ratio, the more liquid the firm has. The current ratio is calculated by:
Current Ratio = \frac{Current\ Assets}{Current\ Liabilities}

**Asset utilization** is proxied by total asset turnover ratio; calculate as sales over total assets.

*Total asset turnover ratio* reveals how effectively the firm uses its assets to generate sales or revenues. The higher total asset turnover ratio, the more productively the firm uses its assets. The total asset turnover ratio is calculated by:

\[ \text{Total Asset Turnover Ratio} = \frac{Sales}{Total\ Assets} \]

**Leverage** is proxied by debt ratio; calculate as total debt over total assets. This ratio represents the potential risks the firm faces in terms of its debt-load.

*Debt ratio* reveals the relation between the total debt, total equity and liabilities of firm. The higher debt ratio, the higher level of liabilities that firm has. The debt ratio is calculated by:

\[ \text{Debt Ratio} = \frac{Total\ Liabilities}{Total\ Equity\ and\ Liabilities} \]

**Economic prosperity** is proxied by gross domestic product (GDP). Chinese GDP is the end results of the production activities of all the resident units (including foreign firms) within China borders in a given period.

**Agricultural products price index** is proxied by the producer price index of agricultural products in China. The producer price index of agricultural products is the relative number of the change tendency and magnitude of the agricultural products selling price in a certain period.

**1.8 Organization of the Study**

The study consists in five chapters as follows:
Chapter 1 Introduction

In the introduction, this chapter describes the background, statement of problems, research objectives, research questions, scope of study, expected benefits, operations definition and organization of the study.

Chapter 2 Literature Review

This chapter presents the relevant theories to understand the related conception, related research and conceptual framework to this study.

Chapter 3 Methodology

This chapter includes research design, population and sample size, variable of the research, data collection, data analysis and hypothesis.

Chapter 4 Data Analysis and Results

This chapter includes Unit – Root test, descriptive statistics, multicollinearity test and regression results.

Chapter 5 Conclusion, Discussions and Recommendations

This chapter includes conclusion, discussion, implication of the study, research recommendation and limitations and further research.
CHAPTER 2

LITERATURE REVIEW

This chapter represents review of the concept from the prior researches and relevant literatures. The followings are topics in this chapter;

2.1 Financial Performance Evaluation

2.2 Firm Financial Performance

2.3 Determinants of Firms Performance

2.4 Conceptual Framework
2.1 Financial Performance Evaluation

The financial performance evaluation is to carry out an evaluation and analysis of the financial status of a company so as to reflect its financial situation and developing trend on the basis of the financial indexes reflected in its financial statements. It provides important financial information for the company to improve its financial performance and decision-making process (Zhang, 2007).

Evaluation refers to the management of the object by using the corresponding scientific method comparing results received with goal booked originally and therefore obtains course of the best result (Kim and Takahiro, 1991). Financial performance evaluation is a method of analysis and evaluation through the relevant data of organization financial statements and other materials collecting calculating comparing and explaining, and further reveals the financial position, profitability, operating conditions (Suwignjo, Bititci and Carrie, 2000).

To evaluate a firm’s financial performance and condition, the financial analyst needs to perform “checkups” on various aspects of a firm’s financial health. A tool frequently used during these checkups is a financial ratio (James and John, 2005).

There are many papers used financial ratios to evaluate firm performance.

Beaver (1966) selected 79 companies from the crisis companies between 1954 and 1964. Beaver found that the best variable to explain company financial performance is Cash Flow/Total Liabilities Ratio, followed by Total Liabilities/Total Assets Ratio, Net

Altman (1968) proposed the famous Z-Score model. He used 33 companies declared bankruptcy in 1946-1965 as the research sample; and then selects 33 normal companies to pair in accordance with the industry and size of the sample. Altman chosen the 22 kinds of financial ratios; select five financial ratios have the most explanatory capacity by stepwise multiple discriminate analysis method: Working Capital/Total Assets, Retained Earnings/Total Assets, EBIT/Total Assets, Rights and Interests of Market Value/Total Liabilities, Sales/Total Assets.

Altman (1977) modified the Z-Score model, proposed Zeta model. Empirical results show that there are seven significant variables to test company performance: Pretax Net Profit/Total Assets, 10-year Standard Error of Pretax Net Profit/Total Assets, Pretax Net Profit/Interest Payments, Current Assets/Current Liabilities, Retained Earnings/Total Assets, 5-year ordinary shares’ Average Total Market Value/Total Capital and 5-year common stock Average Total Market Value/Total Size.

Ou (1990) studied that the nonprofit figures in the annual financial contain the information of the next year earnings change direction. The dependent variable of his design prediction model is the probability of next year’s report earnings will higher or lower than the expected earnings (predicting based on time series model). About predicting variables, he established a candidate set of variables consisting of 61 independent variables at first; and then selected 8 independent variables: the stock divided by total assets ratio, total asset turnover ratio, the changes in the dividend per
share (compared with the previous year), the growth rate of depreciation expense, capital expenditures divided by total assets ratio, the prior year capital expenditures divided by total assets ratio, ROE, the changes rate of ROE (compared with the previous year).

Kloptchenko (1998) tested financial performance according to previous researches selected 7 financial ratios: Operating Margin, Return on Total Assets, Return on Equity, Current Ratio, Shareholders’ Equity Ratio, Interest Coverage Ratio, and Accounts Receivable Turnover Ratio.

Chen (2000) discussed the prediction problem of ST companies in China’s stock market through financial ratios derived from the annual report of listed companies. He selected 6 financial ratios as explanatory variables: Current Ratio, Assets Liabilities Ratio, Total Assets Turnover Rate, and Return on Total Assets, Return on Equity and Return on Sales. As the cash flow information is impossible to completely obtain (Chinese companies began cash flow statement in 1998), Chen Yu selected the financial ratios are not involved in the cash flow ratios.

Wu and Lu (2001) studied how to establish models for examine financial performance in China’s listed companies. They firstly selected 21 financial ratios, and then use regression method to select 6 significantly financial ratios: Earnings Growth Index, Return on Assets, Current Ratio, Long-Term Liabilities/Shareholders’ Equity Ratio, Working Capital/Total Assets Ratio and Asset Turnover.

Lam (2004) tested financial performance and selected 16 financial statements variables according to previous studies: Current Assets/Current Liabilities, Sales
Income/Total Assets, Net Profit/Sales Revenue, Total Liabilities/Total Assets, Total Sources of Funds/Total Use of Funds, R&D Expenses, Pre-tax Profit/Sales Revenue, Current Assets/Common Equity, Outstanding Shares, Capital Expenditure, Earnings per Share, Dividend per Share, Depreciation Expense, Deferred Tax and Investment Loan, Common Stock Market Price, Relative Stock Price Index.

Zhang et al. (2006) chose the 15 financial ratios to examine the factors of financial performance; there are net assets per share, dividend payout ratio, dividend per share, ROA, retained earnings ratio, current ratio, quick ratio, debt ratio, long-term debt ratio, receivable payment ratio, inventory turnover ratio, ROS, net profit margin, return on investment and ROE.

Liu (2010) chosen 23 financial ratios to determine the financial performance evaluation system, and used regression analysis and factor analysis to analyze the data of 2008 China’s top 10 steel industry firms listed on Shanghai and Shenzhen stock exchange. The results showed that the nine financial ratios are more relevant relationship with financial performance mainly: asset-liability ratio, current ratio, total asset turnover, current ratio, quick ratio, total assets profit margin, the main business profit margin, the growth rate of main business income and net profit growth.

2.2 Firm Financial Performance

Domestic and foreign scholars already have a unified view on the definition of the firm financial performance. In general, Shi Qi (2009) defined the firm financial performance as the firm operating results within a certain period; it can be
comprehensive reflection by the situation of profitability, asset quality, financial risk and business growth conditions etc. Zhang (2010) defined the firm performance as the results or outcomes of firm during a certain operating period; and defined financial performance as the performance measured by using financial ratios. Firm financial performance evaluation refers to the suitable and scientific evaluation for firm operating effectiveness and operators’ performance by using financial ratios. Its definition is related to the selection of financial ratios, ratios system establishment and the use of what kind of evaluation method etc. Maryanee and Don (2006) defined return on assets (ROA) as a measure how efficiently assets are used by calculating the return on total assets uses to generate profit. James and John (2005) defined return on sales (ROS) as the sum of net sales minus cost of goods sole divided by net sales. ROS shows that the profit of the firm relative to sales, after deduct the cost of producing the goods. ROS is a measure of the efficiency of the firm’s operations, as well as an indication of how products are priced.

However, scholars have different view on the selection of firm financial performance ratios. The early scholars focused on return on shareholders’ mainly based on the capital market transactions data, such as the empirical test of Moskowitz (1975) and Vance (1975) were based on market income ratios to measure the firm’s financial performance. But Bowmen (1978) proposed should be based on financial statements data, and selects the accounting ratios to reflect the operating results of the entire firm; the accounting ratios include the return on assets (ROA), return on equity (ROE) and earnings per share (EPS) etc. In the 1980s, there are many scholars evaluated the whole firm financial performance by using market ratios and accounting ratios. McGuire
et al. (1988) selected the market return ratios and the accounting ratios to measure the firm’s financial performance; the market return ratios include the total market return and risk-adjusted market return etc.; the accounting ratios include return on assets (ROA), total assets, sales growth, asset growth and operating profit growth etc. In a word, accounting ratios capture only historical aspects of firm performance (McGuire, Schneeweis and Hill, 1988). They are subject, moreover, to bias from managerial manipulation and differences in accounting ratios measuring procedures (Branch, 1983; Brilloff, 1972). There are many financial ratio related researches focused on the ability of financial statement related ratios to study the financial performance (Beaver, 1966, 1968; Altman et al., 1977; Ambrose and Seward, 1988; McNamara et al., 1988).

Schmalensee (1985) empirical analyst what’s the reasons of the performance differences of firms in the same industry. Return on assets was measured as the ratio of firm performance to research factors affecting on firm performance (firm’s profitability).

Stigney (1990) stated return on assets was measured by the earnings before interest, tax and extraordinary items, divided by net tangible assets in financial performance analysis.

Ray and Keith (1995) argued for the rate of return on assets was measured as the best decomposition of financial ratios for the purposes of studying financial performance.

According to Waddock and Graves (1997) used return on assets (ROA), return on equity (ROE) and return on sales (ROS) these three accounting ratios to measure
firm financial performance; and chose firm size, risk and industry as control variables on studying the determinant of firm financial performance.

Return on assets (ROA) is a widely used measure of financial performance (Barry et al., 1995) that can be influenced by many aspects of the agricultural firms.

Ruf et al. (2001) chose return on equity (ROE), return on sales (ROS) and growth in sales to measure firm financial performance in the research on the determinants of financial performance by analytic hierarchy process.

Regressions were used on the panel data for the 422 firms for year 1996 to year 2000. The financial performance was measured by return on assets (ROA), return on equity (ROE) and return on sales (ROS) to study the relationship between corporate social responsibility and financial performance (Margarita, 2004).

Hitt et al. (2006), return on assets is the ratio to measure firm performance, to be operationalized as the ratio of operative income to total assets. Claudio (2012) collected data of 48 Italian facility management firms from between 2000 and 2009 to study firm performance by using return on assets (ROA) as the dependent variable to measure firm financial performance.

Gerwin, Hans and Arjen (2007), Firm financial performance information is obtained from Thomson Financials DataStream. They used return on assets (ROA) and earnings per share (EPS) to research financial performance of the S&P 500 in the 1997-2002 periods.
Chen (2008) suggested return on assets is a highly comprehensive and the most representative financial ratio; comprehensively reflects the scale of sales, cost control and capital operation of firm; and reflects the results of firm’s business activities and the goal of maximizing value of the firm to pursue.

Guan, Qiu and Zhang (2009) analyzed the external factors affecting business performance by selecting the return on assets as an indicator to measure firm performance; and pointed out return on assets (ROA) can better reflect the financial position and profitability.

Peters and Mullen (2009) studied the determinant of financial performance of 81 firms in the U.S. Fortune 500 firms by using return on assets to measure firm financial performance.

Zeng et al. (2009) used regression method to examine the relationships between ten business factors and firm financial performance (return on assets to be measure) of Chinese manufacturing.

Fu (2011) researched on the relationship between corporate social responsibility and financial performance from the general stakeholder perspective and separate stakeholder dimension perspective. He used return on assets to measure long-term firm performance and used Tobin-Q to measure long-term firm performance.

Yang (2011) present return on assets is the ratio of net income and total assets. It reflects the ability of return on capital; and reflects the management total assets level of listed firms and the condition of reasonably used. The higher operational efficiency of the firm’s total assets, the better financial performance firm has.
2.3 Factors Affecting Financial Performance

Many researchers have done the research about factors affecting firm financial performance. Since the establishment of modern firm’s system, the experts and scholars pay more attention on the financial performance and the factors of financial performance. According to previous studies, this study discuss about each independent variable that may affect firm financial performance, including liquidity, asset utilization, leverage, economic prosperity and agricultural products price index.

2.3.1 Liquidity

2.3.1.1 The general concept of liquidity ratios

According to James and John (2005), liquidity ratios are defined as a measure of a firm’s ability to pay back short-term obligations. Much insight can be obtained into the present cash solvency of the firm and the firm’s ability to remain solvent in the event of adversity. Liquidity ratios can be measure by current ratio and quick ratio. Steve et al. (2006) defined current ratio as a measure of an entity’s liquidity. Current ratio equal current assets divide by current liabilities. The higher the current ratio, the greater ability of the firm pays its bills. High current ratios would appear to be good (if you are a creditor of a firm, a high current ratio indicates that you are more likely to be paid); a ratio that is very high may indicate that a company holds too much cash, accounts receivable, or inventory. High levels of accounts receivable may indicate problems collecting cash from customers, and cash held in noninterest-bearing accounts might be
more productively used elsewhere. Maryanne and Don (2006) defined quick ratio as a measure of liquidity that compares only the most liquid assets to current liabilities. Quick ratio equal to quick assets divides by current liabilities. The quick ratio is a stricter test of a firm’s ability to pay its current debts with highly liquid current assets. The quick ratio removes inventories and prepaid assets from the current asset amount used in the calculation of the current ratio.

2.3.1.2 Liquidity and financial performance

Adams and Buckle (2003) was defined as current assets over current liabilities. Their study pointed out that liquidity measures the ability of managers in firms to fulfill their immediate commitments to policyholders and other creditors without having to increase profits on underwriting and investment activities and liquidate financial assets. Liquidity was statistically significant at the 0.01 level in a one tail test. It found that liquidity was positively related to financial performance.

Fazzari et al. (1988) collected the data of 421 U.S. manufacturing firms in the period 1970-1984. The results showed that the level of liquidity has a significant impact on firm performance. Hu et al. (2006) studied the data of China’s listed firms and found that liquidity has a significant positive correlation to firm performance.

Jose et al. (2010) examined the relative efficiency of 11 major Chinese ports by using an innovative adopted version of Data Envelopment Analysis based on financial ratios in which no inputs are utilized. He used liquidity (current ratio and quick
ratio) to analysis the efficiency of each port. A high current ratio and quick ratio indicate that the firm is liquid, and has the ability to meet its current or liquid liabilities in time, while a low current ratio and quick ratio indicate the firm’s liquidity position is not in a good condition.

Seema et al. (2011) measured the factors impact on the performance of central public sector enterprises (PSEs) over a period of time (1994-1995 to 2006-2007). Liquidity has been assessed by current ratio (CR) and acid test ratio (ATR). CR takes into account five items of current assets, i.e. sundry debtors, loans and advances, cash and bank balances, inventories and stock of other current assets. The findings showed the increase in liquidity has brought salutary impact on the financial performance of firms.

Sibel and Engin (2012) analyzed financial performance on selected financial ratios and its effect on macroeconomic variables for real estate investment trust firms which are indexed on Istanbul stock exchange (ISE). The liquidity ratios have significant relation on financial performance of the real estate investment trusts on ISE.

2.3.2 Asset Utilization

2.3.2.1 The general concept of asset utilization ratios

As the stated in Stephen et al. (2010), asset utilization ratios are intended to describe is how efficiently or intensively a firm uses its assets to generate sales. Asset utilization ratios can be measured by total assets turnover ratio, accounts receivable turnover ratio inventory ratio and fixed asset ratio. Total assets turnover ratio (capital
turnover ratio) is measuring relative efficiency of total assets to generate sales. An increase in the firm’s total asset turnover increases the sales generated for each dollar in assets. This decreases the firm’s need for new assets as sales grow and thereby increases the sustainable growth rate. Increasing total asset turnover is the same thing as decreasing capital intensity. Maryanne and Don (2006) defined accounts receivable turnover ratio as net sales divided by average accounts receivable. The inventory turnover ratio is computed by dividing the cost of goods sold by the average inventory. A low turnover ratio may signal the presence of too much inventory or sluggish sales. With fixed asset turnover ratio, it probably makes more sense to say that for every dollar in fixed assets.

2.3.2.2 Asset utilization and financial performance

Jose et al. (2010) defined total asset turnover as the ratio measure the efficiency of a firm to get incomes or revenues by using its assets. This ratio also indicates pricing strategy. Businesses with low profit margins tend to have a high asset turnover, and those with high profit margins tend to have a low asset turnover.

Wu, Li and Zhu (2010) pointed out total asset turnover ratio can reflect the firm’s asset management. They empirical analysis the impact factors of firm performance of agricultural listed firms by multiple linear regression model. The results shown that return on assets and total asset turnover of agricultural listed firms are significantly positively related. The asset turnover is essential for agricultural listed firms, and directly impact on the ability and speed of firm to increase revenue and expand the
scale. The ability of agricultural listed firms’ asset utilization made a great contribution to the level of firm’s profitability, and had a significant effect on the firm’s financial performance.

Ding and Sha (2011) collected the data of Jilin Forest Industry Co., Ltd to study asset utilization affecting on firm’s financial performance by using principal component analysis and multiple linear regression analysis. The results showed that total asset turnover ratio is positively correlated with financial performance. The faster firm’s total asset turnover, the higher efficiency of asset utilization and the better performance the firm has.

According to Seema et al. (2011), asset utilization was included as total assets turnover ratio (TATR), fixed assets turnover ratio (FATR) and current assets turnover ratio (CATR). The lower turnover is indicative of under-utilization of available resources and presence of idle capacity. Normally, the higher the firm’s total turnover ratio is, the more efficiently are the assets being used. And the results found that the increase in asset utilization ratios is commendable in firm’s financial performance.

2.3.3 Leverage

2.3.3.1 The general concept of leverage ratios

According to Stephen et al. (2010), leverage ratios are intended to address the firm’s long-term ability to meet its obligations. When a firm has debt, it has the obligation to repay the interest. Holding debt will increase the firm’s riskiness. Debt carries with it the threat of default foreclosure and bankruptcy if income does not meet
Leverage ratios can help an individual evaluate a firm's debt-carrying ability. Leverage ratios can measure by debt ratio, debt to equity ratio. As stated in Maryanne and Don (2006), debt ratio was defined as a measure the percentage of assets financed by creditors’ increases, the riskiness of the firm increases. It is computed by dividing a company’s total liabilities by its total assets. As the total liabilities are compared with the total assets, debt ratio is measuring the level of protection afforded creditors in case of insolvency. Creditors often impose restrictions on the percentage of liabilities allowed. If this percentage is exceeded, the firm is in default. The debt to equity is comparing the amount of debt that is financed by stockholders. Debt to equity ratio equal to total liabilities divided by total stockholders’ equity. Creditors would like debt to equity ratio to be relatively low, indicating that stockholders have financed most of the assets of the firm. This ratio is higher, indicating that the firm is more highly leveraged and stockholders can reap the return of the creditors’ financing.

2.3.3.2 Leverage and financial performance

The level of financial leverage shows the ability of listed firm to manage their economic exposure to unexpected losses (Adams and Buckle, 2003). Sun (2011) pointed out that capital structure refers to the composition ratio of each types of capital in the total firm capital. Capital structure of a firm is an important factor affecting financial performance (Ram et al, 1996). Recent advances in theories of finance recognize capital structure of firm to be relevant for determining its financial performance (Ram et al., 2003). Chen (2008) mentioned capital structure refers to the
composition of all firm’s capital and the proportion of each capital. Debt ratio defined as a measure ratio of firm financial leverage (Lu and Beamish, 2004).

There are many experts and scholars have done the related topic to research leverage and firm financial performance, but didn’t get a consistent answer.

(1) Leverage and firm financial performance are positive correlated.

According to Masulis and Ronald W. (1980) studied to show that a positive correlation between common stock price and firm financial leverage, and firm financial performance is positively correlated with debt levels. Comett and Travlos (1989) empirical results shown that financial leverage has a positive correlation with firm value, the reason is that financial leverage and firm value as the endogenous variables will occur in the same direction changes when effecting by the exogenous variables changing. K. Shah (1994) observed the stock price was rising with the increase of the firm’s financial leverage, and vice versa.

Wang and Yang (1998) researched the relationship among financing structure, firm size and profitability of 461 firms listed on Shanghai Stock Exchange; and found that these three ratios have positive relationship. Hong and Shen (2002) investigated the data of 221 firms listed on Shanghai Stock Exchange from 1995 to 1997; and concluded firm’s capital structure and financial performance have a positive correlation.

Wang and Yang (2002) used 845 firms listed on Shanghai and Shenzhen stock exchange as the sample, capital structure (debt ratio) as being the explanatory variable, and profitability (return on assets) as being the explaining variable, analyzed
the relationship between these two variables by regression model based on 1999-2000 data, and found that capital structure and profitability have a positive correlation.

According to Yao and Chen (2008), capital structure and firm financial performance of Chinese media listed firms have a positive correlation by constructing panel data model. Li and Yang (2010) collected the panel data of 38 SME board listed firms, found there was a positive correlation between debt ratio and financial performance.

Zhang (2010) took the firms listed in SME board as research samples to study the factors effecting on firm performance. The results shown debt ratio and firm performance are positively related. Debt financing has leverage can bring a tax-sheltered benefit; improve firm governance and firm performance.

Ding and Sha (2011) selected Jilin Forest Industry Co., Ltd as a research objective, and studied the capital structure influence on firm’s financial performance by using principal component analysis and multiple linear regression analysis. The empirical results show that capital structure is positively correlated with financial performance. Debt can bring a lot of the tax-shield benefits for firm. Increasing the firm’s debt will help improve firm performance.

(2) Leverage and firm financial performance are negative correlated.

According to Titman and Wessels (1988) collected 1972-1982 panel data of 469 U.S. listed firms in the manufacturing sector, found a negative correlation between profitability and debt ratio. Rajan and Zingalas (1995) found that, there was a negative
relationship between profitability and firm performance, and this relationship continues to strengthen with the increasing of the size of the firm.

Hall, Hutchin et al. (2000) studied the impact of long-term debt ratio on profitability and the impact of short-term debt ratio on profitability. The results explored short-term debt ratio has a negative relation with firm financial performance. Booth (2001) compared 10 firms in developing countries as sample, and found that there were negative correlation between capital structure and firm performance of the nine countries (except Zimbabwe). Ram et al. (2003) collected financial statement and capital market data of 566 large Indian firms to study Indian firms’ financial performance. They found that capital structure in the form of the firm’s leverage had a negative relation with financial performance, and the leverage of the firm was important factors affecting financial performance. The negative relation of financial performance with leverage could be expected on the fact that increases in debt leads to an increasing in the firm’s financial and bankruptcy risk.

According to the research of Lu and Xin (1998), there was a negative correlation between financial performance and capital structure (long-term debt ratio) of 35 machinery and transport equipment industry firms listed on Shanghai Stock Exchange by using multiple linear regression models. Feng et al. (2002) explored leverage and long-term debt ratio have a negative correlation with financial performance of 234 issued A shares firms listed on Shanghai and Shenzhen stock exchange before 1995.
Xiao (2005) established simultaneous equations of capital structure and firm performance, and applied least-square method to expand existing researches. The empirical results shown that: Capital structure (debt ratio) and firm performance (return on assets) have apparent interactive relationship; financial leverage is negatively related to firm performance.

Zhang, He and Liang (2007) used the data of 1,116 firms listed on Shanghai and Shenzhen stock exchange from 2000 to 2004 (among them, 829 state-holding firms, and 287 private firms). The results explored that debt ratio has negatively related to the financial performance of all sample firms. The effect of debt ratio on the financial performance of state-holding firms is better than the effect on the private firms.

Chen (2008) empirical analyzed the relationship between capital structure and firm performance of 185 firms listed in SME board of Shenzhen stock exchange by using regression analysis method, explored that, return on assets and debt ratio were negatively correlated. It also meant reducing the debt ratio will improve return on assets of firm.

Mo (2008) calculated the profitability comprehensive score of real estate industry firms by using principal component analysis. Capital structure (debt ratio) has a negatively correlation with financial performance (profitability).

According to Wu, Li and Zhu (2010), Chinese listed firms prefer equity financing, but foreign firms prefer debt financing because of capital structure theory point out the cost of debt financing is lower. They collected data of 42 Chinese agricultural listed firms, and found that return on assets and debt ratio has a significant
negatively related. It explained capital structure of high debt is not suitable for the
development of financial performance of Chinese agricultural listed firms.

In conclusion, it has not yet conclusive about the relationship between
leverage and firm financial performance whether it is positively or negatively correlated,
because of the differences in study samples, firm performance ratios and research
methods.

2.3.4 Economic Prosperity

2.3.4.1 The general concept of economic prosperity

Gross domestic product (GDP) is defined as the sum of the money values of all final
goods and services produced in the domestic economy and sold on organized
markets during a specified period of time, usually a year (William and Alan, 2001).
According to Mankiw (2007), GDP (which we denote as Y) is divided into four
components: consumption (C), investment (I), government purchases (G), and net
exports (NX): Y = C + I + G + NX.

Ma (2011) defined gross domestic product (GDP) as measure of the economy of the
total production and services. GDP reflects a degree of national prosperity. When
there is a higher GDP, the economy is in boom, and the firms will have a higher level of
profitability. The result showed that GDP has a positively related to firm performance. A
large of researches has used GDP as proxy for overall economic prosperity. Real GDP
growth therefore represents changes in overall economic prosperity condition (Bikker &
Hu, 2002; Athanasoglou et al., 2008; Chen, 2010). Economic power (GDP) has shifted to the firm's financial performance (Margarita, 2004).

2.3.4.2 Economic prosperity and financial performance

Ray and Keith (1995) stated the financial performance was determined by an interaction of a number of factors. Return on assets was measured of base firm performance and correlated with gross domestic product (the output factor). It would seem that increases in the level of economic activity, as measured by GDP, are accompanied by increases in ROA. The results found that GDP was positively affected on ROA.

The empirical research of Deng et al. (2009) pointed out that firm performance not only affects by the internal factors, but also affects by the macroeconomic environment. They utilized the data of agricultural listed firms to study GDP, inflation and interest rates etc. have influence on the firm performance. GDP is the most general indicator that reflects the country's overall macroeconomic situation. The fluctuation of GDP reflects the situation of economic cyclical fluctuation. When the higher rate of GDP growth, the economic is boom and the level of profitability is high, and the firm performance is better. On the contrary, when the slowdown in GDP growth rate, the actual level and the expected level of firm earnings will be reduced, and the firm performance is bad. The results showed GDP was positively affecting on firm performance.
Yu et al. (2009) utilized the unbalanced panel data of 1174 firms listed on Shanghai and Shenzhen stock exchange between the years 1994-2006. It analyzed the factors affecting the firm performance in the background of economic reforming; and found that GDP is significant and positively affecting on firm performance.

Chen (2010) observed the effects of the real GDP growth rate and the growth rate of total foreign tourist arrivals on the mutual performance of tourist hotels are then examined via panel regression tests. The results proved that both the real GDP growth rate and the growth rate of total foreign tourist arrivals are significant explanatory factor of occupancy rate; and can strongly explain return on assets (ROA) and return on equity (ROS).

Zhang et al. (2010) investigated the firm performance of state-owned enterprises (SOEs) listed on China’s two exchanges upon share issuing privatization (SIP) in the period 1999-2005, and analyst determinants of firm performance from the angles of macro and micro aspects. The results showed that GDP was positively associated with firm performance.

John and Riyas (2011) suggested that Africa’s performance in sports was dependent on a range of socio-economic factors. The results confirmed GDP was being positively and significantly associated with better performance.

Ma (2011) focused on the macroeconomic factors influencing the firm performance of agricultural listed firms. F-value of GDP was higher than other factors (inflation etc.) to show that GDP had a high ability to explain the firm performance. GDP had a significant relationship with firm performance.
Engin, Ahmet and Metin (2011) analyzed the effects of macroeconomic conditions and financial ratios on debt ratio and return on equity ratio of the tourism firms. They selected six lodging company financial ratios that included tourism sector index on Istanbul Stock Exchange between the years 2002-2010. According to the results, firm performance (ROE) was positively affected by GDP.

Sibel and Engin (2012) estimated the impact of economic conditions and real estate investment trusts’ development on financial performance of such firms in terms of, not only their profitability, but also their overall financial performance as well. Results indicated that firm financial performance has meaningful effect by GDP.

2.3.5 Agricultural Products Price Index

2.3.5.1 The general concept of agricultural products price index

Selcuk (2011) defined consumer price index (CPI) as a measure of average prices for a basket of goods commonly bought by consumers. CPI is used for determining whether general prices are higher, lower or stable over time, calculating annual rate of inflation, and converting nominal values to real. The producer price index (PPI) was defined as a measure of the average prices for a basket of inputs commonly bought by producers. The PPI has two main functions: 1) to provide price index for use in the deflation of gross domestic product (GDP) data; and 2) to provide a general measure of inflation. In the past, PPI was often called “wholesale price index” (WPI). WPI focuses on the prices of traded goods and services between corporations, rather than goods and services bought by consumers. Producer prices of firm products
increasing will leads to prices for intermediate products increasing, producer prices of finished goods increasing and consumer prices increasing. These cause income of firm increasing and the firm performance is good. Consequently, consumer prices can affect producer prices.

Consumer price index (CPI) defined as a weighted average of the prices of a fixed basket of goods and services purchased by a typical urban household (Jacueline and Janna, 1999). The consumer price index (CPI) is when referring to the cost of living, and only telling how prices in one year compare with those in another year. Inflation refers to a sustained increase in the level of general price (William and Alan, 2001). The inflation calculation is taken the consumer price index of one year and subtract the consumer price index for the prior year, then divide the answer by the consumer price index for the earlier year (Jacueline and Janna, 1999).

The agricultural producer prices is the actual unit price be obtained by agricultural producers directly selling their products. The agricultural producer price index is reflecting the relative number between the trending and degree of agricultural producer prices changing in a certain period (zhu, 2000). The agricultural producer price index is a certain period series that measures the changes in prices that agricultural producer receive from the agriculture commodities them producing and selling (Andy, 2001).

Lei (2003) pointed out that the agricultural producer price index is the price index of agricultural products including the four larger categories of planting products, forestry products, livestock products and fisheries products; the fifteen middle categories
of grains, cotton, oilseeds, sugar, vegetables, horticulture, fruits, herbal medicines, forest products, livestock, poultry, eggs, dairy products, marine products and fresh products; and thirty small categories.

2.3.5.2 Agricultural products price index and financial performance

In the study of inflation (consumer price index), Demirguc-Kunt and Maksimovic (1999) divided debt structure into long-term liabilities and short-term liabilities and collected data of 30 countries (including 19 developed countries and 11 developing countries). The results showed that inflation (measured by consumer price index) was negative correlation with long-term liabilities. High inflation causes low debt level and good firm performance.

Booth et al. (2001) empirical researched on 10 developing countries and 7 developed countries and results showed that high inflation rate (measured by consumer price index) will makes the firm debt level decreasing. It meant firm liabilities based on actual economic growth rather than nominal economic growth. Although inflation makes the monetary value of firm assets rising, but the high interest rate and currency risks caused by high inflation will make firm liabilities decreasing. And the firm performance will be better by high inflation.

As stated in Deng et al. (2009), for listed firms, sustained and stable inflation (measured by consumer price index) will cause the firm's actual wealth from the creditors transferred to the shareholders. Inflation or the fluctuation of price affects firm performance on: price fluctuations improve firm's business risks and the possibility of
firm losing tax. In an uncertain environment, when the debt financing is more than a certain limit, the tax associated with the debt will become highly uncertain. Losing more tax will reduce the benefits of shareholder get from debt financing. Shareholders will tend to reduce financial leverage ratio; and it will affects firm performance. The results showed that consumer price index is the factor affecting firm performance.

Wu (2011) proposed the agricultural products price index rising will radiate to the consumer price index through the changes in agricultural products price. Agricultural products, especially food products have a less elasticity of demand. It means that residents increase the food consumption when agricultural products price increasing. Then Engel's coefficient will rise. In general, the Engel's coefficient has a positive relationship with the consumer price index. The agricultural products price increasing will lead to the agricultural prices increasing, and then will bring the inflation pressures. The inflation pressure will stimulate the general price level rising.

According to Ma (2011), consumer price index (CPI) affects the firm financial performance in the following aspects: 1) price fluctuation leads to fluctuations in the product price and cost structure of firm; leads to increase the volatility of the firm’s revenue and improve the firm’s business risk; and leads to firm performance; 2) price fluctuation makes the firms are uncertain the expected cash flows in the investment project. The firms will use a higher discount rate when assessing the project. It will result in fewer project has been adopted and the growth of firm, and can even affect the firm performance. Ma researched how the CPI influences the firm performance of agricultural listed firms; and found CPI can explain the firm performance, but has a weak influence.
2.4 Conceptual Framework

Based on the above literature review and according to the objective of the study, the financial performance has been identified as dependent variable, liquidity, asset utilization, leverage, economic prosperity and agricultural products price index as independent variables. Thus, the conceptual framework is developing to study factors affecting financial performance of agricultural companies listed on Shanghai Stock Exchange as conceptual framework can be shown in figure 2.1.
Figure 2.1: Conceptual Framework

Figure 2.1 The conceptual framework for examining the effects of liquidity, asset utilization, leverage, economic prosperity and agricultural products price index on financial performance.
CHAPTER 3

RESEARCH METHODOLOGY

The purpose of this chapter is to present the methodology of collecting and interpreting data of this study. The following are topics in this chapter;

3.1 Research design

3.2 Population

3.3 Variables of Research

3.4 Data Collection

3.5 Data Analysis

3.6 Hypothesis
3.1 Research design

This study investigates and examines the effects of liquidity, asset utilization, leverage, economic prosperity and agricultural products price index on financial performance of agricultural firms listed on Shanghai Stock Exchange. Therefore, the research is designed to use the quantitative research method and collecting the secondary data by the financial information. The financial information is collected from the quarterly financial reports, which includes balance sheets, income statements of each agricultural firm listed on Shanghai Stock Exchange. This study is important since it allows us to make a preliminary identification of factors that affect the dependent variable of interest. It also allows us to identify variables that should be investigated further.

This research use multiple regression analysis to examine factors that affect the financial performance of agricultural firms listed on Shanghai Stock Exchange.

3.2 Population

This research samples come from the Shanghai Stock Exchange website. There are 20 agricultural firms listed on Shanghai Stock Exchange. The analysis periods in this paper are from 2006 to 2010, so China Hainan Rubber Industry Group Co., Ltd (601118.SH) is excluded because it was listed in 2011. Further analysis of the remaining 19 agricultural listed firms; some firms are marked as special treatment, so this study will remove all those firms, which are Shangdong Jiufa Edible Fungus Co.,
Ltd (600180.SH), Hubei Wuchangyu Co., Ltd (600275.SH), Zhongken Agricultural Resource Development Co., Ltd (600313.SH) and Xinjiang Korla Pear Co., Ltd (600506.SH). Therefore, this study includes 15 agricultural listed firms as shows in table 3.1.

**Table 3.1 Agricultural firms listed on Shanghai Stock Exchange List**

<table>
<thead>
<tr>
<th>NO.</th>
<th>Code</th>
<th>Firm’s Full Name</th>
<th>Firm’s Short Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>600097</td>
<td>Shanghai Kaichuang Marine International Co., Ltd</td>
<td>KCGJ</td>
</tr>
<tr>
<td>2</td>
<td>600108</td>
<td>Gansu Yasheng Industrial (Group) Co., Ltd</td>
<td>YSJT</td>
</tr>
<tr>
<td>3</td>
<td>600189</td>
<td>Jilin Forest Industry Co., Ltd</td>
<td>JLSG</td>
</tr>
<tr>
<td>4</td>
<td>600242</td>
<td>Zhongchang Marine Co., Ltd</td>
<td>ZCHY</td>
</tr>
<tr>
<td>5</td>
<td>600257</td>
<td>Duhu Aquaculture Co., Ltd</td>
<td>DHGF</td>
</tr>
<tr>
<td>6</td>
<td>600265</td>
<td>Yunnan Jinggu Forestry Co., Ltd</td>
<td>YJFC</td>
</tr>
<tr>
<td>7</td>
<td>600354</td>
<td>Gnsu Dunhuang Seed Co., Ltd</td>
<td>DHZY</td>
</tr>
<tr>
<td>8</td>
<td>600359</td>
<td>Xinjiang Talimu Agricultural Development Co., Ltd</td>
<td>XTAD</td>
</tr>
<tr>
<td>9</td>
<td>600371</td>
<td>Wanxiang Doneed Co., Ltd</td>
<td>WXDN</td>
</tr>
<tr>
<td>10</td>
<td>600467</td>
<td>Shangdong Homey Aquatic Development Co., Ltd</td>
<td>HDJ</td>
</tr>
<tr>
<td>11</td>
<td>600540</td>
<td>Xinjiang Sayram Modern Agriculture CO., Ltd</td>
<td>XSGF</td>
</tr>
<tr>
<td>12</td>
<td>600598</td>
<td>Heilongjiang Agriculture Co., Ltd</td>
<td>HACL</td>
</tr>
<tr>
<td>13</td>
<td>600962</td>
<td>SDIC Zhonglu Fruit Juice Co. Ltd</td>
<td>SDICZL</td>
</tr>
<tr>
<td>14</td>
<td>600965</td>
<td>Fortune Ng Fung Food (Hebei) Co., Ltd</td>
<td>FCWF</td>
</tr>
<tr>
<td>15</td>
<td>600975</td>
<td>Hunan New Wellfull Co., Ltd</td>
<td>NWF</td>
</tr>
</tbody>
</table>

Source: Shanghai Stock Exchange Website
3.3 Variables of Research

Based on the literature review and research journals, the following variables are used for the research:

3.3.1 Dependent variables

The dependent variables in this research are as following:

1. Return on assets (ROA)
2. Return on sales (ROS)
3. Sales Growth (SG)

3.3.2 Independent variables

The independent variables in this research are as below:

1. Liquidity as proxied by current ratio.

   According to Adams and Buckle (2003), James and John (2005), Sibel and Engin (2012), current ratio was measured as liquidity to study the correlation with firm financial performance. Maryanne and Don (2006) used quick ratio to measure as liquidity. And Jose et al. (2010) used current ratio and quick ratio to measure as liquidity. Seema et al. (2011) used current ratio and acid test ratio to measure liquidity.

2. Asset turnover as proxied by total asset turnover ratio.

   As the stated in the studied of Jose et al. (2010), Wu et al. (2010), Ding and Sha (2011), total assets turnover ratio was measured as asset utilization to study the correlation with firm financial performance. And the research of Seema et al. (2011) used total asset turnover ratio, fixed asset turnover ratio and current assets turnover.
ratio to measure as asset utilization.

3. **Leverage as proxied by debt ratio.**

   As the stated in the studied of Titman and Wessels (1988), Xiao (2005), Zhang et al. (2007) and Chen (2008), debt ratio was measured as leverage to study the correlation with firm financial performance.

4. **Economic prosperity as proxied by GDP,**

5. **Agricultural products price index as producer price index of agricultural**

3.4 **Data Collection**

   For the objective of this study, all data start from January 2006 until December 2010, totally 20 quarters and is used as a method for data collection. In the study collected the data as much as possible. These data include: return on assets (ROA), return on sales (ROS), sales growth (SG), current ratio, total asset turnover ratio, debt ratio, gross domestic product (GDP) and agricultural products price index. These data are collected from source as following:
### Table 3.2 Data Source

<table>
<thead>
<tr>
<th>Data</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>Shanghai Stock Exchange (SSE);</td>
</tr>
<tr>
<td></td>
<td>Each listed firm’s website</td>
</tr>
<tr>
<td>ROS</td>
<td>Shanghai Stock Exchange (SSE);</td>
</tr>
<tr>
<td></td>
<td>Each listed firm’s website</td>
</tr>
<tr>
<td>Sales Growth</td>
<td>Shanghai Stock Exchange (SSE);</td>
</tr>
<tr>
<td></td>
<td>Each listed firm’s website</td>
</tr>
<tr>
<td>Current Ratio</td>
<td>Shanghai Stock Exchange (SSE);</td>
</tr>
<tr>
<td></td>
<td>Each listed firm’s website</td>
</tr>
<tr>
<td>Total Asset Turnover Ratio</td>
<td>Shanghai Stock Exchange (SSE);</td>
</tr>
<tr>
<td></td>
<td>Each listed firm’s website</td>
</tr>
<tr>
<td>Debt Ratio</td>
<td>Shanghai Stock Exchange (SSE);</td>
</tr>
<tr>
<td></td>
<td>Each listed firm’s website</td>
</tr>
<tr>
<td>GDP</td>
<td>National Bureau of Statistics of China</td>
</tr>
<tr>
<td>Agricultural Products Price Index</td>
<td>National Bureau of Statistics of China</td>
</tr>
</tbody>
</table>

### 3.5 Data Analysis

This research will use regression analysis to investigate each factor affecting the financial performance of agricultural firms listed on Shanghai Stock Exchange. This research will use data of these fifteen agricultural listed firms that includes current ratio,
Multiple regression analysis is a powerful technique used for predicting the unknown value of a variable form the known value of two or more variables, it also called the predictors. By multiple regressions, it means models with just one dependent and two or more independent (exploratory) variables. The variable whose value is to be predicted is known as the dependent variable and the ones whose known values are used for prediction are known independent (exploratory) variables. Multiple regression models should be started from two independent variables.

In general, the multiple regression equation of $Y$ on $X_1, X_2, ..., X_n$ is given by:

$$ Y = a + b_1 X_1 + b_2 X_2 + \cdots + b_n X_n + e_t $$

For this study, there is return on assets (ROA) as the dependent variable for main results. To build the model that what factor that effect ROA, the model of ROA is as following:

$$ \text{ROA}_{it} = a + b_1 \text{CR}_{it} + b_2 \text{TA}_{it} + b_3 \text{DR}_{it} + b_4 \text{GDP}_{it} + b_5 \text{PPI}_{it} + e_{it} \quad (\text{Model 1}) $$

Another dependent variable is return on sales (ROS), which uses for validation of results. To build the model that what factor that effect ROS, the model of ROS is as following:

$$ \text{ROS}_{it} = a + b_1 \text{CR}_{it} + b_2 \text{TA}_{it} + b_3 \text{DR}_{it} + b_4 \text{GDP}_{it} + b_5 \text{PPI}_{it} + e_{it} \quad (\text{Model 2}) $$
The last dependent variable is sales growth (SG), which uses for validation of results. To build the model that what factor that effect SG, the model of SG is as following:

\[ SG_{it} = a + b_1 CR_{it} + b_2 TA_{it} + b_3 DR_{it} + b_4 GDP_{it} + b_5 PPI_{it} + e_{it} \]  

(Model 3)

Where \( i \) indicate the \( i \)th firm, \( t \) indicates time period, and the other variables are defined as follows:

\[
\begin{align*}
CR_t &= \text{Current ratio of firm } i \text{ at time } t \\
TA_t &= \text{Total asset turnover ratio of firm } i \text{ at time } t \\
DR_t &= \text{Debt ratio of firm } i \text{ at time } t \\
GDP_t &= \text{GDP pre capital of China of firm } i \text{ at time } t \\
PPI_t &= \text{Producer price index of agricultural products of firm } i \text{ at time } t \\
a &= \text{Constant} \\
b_1, b_2, b_3, b &= \text{Coefficient} \\
e_{it} &= \text{Error term}
\end{align*}
\]
3.6 Hypothesis

Since the objective of this research is to examine the effects of liquidity, asset utilization, leverage, economic prosperity and agricultural products price index on financial performance of agricultural firms listed on Shanghai Stock Exchange.

The main hypotheses of this research are as follows:

**Hypothesis 1**
Liquidity has positive effect on financial performance of agricultural firms listed on Shanghai Stock Exchange.

**Hypothesis 2**
Asset utilization has positive effect on financial performance of agricultural firms listed on Shanghai Stock Exchange.

**Hypothesis 3**
Leverage has negative effect on financial performance of agricultural firms listed on Shanghai Stock Exchange.

**Hypothesis 4**
Economic prosperity has positive effect on financial performance of agricultural firms listed on Shanghai Stock Exchange.

**Hypothesis 5**
Agricultural products price index has positive effect on financial performance of agricultural firms listed on Shanghai Stock Exchange.
CHAPTER 4

DATA ANALYSIS AND RESULTS

The purpose of this chapter is to discuss about the result of analysis from the data collected based the conceptual framework. The following are topics in this chapter;

4.1 Unit – Root Test

4.2 Descriptive Statistics

4.3 Multicollinearity Test

4.4 Regression Results
4.1 Unit – Root Test

To determine the factors affect financial performance of agricultural firms listed on Shanghai Stock Exchange. The Unit Root Test is used to check the stationary qualification before using the data because the non-stationary variables will influence the behavior and properties of a series and result in a spurious regression. If the variable is non-stationary, data should go for first differencing. If the stationary cannot be found at the first difference, that may require further differencing. The results from Unit Root Test show in Table 4.1.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Levin, Lin &amp; Chu Statistic</th>
<th>Prob.</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>-5.18680</td>
<td>0.0000</td>
<td>Stationary</td>
</tr>
<tr>
<td>ROS</td>
<td>-6.35813</td>
<td>0.0000</td>
<td>Stationary</td>
</tr>
<tr>
<td>SG</td>
<td>-3.65573</td>
<td>0.0001</td>
<td>Stationary</td>
</tr>
<tr>
<td>CR</td>
<td>-3.41916</td>
<td>0.0003</td>
<td>Stationary</td>
</tr>
<tr>
<td>TA</td>
<td>-3.83723</td>
<td>0.0001</td>
<td>Stationary</td>
</tr>
<tr>
<td>DR</td>
<td>-1.20070</td>
<td>0.1149</td>
<td>Non-Stationary</td>
</tr>
<tr>
<td>GDP</td>
<td>4.41278</td>
<td>1.0000</td>
<td>Non-Stationary</td>
</tr>
<tr>
<td>PPI</td>
<td>-6.60714</td>
<td>0.0000</td>
<td>Stationary</td>
</tr>
<tr>
<td>D(DR)</td>
<td>-5.71823</td>
<td>0.0000</td>
<td>Stationary</td>
</tr>
<tr>
<td>D(GDP)</td>
<td>-6.16574</td>
<td>0.0000</td>
<td>Stationary</td>
</tr>
</tbody>
</table>

Table 4.1 shows results of Unit Root Test that the probability value of variable ROA, ROS, SG, CR, TA and PPI is less than 0.05, it means variable ROA, ROS, SG, CR, TA and PPI are stationary. But the probability value of variable DR and GDP is greater than 0.05, it means variable DR and GDP are non-stationary. The first
differencing should be applied to DR and GDP to make them stationary. After first differencing DR and GDP, the probability value is less than 0.05. Therefore, variable D(DR) and D(GDP) are stationary.

4.2 Descriptive Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Median</th>
<th>Max</th>
<th>Min</th>
<th>Std. Dev.</th>
<th>Obs</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>0.007893</td>
<td>0.004821</td>
<td>1.181229</td>
<td>-0.812202</td>
<td>0.089283</td>
<td>299</td>
</tr>
<tr>
<td>ROS</td>
<td>-0.175594</td>
<td>0.032327</td>
<td>86.27030</td>
<td>-50.25405</td>
<td>6.700780</td>
<td>299</td>
</tr>
<tr>
<td>SG</td>
<td>0.239895</td>
<td>0.045842</td>
<td>23.61445</td>
<td>-1.594806</td>
<td>1.715340</td>
<td>299</td>
</tr>
<tr>
<td>CR</td>
<td>1.402807</td>
<td>1.101501</td>
<td>11.12782</td>
<td>0.006377</td>
<td>1.297423</td>
<td>299</td>
</tr>
<tr>
<td>TA</td>
<td>0.145695</td>
<td>0.134497</td>
<td>1.135032</td>
<td>0.000973</td>
<td>0.095460</td>
<td>299</td>
</tr>
<tr>
<td>D(DR)</td>
<td>-0.001070</td>
<td>-0.003690</td>
<td>2.876874</td>
<td>-3.539243</td>
<td>0.372660</td>
<td>299</td>
</tr>
<tr>
<td>D(GDP)</td>
<td>0.027950</td>
<td>0.548200</td>
<td>12.72300</td>
<td>-8.357000</td>
<td>4.318913</td>
<td>299</td>
</tr>
<tr>
<td>PPI</td>
<td>1.079265</td>
<td>1.073400</td>
<td>1.255400</td>
<td>0.933900</td>
<td>0.0927875</td>
<td>299</td>
</tr>
</tbody>
</table>

The above table summarized the data. Using descriptive statistics can show the data more intuitive understanding of the data distribution. From the table 4.2 can know the mean of each variable and Standard Deviation. This show that from 2006 to 2010, variable ROA, ROS and SG denote the financial performance, average ROA is 0.008; and its standard deviation is 0.089. The lowest ROA is -0.812 and the highest is 1.181. For ROS, its mean is -0.176 and its standard deviation is 6.701. The minimum of ROS is -50.254 and the maximum is 86.270. Finally, SG has its mean of 0.240 and standard deviation of 1.715. The lowest SG is -1.595 and the highest is 23.614.

The independent variables include CR, TA, D(DR), D(GDP) and PPI. Variable
CR denotes the liquidity, Mean of the CR is about 1.402 and its standard deviation is 1.297. The highest CR is around 11.128 and the lowest is 0.006. Variable TA denotes the asset utilization. The average TA is 0.146 and the standard deviation is 0.095, the highest value is 1.135 and the lowest value is 0.001. Variable DR denotes the leverage, the D(DR) is the first differencing of DR. The maximum value of D(DR) is 2.877 and the minimum value of D(DR) is -3.539, its mean is -0.001 and its standard deviation is 0.373. Variable GDP denotes the economic prosperity, and the D(GDP) is the first differencing of GDP. The average quarterly D(GDP) of China is 0.028 trillion Yuan, the highest value is 12.723 trillion Yuan and the lowest value is -8.357 trillion Yuan, the standard deviation is 4.319 trillion Yuan. Variable PPI denotes the agricultural products price index. Average quarterly PPI is 1.079, the standard deviation is 0.093, the highest value is 1.256 and the lowest value is 0.934. It means the inflation of agricultural products is not large.

4.3 Multicollinearity Test

Test for multicollinearity will study the high pair-wise correlations and high simple correlation coefficients because it can indicate the level of multicollinearity. If the correlation between two explanatory variables is less than 0.80, there is no problem of multicollinearity.

<table>
<thead>
<tr>
<th>Correlation</th>
<th>CR</th>
<th>TA</th>
<th>D(DR)</th>
<th>D(GDP)</th>
<th>PPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR</td>
<td>1.000000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
From the table 4.3, it shows the analysis for the correlations of independent variables in the model. It is found that the value of correlation coefficient is not above the limit value set for multicollinearity, which is less than 0.8. Therefore, there is no multicollinearity problem. All the five independent variables can be used to run the regressions.

4.4 Regression Results

In statistics, the Durbin – Watson statistic is a test statistic used to test the existing of autocorrelation (a relationship between values separated from each other by a given time lag) in the residuals (prediction errors) from a regression analysis. Durbin – Watson statistics always lies between 0 and 4. When the value of Durbin – Watson statistics must in the critical value range of Durbin – Watson statistics, there is no autocorrelation problem. As this research have 299 observations and 5 independent variables, checking the value from Durbin – Watson Statistics Value Table (Appendix F) can get \( d_L = 1.718 \) and \( d_U = 1.820 \). The critical value range of Durbin – Watson statistics is between 1.718 (dL) and 2.180 (4 – dU). The result of testing of Durbin – Watson statistic must have the value between 1.718 and 2.180 in order to avoiding the autocorrelation problem. The results from testing autocorrelation are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Value1</th>
<th>Value2</th>
<th>Value3</th>
<th>Value4</th>
<th>Value5</th>
</tr>
</thead>
<tbody>
<tr>
<td>TA</td>
<td>0.269986</td>
<td>1.000000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D(DR)</td>
<td>-0.014191</td>
<td>-0.070071</td>
<td>1.000000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D(GDP)</td>
<td>-0.043438</td>
<td>0.150240</td>
<td>0.059831</td>
<td>1.000000</td>
<td></td>
</tr>
<tr>
<td>PPI</td>
<td>-0.022966</td>
<td>0.016094</td>
<td>-0.025411</td>
<td>0.122203</td>
<td>1.000000</td>
</tr>
</tbody>
</table>
4.4.1 Regression Results of Dependent Variable ROA

Table 4.4.1.1 Regression results of ROA

<table>
<thead>
<tr>
<th>Variables</th>
<th>C</th>
<th>CR</th>
<th>TA</th>
<th>D(DR)</th>
<th>D(GDP)</th>
<th>PPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>0.011032</td>
<td>-0.002619</td>
<td>0.114815</td>
<td>-0.070023</td>
<td>0.0000985</td>
<td>-0.015076</td>
</tr>
<tr>
<td>Std. Error</td>
<td>0.058742</td>
<td>0.003968</td>
<td>0.054667</td>
<td>0.013323</td>
<td>0.001172</td>
<td>0.053597</td>
</tr>
<tr>
<td>t – Statistic</td>
<td>0.187812</td>
<td>-0.660008</td>
<td>2.100269</td>
<td>-5.255848</td>
<td>0.083982</td>
<td>-0.281280</td>
</tr>
<tr>
<td>Prob.</td>
<td>0.8512</td>
<td>0.5098</td>
<td>0.0366</td>
<td>0.0000</td>
<td>0.9331</td>
<td>0.7787</td>
</tr>
<tr>
<td>R – squared</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.104083</td>
</tr>
<tr>
<td>F – statistic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6.807846</td>
</tr>
<tr>
<td>Prob.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.000005</td>
</tr>
<tr>
<td>Durbin – Watson stat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.223362</td>
</tr>
</tbody>
</table>

From the table 4.4.1.1, the regression equation of ROA can be written down as

\[
\text{ROA} = 0.011032 - 0.002619 \times \text{CR} + 0.114815 \times \text{TA} - 0.070023 \times \text{D(DR)} \\
\text{Prob.} = (0.187812) - (-0.660008) \times (2.100269)^* - (-5.255848)**
\]
+ 0.0000985 D(GDP) - 0.015076 PPI (equation 1)

$(0.083982)$ $(-0.281280)$

* = significant at the level of 0.05

** = significant at the level of 0.01

From the equation of ROA, it can see that the probability in the model equal to 0.000005 less than 0.01 at confidential level 99% that means all independence variables in the model can use together for predicting dependence variable (ROA) at significant statistic 0.01. $R^2$ equal to 0.104083 means that, the estimate equation can explain the change of variables ROA by 10.4083%. The probability of TA equal to 0.0366 that means TA is significant at 0.05 level. TA is a factor affecting the ROA. TA changes one unit will make ROA changed by 0.114815 unit in the same direction. The probability of D(DR) equal to 0.0000 that means D(DR) is significant at 0.01 level. D(DR) is a factor affecting ROA. D(DR) changes one unit will make ROA changed by 0.070023 unit in the opposite direction.

However, there is a problem of autocorrelation in the model of ROA. Because the Durbin – Watson statistic of this model is 2.223362 greater than 2.180, therefore, it needs to be addressed the autocorrelation of error function by ARMA process.

<p>| Table 4.4.1.2 Adjusting regression results of ROA |</p>
<table>
<thead>
<tr>
<th>Variables</th>
<th>C</th>
<th>CR</th>
<th>TA</th>
<th>D(DR)</th>
<th>D(GDP)</th>
<th>PPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>0.008786</td>
<td>-0.002526</td>
<td>0.113625</td>
<td>-0.080172</td>
<td>0.0000897</td>
<td>-0.013084</td>
</tr>
<tr>
<td>Std. Error</td>
<td>0.056985</td>
<td>0.004217</td>
<td>0.055348</td>
<td>0.014020</td>
<td>0.001390</td>
<td>0.051857</td>
</tr>
</tbody>
</table>
From the equation of ROA, it can see that the probability in the model equal to 0.000007 less than 0.01 at confidential level 99% that means all independence variables in the model can use together for predicting dependence variable (ROA) at significant statistic 0.01. \( R^2 \) equal to 0.114421 means that, the estimate equation can explain the change of variables ROA by 11.4421%. The probability of TA equal to 0.0410 that means TA is significant at 0.05 level. TA is a factor that affects ROA. TA changes one unit will make ROA changed by 0.113625 unit in the same direction. The probability of
D(DR) equal to 0.0000 that means D(DR) is significant at 0.01 level. D(DR) is a factor that affects ROA; and the coefficient of D(DR) is negative number that means D(DR) is inversely correlated with ROA. The changing of D(DR) affecting in the opposite direction to the changing of financial performance of agricultural firms listed on Shanghai Stock Exchange. D(DR) increases one unit will make ROA decreased by 0.080172 unit.

According to the results of Durbin – Watson statistic, it found that there is no problem of autocorrelation in the model of ROA, because Durbin – Watson statistic is 2.142937 (between 1.718 and 2.180), means that, disturbance in the equation are independently. So, this equation is the final equation of ROA.

### 4.4.2 Regression Results of Dependent Variable ROS

<table>
<thead>
<tr>
<th>Variables</th>
<th>C</th>
<th>CR</th>
<th>TA</th>
<th>D(DR)</th>
<th>D(GDP)</th>
<th>PPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>-2.245590</td>
<td>0.207601</td>
<td>3.874653</td>
<td>2.792499</td>
<td>-0.030047</td>
<td>1.128622</td>
</tr>
<tr>
<td>Std. Error</td>
<td>4.591056</td>
<td>0.310155</td>
<td>4.272581</td>
<td>1.041269</td>
<td>0.091635</td>
<td>4.188981</td>
</tr>
<tr>
<td>t – Statistic</td>
<td>-0.489123</td>
<td>0.669345</td>
<td>0.906865</td>
<td>2.681821</td>
<td>-0.327902</td>
<td>0.269426</td>
</tr>
<tr>
<td>Prob.</td>
<td>0.6251</td>
<td>0.5038</td>
<td>0.3652</td>
<td>0.0077</td>
<td>0.7432</td>
<td>0.7878</td>
</tr>
</tbody>
</table>

From the table 4.4.2.1, the regression equation of ROS can be written down as following:

- **R-squared**: 0.028409
- **F-statistic**: 1.713441
- **Prob.**: 0.131342
- **Durbin – Watson stat**: 2.460880
\[ \text{ROS} = -2.245590 + 0.207601 \text{ CR} + 3.874653 \text{ TA} + 2.792499 \text{ D(DR)} \]
\[ (-0.489123) \quad (0.669345) \quad (0.906865) \quad (2.681821) \]
\[ -0.030047 \text{ D(GDP)} + 1.128622 \text{ PPI} \]
\[ (-0.327902) \quad (0.269426) \]

From the equation of ROS, it shows that the probability in the model equal to 0.131342 that means no independent variables in this model affect ROS significantly. Therefore, the model of ROS cannot be used to analyze the financial performance of agricultural firms listed on Shanghai Stock Exchange.

### 4.4.3 Regression Results of Dependent Variable SG

**Table 4.4.3.1 Regression results of SG**

<table>
<thead>
<tr>
<th>Variables</th>
<th>C</th>
<th>CR</th>
<th>TA</th>
<th>D(DR)</th>
<th>D(GDP)</th>
<th>PPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>-2.580198</td>
<td>-0.108738</td>
<td>0.025476</td>
<td>-1.663562</td>
<td>0.006436</td>
<td>2.749055</td>
</tr>
<tr>
<td>Std. Error</td>
<td>1.091301</td>
<td>0.073724</td>
<td>1.015599</td>
<td>0.247511</td>
<td>0.021782</td>
<td>0.995728</td>
</tr>
<tr>
<td>t – Statistic</td>
<td>-2.364331</td>
<td>-1.474924</td>
<td>0.025085</td>
<td>-6.721152</td>
<td>0.295460</td>
<td>2.760851</td>
</tr>
<tr>
<td>Prob.</td>
<td>0.0187</td>
<td>0.1413</td>
<td>0.9800</td>
<td>0.0000</td>
<td>0.7679</td>
<td>0.0061</td>
</tr>
<tr>
<td>R – squared</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.162282</td>
<td></td>
</tr>
<tr>
<td>F – statistic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>11.35190</td>
<td></td>
</tr>
<tr>
<td>Prob.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.000000</td>
<td></td>
</tr>
<tr>
<td>Durbin – Watson stat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.242603</td>
<td></td>
</tr>
</tbody>
</table>
From the table 4.4.3.1, the regression equation of SG can be written down as following:

\[ \text{SG} = -2.580198 - 0.108738 \text{ CR} + 0.025476 \text{ TA} - 1.663562 \text{ D(DR)} \]

\[ (-2.364331) \quad (-1.474924) \quad (0.025085) \quad (-6.721152)** \]

\[ + 0.006436 \text{ D(GDP)} + 2.749055 \text{ PPI} \quad \text{(equation 4)} \]

\[ (0.295460) \quad (2.760851)** \]

* = significant at the level of 0.05

** = significant at the level of 0.01

From the equation of SG, it shows that the probability in the model equal to 0.000000 less than 0.01 at confidential level 99% that means all independence variables in the model can use together for predicting dependence variable (SG) at significant statistic 0.01. \( R^2 \) equal to 0.162282 means that, the estimate equation can explain the change of variables SG by 16.2282%. The probability of D(DR) equal to 0.0000 that means D(DR) is significant at 0.01 level. D(DR) is a factor affecting SG. D(DR) changes one unit will make SG changed by 1.663562 unit in the opposite direction. The probability of PPI equal to 0.0061 that means PPI is significant at 0.01 level. PPI is a factor affecting SG; and the coefficient of PPI is positive number that means PPI is positively correlation with SG. The changing of PPI affect in the same direction to the changing of SG. PPI increases one unit will make SG increased by 2.749055 unit.

However, there is a problem of autocorrelation in the model of SG. Because the Durbin – Watson statistic of this model is 1.242603 which is less than 1.718,
therefore, it needs to be addressed the autocorrelation of error function by ARMA process.

<table>
<thead>
<tr>
<th>Variables</th>
<th>C</th>
<th>CR</th>
<th>TA</th>
<th>D(DR)</th>
<th>D(GDP)</th>
<th>PPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>-2.878397</td>
<td>-0.143041</td>
<td>1.197517</td>
<td>-1.135150</td>
<td>0.001815</td>
<td>2.896642</td>
</tr>
<tr>
<td>Std. Error</td>
<td>1.513365</td>
<td>0.124483</td>
<td>0.944156</td>
<td>0.282945</td>
<td>0.016574</td>
<td>1.370820</td>
</tr>
<tr>
<td>t – Statistic</td>
<td>-1.901985</td>
<td>-1.149083</td>
<td>1.268347</td>
<td>-4.011913</td>
<td>0.109488</td>
<td>2.113072</td>
</tr>
<tr>
<td>Prob.</td>
<td>0.0582</td>
<td>0.2515</td>
<td>0.2057</td>
<td>0.0001</td>
<td>0.9129</td>
<td>0.0355</td>
</tr>
<tr>
<td>R – squared</td>
<td>0.318555</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F – statistic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>21.58149</td>
<td></td>
</tr>
<tr>
<td>Prob.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.000000</td>
<td></td>
</tr>
<tr>
<td>Durbin – Watson stat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.765366</td>
<td></td>
</tr>
</tbody>
</table>

From the table 4.4.3.2, the regression equation of SG after AR1 process can be written down as following:

\[
SG = -2.878397 - 0.143041 \; CR + 1.197517 \; TA - 1.135150 \; D(\text{DR})
\]

\[
\times (-1.901985) \times (-1.149083) \times (1.268347) \times (-4.011913)\
\]

\[
+ 0.001815 \; D(\text{GDP}) + 2.896642 \; PPI
\]

\[
(\text{equation 5})
\]

\[
\times (0.109488) \times (2.113072)\
\]

* = significant at the level of 0.05

** = significant at the level of 0.01
From the equation of SG, it shows that the probability in the model equal to 0.000000 less than 0.01 at confidential level 99% that means all independence variables in the model can use together for predicting dependence variable (SG) at significant statistic 0.01. $R^2$ equal to 0.318555 means that, the estimate equation can explain the change of variables SG by 31.8555%. The probability of D(DR) equal to 0.0001 that means D(DR) is significant at 0.01 level. D(DR) is factor affecting SG. D(DR) changes one unit will make SG changed by 1.135150 unit in the opposite direction. The probability of PPI equal to 0.0355 that means PPI is significant at 0.05 level. PPI is a factor affecting SG. The changing of PPI affect in the positively direction to the changing of the SG of agricultural firms listed on Shanghai Stock Exchange. PPI increases one unit will make SG changed by 2.896642 unit in the same direction.

According to the results of Durbin – Watson statistic, it found that there is no problem of autocorrelation in the model of SG, because Durbin – Watson statistic is 1.765366 (between 1.718 and 2.180), means that, disturbance in the equation are independently. So, this equation is the final equation of SG.
CHAPTER 5

CONCLUSION, DISCUSSION AND RECOMMENDATION

According to the results of analysis, this chapter will makes conclusion and
discussion about the factors affecting financial performance of agricultural firms listed on
Shanghai Stock Exchange and gives some suggestions.

5.1 Conclusion

5.2 Discussion

5.3 Implication of the Study

5.4 Research Recommendation

5.5 Limitations and Further Research
5.1 Conclusion

This study examined the factors affecting financial performance of agricultural firms listed on Shanghai Stock Exchange. This study is based on quarterly data of five variables starting from January, 2006 to December 2010, totally 20 quarters. The data includes financial information, economic information and agricultural industrial information of a sample 15 companies over the period 2006 – 2010. Financial performance of firms was measured by three financial indicators: return on assets, return on sales and sales growth. Liquidity measured by current ratio. Asset utilization measured by total asset turnover. Leverage measured by debt ratio. Economic prosperity measured by GDP. Agricultural products price index measured by producer price index of agricultural products.

In analyzing, some economic approaches were applied the data. First, testing unit root of the original data found that debt ratio and GDP are non-stationary. Thus, the first difference transformations of the original data was used; and then, testing the correlation of each independent variable and autocorrelation among residuals by using multiple regression with Ordinary Least Squares (OLS) Method.

Summarizing the results, this study considered just the variables that have significantly statistic higher than 0.05 and the confidential level more than 95% to be the factors that affecting to financial performance of agricultural firms listed on Shanghai Stock Exchange. The results found that the variables that affecting to financial performance of agricultural firms listed on Shanghai Stock Exchange are asset utilization (total asset turnover ratio), leverage (debt ratio) and agricultural products price index,
because they are statistically significant of the 0.05 level. Asset utilization and agricultural products price index have positive correlation with firm financial performance, but, leverage shows negative correlation with firm financial performance.

Furthermore, the results found that the liquidity and economic prosperity have no effect on the changing of financial performance of agricultural firms listed on Shanghai Stock Exchange.

Table 5.1 Summarize for testing hypothesis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Hypothesis</th>
<th>Conclusions</th>
<th>Accept/Reject Hypothesis</th>
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</thead>
<tbody>
<tr>
<td>Liquidity</td>
<td>Affect financial performance</td>
<td>Did not effect</td>
<td>Reject</td>
</tr>
<tr>
<td>Asset Utilization</td>
<td>Affect financial performance</td>
<td>Positively related</td>
<td>Accept</td>
</tr>
<tr>
<td>Leverage</td>
<td>Affect financial performance</td>
<td>Negatively related</td>
<td>Accept</td>
</tr>
<tr>
<td>Economic Prosperity</td>
<td>Affect financial performance</td>
<td>Did not effect</td>
<td>Reject</td>
</tr>
<tr>
<td>Agricultural Products</td>
<td>Affect financial performance</td>
<td>Positively related</td>
<td>Accept</td>
</tr>
<tr>
<td>Price Index</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

According to the table 5.1 which are summarized the study of the factors affecting financial performance, in case of agricultural firms listed on Shanghai Stock Exchange. It found that the asset utilization changing in the positive direction with financial performance, the hypothesis is accepted; the leverage changing in the negative
direction with financial performance, the hypothesis is accepted; agricultural products price index changing in the positive direction with financial performance, the hypothesis is accepted. The hypothesis of liquidity and economic prosperity are rejected in this study, so they could not explain the change in financial performance of agricultural firms listed on Shanghai Stock Exchange.

5.2 Discussion

5.2.1 Liquidity

The result of the study shows that the hypothesis of liquidity is rejected, indicates that liquidity has no effect on financial performance of agricultural firms listed on Shanghai Stock Exchange. This result is not consistent with the literature review. However, empirical studies of Adams and Buckle (2003); Jose et al. (2010); Seema et al. (2011); Sibel and Engin (2012) showed that there was a strong positive relationship between liquidity and firms’ financial performance.

Liquidity is a ratio to measure a firm’s ability to payback short-term obligations. The ability of payback short-term debt of agricultural firms listed on Shanghai Stock Exchange is no effectively so as the ability to payback long-term debt. Therefore, it is the reason why liquidity is not significant affecting on financial performance of agricultural listed on Shanghai Stock Exchange.
5.2.2 Asset Utilization

The result shows that asset utilization positively affects financial performance (ROA) of agricultural firms listed on Shanghai Stock Exchange. This result was consistent with the findings of Jose et al. (2010); Wu, Li and Zhu (2010); Ding and Sha (2011); Seema et al. (2011), the faster firm’s total asset turnover, the higher efficiency of asset utilization and the better performance the firm has.

The positive correlation between asset utilization and financial performance shows that the total asset turnover ratio is higher, the firm uses its assets more productively and firm’s financial performance is better. As stated in Wu et al. (2010), asset utilization made a great contribution to the profitability level of firm, and had a significant positively effecting on the firm’s financial performance.

5.2.3 Leverage

In the ROA model, found that leverage has a negative correlation with financial performance of agricultural firms listed on Shanghai Stock Exchange (coefficient equal to -0.080172, probability less than 0.05); in the SG model, found that leverage has a negative correlation with firms’ financial performance (coefficient equal to -1.663562, probability less than 0.05). The negative result is in the line with the findings of Rajan and Zingals (1995); Xiao (2005); Wu, Li and Zhu (2010).

China’s agricultural listed firms prefer long-term debt financing. The result found that debt ratio is higher, the financial performance is worse. Because the firm has a high
debt meaning the interest expense that the firm needs to pay is also high. The high interest expense leads to low net income. Therefore, the firm’s financial performance will get a negative effect from high debt. As stated in Mo (2008), a firm that has a capital structure with a high debt will result in a bad firm performance.

5.2.4 Economic Prosperity

The result shows that the hypothesis of economic prosperity is rejected, so economic prosperity has no effect on financial performance of agricultural firms listed on Shanghai Stock Exchange. However, Deng et al. (2009) stated the higher rate of GDP growth, the economic is boom and the level of profitability is high, then the firm performance is better. Besides, Chen (2010), John and Riyas (2011) also got the same result with Deng et al. (2009). Therefore, the result of this study is not consistent with the literature review.

For China, gross domestic product (GDP) is the end results of the production activities of all the resident units within China borders in a given period. This study used the quarterly GDP, and the quarterly GDP has a growing trend. The average GDP between 2006 and 2010 is 7.6929 trillion yuan. However, the production of agricultural industry is a low percentage in GDP and has a decreasing trend year by year. Therefore, GDP is not sufficient to explain the financial performance of agricultural listed on Shanghai Stock Exchange.


5.2.5 Agricultural Products Price Index

According the result of the model of SG shows that agricultural products price index has effect on the financial performance of agricultural firms listed on Shanghai Stock Exchange in the positive direction. This result was consistent with the literature review. The early empirical studies demonstrated a positive relationship between agricultural products price index and financial performance of agricultural firms listed on Shanghai Stock Exchange (Demirguc-Kunt and Maksimovic, 1999; Booth et al., 2001; Deng et al., 2009; Ma, 2011).

Andy (2001) pointed out that agricultural producer price index (PPI) is the changes in prices that agricultural producer received from producing and selling the agricultural commodities. So, PPI increase will lead to increase the revenue of agricultural firms, and it will improve the firm performance.

5.3 Implication for the Study

This paper selected a number of factors to analyze correlation with financial performance; and used multiple regressions to study factors affecting the financial performance of agricultural firms listed on Shanghai Stock Exchange. From the empirical research to explore the characteristics of the financial performance of agricultural firms listed on Shanghai Stock Exchange.

According to the result of this study, showed that the financial performance of agricultural firms listed on Shanghai Stock Exchange and the asset utilization have a positive relationship. So, higher asset utilization will lead to high financial performance of
agricultural firms. Asset utilization reflects the firm’s asset management. Total asset turnover ratio reflects the operational ability of firms’ assets from the overall perspective. The positive correlation showed that the assets operational ability is very important for agricultural listed firms. It will directly affect the ability and speed of firm’s revenue increasing and the scale expansion.

This study showed that the financial performance of agricultural firms listed on Shanghai Stock Exchange and the leverage have a negative relationship. So, lower leverage will bring high financial performance of agricultural firms. The negative relation of financial performance and leverage could be expected on the fact that increases in debt leads to increases in the firm’s financial and bankruptcy risk. It also reflected the soft constraint condition in debt treatment of agricultural listed firms. In China, due to many factors, the bankruptcy system exists in name only to lead to listed firms is unable to establish risk awareness. Debt has no governance role in the decreasing financial performance. The average debt ratio of agricultural firms listed on Shanghai Stock Exchange is around 63.16%. It means the capital structure with high liabilities is not suitable for the development of financial performance of agricultural firms listed on Shanghai Stock Exchange. This passive liability increased the debt risk of firm and lead to the development of long-term debt financing. Sample firms showed a trend that the debt ratio is higher, the financial performance is worse. It reflected agricultural firms listed on Shanghai Stock Exchange did not take advantage of the liabilities financing. The financial leverage was not effectively used in agricultural firms listed on Shanghai Stock Exchange.
According to the result of this study, the financial performance of agricultural firms listed on Shanghai Stock Exchange and the agricultural products price index have a positive relationship. So, higher agricultural products price index will cause high financial performance of agricultural firms. An increase in producer prices of finished goods will result in consumer prices. This will cause an increase in firm income and better the firm performance. Therefore, agricultural listed firms need to improve the quality and added value of agricultural products to make sure the producer prices of finished goods can increase within reasonable prices.

5.4 Research Recommendation

From the results of this study, asset utilization, leverage and agricultural products price index are significant factors of financial performance of agricultural firms listed on Shanghai Stock Exchange. Therefore, there are four recommendations as following. The first recommendation is concluded by asset utilization; the second recommendation and the third recommendation are concluded by leverage; and the fourth recommendation is concluded by agricultural products price index.

First, Agricultural listed firms should develop targeted management plan based on industry characteristics; improve the management level of agricultural listed firms; build its brand image and create a good firm’s culture through learning advanced management experience and combined with the firm features; strengthen the ability of solvency and asset management of agricultural firms; speed up asset turnover to adapt the firm’s development.
Second, Agricultural listed firms should make full use of financial leverage and tax shield to reduce the weighted average cost of capital; reasonable control long-term debt ratio avoid the high financial risk and improve the financial performance of agricultural firms listed on Shanghai Stock Exchange.

Third, Agricultural listed firms should improve the bankruptcy system to solve the problem of the inefficient use of long-term debt financing and soft constraints of debt. A sound firm bankruptcy system is precondition of the positively correlated between leverage and firms financial performance. Establishing the security system of paying debts and improving bank monitoring for agricultural listed firms in order to leverage has a positive effect on agricultural listed firms.

Fourth, Agricultural listed firms should develop products to meet market demand; improve the quality and added value of the agricultural products; Agricultural listed firms should enhance the technological innovation capability and financial strength of agricultural listed firms. Financial strength is the foundation of the creation and operation of firms. Technological innovation is relied on by survival and development of firms. Agricultural listed firms should establish cooperation relationship with scientific research institutions to get the support in the development and promotion of new varieties.

5.5 Limitations and Further Research

The limitations of this study are mainly reflected in:
First, the sample size of agricultural listed firms is very small. According to China Securities Regulatory Commission, there are 1718 listed firms in China but only have 46 agricultural listed firms that accounted for only about 2.68% of the total number. The data of this study collected financial statement of only 15 agricultural firms listed on Shanghai Stock Exchange over 5 years, total 300 observations.

Second, this study used the quantitative research method and searched the secondary data from listed firm’s website and National Bureau of Statistics. The data may be not accurate, reliable, and authentic or has typing mistake to lead to the analysis result is not accurate. So, the further research can be considered the quantitative research method combined with qualitative research method and collected the primary data by interviewing and surveying etc. to make sure the data is accurate.

Third, the result of this study showed that GDP is not significant for financial performance of agricultural firms listed on Shanghai Stock Exchange. So, the further research can be considered the gross agricultural production to be the independent variable. And there are many factors affecting financial performance, it is difficult to analysis each aspect. This study focused on liquidity, asset utilization, leverage, economic prosperity and agricultural products price index, but didn’t analysis other aspects.

In addition, the analysis idea of this study is very clear and the analysis method is feasible. This study also can provide some contributions for the further research. Further researches can consider the issues suggested by this study in other type of firms or other factor of each aspect when analysis the factors affecting financial
performance of listed firms. This study would add to the growing body of knowledge on financial performance of listed firms.
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APPENDICES
APPENDIX A

Unit – ROOT TEST
Panel unit root test: Summary
Series: ROA
Date: 11/20/12   Time: 20:20
Sample: 2006Q1 2010Q4
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

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** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.
Panel unit root test: Summary
Series:  ROS
Date: 11/20/12   Time: 20:21
Sample: 2006Q1 2010Q4
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

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** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.
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**Newey-West automatic bandwidth selection and Bartlett kernel**  
**Balanced observations for each test**

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**Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.**
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Sample: 2006Q1 2010Q4
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

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** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.
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Sample: 2006Q1 2010Q4
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

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** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.
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** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.
Panel unit root test: Summary
Series: D(DR)  
Date: 11/20/12   Time: 20:39  
Sample: 2006Q1 2010Q4  
Exogenous variables: Individual effects  
User-specified lags: 1  
Newey-West automatic bandwidth selection and Bartlett kernel  
Balanced observations for each test

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<th>Prob.**</th>
<th>Obs</th>
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<tr>
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<td>15</td>
</tr>
<tr>
<td>Null: Unit root (assumes individual unit root process)</td>
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<tr>
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<td></td>
<td>-8.03909</td>
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<tr>
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<tr>
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** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.
Panel unit root test: Summary
Series: D(GDP)
Date: 11/20/12  Time: 20:39
Sample: 2006Q1 2010Q4
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

<table>
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<tr>
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<th>Prob.**</th>
<th>Cross-sections</th>
<th>Obs</th>
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** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.
APPENDIX B

DESCRIPTIVE STATISTICS
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<th>ROS</th>
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<th>TA</th>
<th>DDR</th>
<th>DGDP</th>
<th>PPI</th>
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Observations 299 299 299 299 299 299 299 299
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<th>SG</th>
<th>CR</th>
<th>TA</th>
<th>DDR</th>
<th>DGDP</th>
<th>PPI</th>
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APPENDIX D

REGRESSION
### 2.1

Dependent Variable: ROA  
Method: Panel Least Squares  
Date: 11/20/12   Time: 20:28  
Sample: 2006Q1 2010Q4  
Periods included: 20  
Cross-sections included: 15  
Total panel (unbalanced) observations: 299

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<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
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R-squared 0.104083   Mean dependent var 0.007893  
Adjusted R-squared 0.088794   S.D. dependent var 0.089283  
S.E. of regression 0.085227   Akaike info criterion -2.067141  
Sum squared resid 2.128233   Schwarz criterion -1.992884  
Log likelihood 315.0375   Hannan-Quinn criter. -2.037420  
F-statistic 6.807846   Durbin-Watson stat 2.223362  
Prob(F-statistic) 0.000005
Dependent Variable: ROA
Method: Panel Least Squares
Date: 11/20/12  Time: 20:29
Sample (adjusted): 2006Q2 2010Q4
Periods included: 19
Cross-sections included: 15
Total panel (unbalanced) observations: 284
Convergence achieved after 10 iterations

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R-squared 0.114421  Mean dependent var 0.008029
Adjusted R-squared 0.095239  S.D. dependent var 0.091588
S.E. of regression 0.087117  Akaike info criterion -2.018781
Sum squared resid 2.102275  Schwarz criterion -1.928842
Log likelihood 293.6669  Hannan-Quinn criter. -1.982723
F-statistic 5.964960  Durbin-Watson stat 2.142937
Prob(F-statistic) 0.000007

Inverted AR Roots -.08
### 2.3

Dependent Variable: ROS  
Method: Panel Least Squares  
Date: 11/20/12   Time: 20:30  
Sample: 2006Q1 2010Q4  
Periods included: 20  
Cross-sections included: 15  
Total panel (unbalanced) observations: 299

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<tr>
<th>Variable</th>
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<th>Std. Error</th>
<th>t-Statistic</th>
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R-squared 0.028409   Mean dependent var -0.175594  
Adjusted R-squared 0.011829   S.D. dependent var 6.700780  
S.E. of regression 6.661030     Akaike info criterion 6.650288  
Sum squared resid 13000.21     Schwarz criterion 6.724545  
Log likelihood -988.2181     Hannan-Quinn criter. 6.680009  
F-statistic 1.713441     Durbin-Watson stat 2.460880  
Prob(F-statistic) 0.131342
2.4

Dependent Variable: SG
Method: Panel Least Squares
Date: 11/20/12   Time: 20:30
Sample: 2006Q1 2010Q4
Periods included: 20
Cross-sections included: 15
Total panel (unbalanced) observations: 299

<table>
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<th>t-Statistic</th>
<th>Prob.</th>
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Adjusted R-squared 0.147986   S.D. dependent var 1.715340
S.E. of regression 1.583338   Akaike info criterion 3.776810
Sum squared resid 734.5388   Schwarz criterion 3.851066
Log likelihood -558.6331   Hannan-Quinn criter. 3.806531
F-statistic 11.35190   Durbin-Watson stat 1.242603
Prob(F-statistic) 0.000000
## Dependent Variable: SG

**Method:** Panel Least Squares  
**Date:** 11/20/12  **Time:** 20:30  
**Sample (adjusted):** 2006Q2 2010Q4  
**Periods included:** 19  
**Cross-sections included:** 15  
**Total panel (unbalanced) observations:** 284  
**Convergence achieved after 12 iterations**

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**Adjusted R-squared** 0.303794  **S.D. dependent var** 1.757584  
**S.E. of regression** 1.466510  **Akaike info criterion** 3.627987  
**Sum squared resid** 595.7303  **Schwarz criterion** 3.717926  
**Log likelihood** -508.1741  **Hannan-Quinn criter.** 3.664045  
**F-statistic** 21.58149  **Durbin-Watson stat** 1.765366  
**Prob(F-statistic)** 0.000000  

**Inverted AR Roots** 0.44
APPENDIX E

DURBIN – WATSON STATISTICS VALUE TABLE
(dL and dU is significant at the level of 5%, \( k \) is the number of independent variables, \( n \) is the number of sample)

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BIOGRAPHY

Ms. Wei Wei was born on 09 July 1988. She received a Bachelor Degree in International Business and trade from the GUANGXI UNIVERSITY FOR NATIONALITY in year 2010.