

CHINA'S IMPORT DEMAND FOR WHEAT

BY

HAIGUANG SHI

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MASTER OF SCIENCE

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ABSTRACT

Wheat accounts for more than 50 percent of the world's traded grain. The volume of wheat trade varies annually according to buying and supplying patterns of few large wheat importers and exporters. China is one of the largest wheat importers in the world. While China's fluctuating patterns of wheat imports bring some uncertainties to the world wheat market, a more thorough understanding of China's wheat import patterns and future demand appears important.

This study provides an empirical analysis of China's wheat import patterns based on statistical data from 1961 to 1990. Several short-run and long-run models were employed to derive the empirical patterns of China's wheat trade operations and effects of exogenous variables on the pattern. Demand is forecasted with a long-run distributed-lag model for the period of 1991 to 2000.

The major statistically significant factors affecting the level of China's wheat imports are found to be: China's foreign trade balance, real income per capita, trade policy, the currency exchange rate, total domestic grain output, and domestic transportation capacity. China's projected annual wheat imports by the year 2000 are 28 million and 38 million metric tons in low and high growth scenarios respectively.

Study shows that China's increasing real income per capita, trade surplus, increasing total grain output, and supportive trade policy positively affect import demand while the depreciation of Chinese currency and insufficient transportation capacity affect it negatively.

The results of the best long-run model, which contains variables of lagged import demand, foreign trade balance, real income per capita, trade policy impact, total grain output, exchange rate, and transportation capacity, indicate that China's wheat imports are elastic to exchange rate, total grain output, and domestic grain transportation capacity. The transportation capacity elasticity of 2.4 is the highest. The long-run model has a high R^2 value of 0.95 and a desirable Durbin-Watson value of 2.03.

The results suggest that China's import demand for wheat has a statistically significant pattern. The projected imports for the 1990s indicate an increasing trend of wheat imports for China. However, the import volumes projected by this study are lower than the projections of similar studies.

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LIST OF ABBREVIATIONS

CEROILFOOD	China National Cereals, Oils, and Foodstuffs Import and Export Corporation
COSCO	China Ocean Shipping Corporation
EEC	European Economic Community
ERS	Economic Research Service
FAO	Food and Agriculture Organization
GATT	General Agreement on Tariffs and Trade
GGB	Government Grain Bureau
GNP	Gross National Product
USDA	United States Department of Agriculture

CHAPTER 1

INTRODUCTION

1.0 General Introduction

Wheat trade is one of the major activities in the world grain market. In the 1991 - 1992 crop year, 108.2 million tons of wheat were traded, which accounted for 20 percent of the world total wheat production and 54 percent of its total grain traded respectively¹.

The prices and traded volume in the world wheat market depend highly on the behaviour of a few large wheat importing countries. China is currently the world's largest wheat consumer and one of the largest wheat importers. In 1990, China imported 12.5 million tons of wheat. China's wheat imports have accounted for nearly 10 percent of the world traded volume of wheat annually between 1960 and 1990². The volume of China's wheat import, however, has fluctuated widely over the last three decades. The domestic agricultural performance is the government's main consideration in determining levels of wheat imports. China's agriculture supports 21.5 percent of the world population with only 6.97 percent of the world arable land³. In 1990, it produced 99 million tons of

¹USDA, ERS, World grain situation and outlook, (Washington DC, December, 1992), 31-32.

²China Statistics Bureau, China Statistical Yearbook, 1991, (Beijing: China Statistics Publishing House).

³Ibid., 819-820.

wheat⁴. Although China is currently the largest wheat producer in the world, its output has never met the actual demand from the fast growing population. Imports of wheat from other countries, therefore, have been an important way to overcome the shortage of domestic wheat supply. During the pre-reform period from 1961 to 1978, China's annual wheat imports fluctuated between 2 million tons and 8 million tons per year. After the agricultural reforms were launched in 1978, the wheat imports were decreased to 5.63 million tons by 1985 due to increased domestic grain output. Imports reached a record high level of 14.55 million tons in 1987 due to the ever increasing growing population and the crop failure between 1985 and 1987.

The growing importance of China's wheat trade in the world wheat market since the late 1970s has prompted a great deal of research. Much was aimed at deriving quantitative frameworks to project future wheat import requirements. Such research, however, was often difficult due to unawareness of China's secretive decision-making process for grain imports, frequent changes in trade policies for imports, and limited statistical data. As a result, the forecasted high volume wheat imports were often inconsistent with China's actual volume of imports. A thorough understanding of China's import patterns, therefore, appears important for prediction of future wheat demand. Neoclassical economic analysis of China's wheat demand is insufficient because the demand is not purely market determined. Instead, a political economy approach should be considered as well in understanding the decision-making process which underlies China's purchases of wheat on the world market.

⁴Ibid.

This study examines China's past purchasing patterns and decision-making processes, reveals the impact of influential factors, and also develops a framework to forecast China's future wheat demand. Previous studies focused on the impact of China's population, grain shortage, and limited foreign exchange reserves. This study also takes into account, besides the above factors, the impact of the recent policy reforms, transportation capacity, increasing income, foreign currency exchange rate, and Chinese potential future agricultural production.

1.1 Statement of the Problem

Wheat imports by China are internationally recognized issues because China is the largest wheat consumer in the world. The large imports of wheat by China have shown a substantial impact on the world wheat market since 1978 and challenged the stability of world wheat prices. However, China's wheat imports did not attract a notable amount of research until the early 1980s due mainly to China's isolation from the western world during the 1960s and the early 1970s. Statistical data and related economic information were not widely available to western researchers during that period. It was commonly believed that China was not able to access many wheat export sources and the wheat imports were rigid when China had a ideological confrontation with the western countries. However, China's wheat imports varied and shifted from one exporter to another rapidly during the 1970s. The rapid shift captured much attention of researchers in the late 1970s and the early 1980s. Since then China's wheat imports have become a frequently debated and controversial topic for many research professionals.

Many researches on estimation of China's import demand with common economic variables, such as the level of domestic production, the size of China's population, and the relative prices of various grains, have not been very successful. The transportation constraints and policy impact were main neglected factors in the previous studies. Scarce data sources also impeded appropriate application of desired theoretical frameworks in estimation and forecast.

China's wheat import pattern has been influenced dramatically by the reforms in China's agriculture. Changes in grain output resulted from the reform frequently shifted trade policies as China's trade practices are usually guided by the domestic self-sufficiency policy. Impact of continual agricultural reforms, therefore, becomes an important consideration in the study of wheat trade pattern and projection of future import demand.

China's target grain output for the year 2000 was set at 500 million metric tons by the Chinese government to meet the self-sufficiency goal. Much of the concerns have resulted in the question being asked whether China is able to achieve this goal, and whether there will still be any import demand for wheat once this target output is eventually reached.

1.2 Objectives of the Study

This study is designed to answer some of the above-mentioned unsolved questions, to examine the real driving mechanism of China's wheat imports from both supply and demand perspectives, and to forecast future demand based on a more consistent data set,

desired empirical models, and consideration of recent policies.

The specific objectives of this study can be described as follows:

1. To make an overall review of China's wheat economy, trade policy issues, and the related problems in its agricultural sector.
2. To develop appropriate empirical models for the estimation of China's wheat import demand with consideration of recent economic reforms.
3. To forecast China's import demand for wheat between 1991 and 2000, and to discuss the implications suggested by the study.

1.3 Organization of the Study

This study is presented in the following five chapters:

Chapter 1 introduces the Chinese agricultural regions, grain and wheat production, consumption, and trade situation. It also presents a statement of the problem, objectives of this study and a review of the related studies.

Chapter 2 presents the historical background of China's wheat trade and depicts the current situations of major components involved in wheat imports such as trade policy and pricing systems.

Chapter 3 discusses the conceptual frameworks and important variables used in this study based on characteristics of the wheat trade and China's economic situation. Assumptions, hypotheses, and brief description of data used in the study are also given in this chapter.

Chapter 4 presents all empirical results of this study and evaluations of the short-

run and long-run models, and also forecasts the import demand between 1991 and 2000.

Chapter 5 concludes this study by summarizing findings and pointing out implications.

The Appendix lists all tables, data used in the study, and some reference data as well.

The References list selected important references used in the study.

1.4 Agricultural and Wheat Regions in China

To understand China's import demand for wheat, a basic understanding of Chinese agricultural production is necessary. This is because import demand largely depends on Chinese grain yields and harvest volumes. Yields and harvest volumes vary largely from one region to another depending on weather conditions and agricultural development levels. China's major geographical agriculture regions are shown in Figure 1.1.

As sown area and production output vary from year to year, it is necessary to choose an average year's figures to represent each region's performance. For China, 1987 was chosen in Table 1.1, Table 1.2, and Table 1.3 to illustrate regional crop distribution of sown area and crop production.

Table 1.1 shows the total sown area of each region and percentage of sown area for each crop within a region. The sown area represents the importance of each region to the country's grain production. The percentage of sown area to each crop represents the crop contribution to the production within the region.



Figure 1.1 China's Agricultural Region

Table 1.1 Regional Distribution of Sown Area in China, 1987

Region	Sown area (1,000 hectare)	Percentage of sown area by crop within each region (%)				
		Rice	Wheat	Corn	Soybean	Other
Northeast	16,173	9.2	10.2	33.6	20.3	26.7
North	36,695	2.0	33.7	19.7	5.9	38.7
Northwest	17,110	1.9	33.2	14.1	3.6	47.2
East	21,917	33.1	20.8	3.8	5.0	37.3
Central	20,295	49.7	7.9	2.5	2.4	37.5
South	13,286	56.8	1.2	4.2	3.1	34.7
Southwest	19,482	24.5	14.1	16.5	2.0	42.9

Source: USDA, ERS, China: Agriculture and Trade Report, (Washington DC, July 1990), 33.

China currently ranks the first in the world in wheat harvested area with 29 million hectares, which accounts for about 14 percent of the world's total wheat sown area⁵. The most important region for wheat production in China is the north region. It has the largest area sown to grains (more than 36 million hectares) and the highest percentage of sown area planted to wheat production (33.7 percent), representing in a total of 12.37 million hectares for wheat production. In the northwest region, the percentage of sown area for wheat is almost as high as in north region, but the sown area for wheat, 5.68 million hectares, is only about half of the wheat sown area of the north region due to its smaller grain sown area. East is another region important to wheat production in

⁵USDA, ERS, World Grain Situation and Outlook, (Washington DC, December, 1992), 25, 32.

China although the most favourable crop in this region is rice. The total sown area for wheat in the east is about 4.56 million hectares. Corn is more popular in the northeast China compared to the rest of country. Rice is primarily concentrated in the south and the central regions.

Table 1.2 presents each region's production share by crop in China's total production output for the year 1987. Table 1.3 shows regional production of 4 main crops in the same year. China's wheat production accounted for about 18 percent of the world's total wheat output⁶, among which about 48 percent of the production is contributed by north region. Production is not necessarily parallel to the sown area in the region because it also depends on average yield per hectare. The east region produces more wheat than northwest although the sown area in east is less.

Table 1.2 Regional Share of Nation's Production by Crop in China, 1987
(percentage)

Region	Rice	Wheat	Corn	Soybean
Northeast	5	4	33	44
North	2	48	37	24
Northwest	1	15	11	6
East	25	19	4	14
Central	31	5	2	5
South	20	0	1	3
Southwest	16	9	12	4

Source: USDA, ERS, China: Agriculture and Trade Report, (Washington DC, July 1990), 33.

⁶Ibid.,

Table 1.3 Regional Production of Main Crops in China, 1987
(1,000 tons)

Region	Rice	Wheat	Corn	Soybean
Northeast	8,721	3,511	26,341	5,361
North	3,488	42,129	29,534	2,924
Northwest	1,744	13,165	8,780	731
East	43,604	16,676	3,192	1,706
Central	54,069	4,388	1,596	609
South	34,883	0	798	366
Southwest	27,906	7,899	9,579	487
Total	174,415	87,768	79,820	12,184

Source: USDA, ERS, China: Agriculture and Trade Report, (Washington DC, July 1990), 33.

Distribution of crops tends to vary according to economic returns within geographical and climate limitations such as heat, moisture, and length of frost-free period. The north and central regions are China's most intensely farmed areas with high average yields. Water resources are critical to crop production in these regions as irrigated wheat and wet paddy rice are prominent crops. In the south region, climatic conditions are unfavourable to wheat and corn production. Therefore, wheat for human consumption and coarse grains for animal consumption in this region have to depend upon supplies either from foreign countries or from northern China.

1.5 Grain Production and Consumption in China

1.5.0 Characteristics of China's Grain Production and Consumption