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Chinese Market Access Barriers of U.S Oilseeds and Grains

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Abstract

China was admitted into the WTO in December 2001 and this raised the hopes of the US that China will open up to agricultural trade with the US. However, this potential has not been realized. The goal of this study is to determine the impacts of trade impediments and barriers of the market access of US oilseeds and grains in China. A market access variable that was obtained by dividing the total value of U.S soybean and corn exports to China by U.S agricultural G.D.P was regressed on China's per capita income, exchange rate of the yuan to the dollar, arable land to labor ratio in the U.S and a dummy variable representing China's WTO accession. The result found per capita income to have a positive impact on market access of U.S oilseeds and grains in China. Exchange rate of the yuan to the dollar was found to be significant and has a negative impact on market access. However, China's WTO accession and the arable land to labor ratio in the U.S did not have any significance on the market access of U.S oilseeds and grains.

Key Words: Market Access: Market Access Barriers, U.S Oil seeds and Grains, Import Demand; Gravity Model

CHINESE MARKET ACCESS BARRIERS OF U.S OILSEEDS AND GRAINS

1. Introduction

Trade between the U.S and China rose dramatically after the normalization of diplomatic relations between these two countries on January 1, 1979. Many American firms were eager to enter into trade relations with China because of the vast potential that a country of that size holds. Nominal per capita gross domestic product (GDP) of China grew from 379 Yuan to 6,534 Yuan between the periods of 1979 to 1999. In 1999, China's trade volume reached 360.7 billion dollars, ranking 9th in the world. China emerged to become an important player in the world trading system; it was in the interest of the U.S and the World for China to be admitted into the World Trade Organization (WTO).

In December 2001, China was finally admitted into the WTO. With a population of over 1 billion people and a per capita income increasing at 10 percent annually, China has a potential for increasing its consumption of food annually. Among the sectors most significantly affected by China's WTO accession is Agriculture and this raised the hopes of the U.S that China will open up to U.S agricultural trade. In market access, China pledged to lower agricultural tariffs from 22 percent to 17.5 percent by 2004 with certain products of most importance to the U.S dropping from 31 percent to 14 percent (USDA 2008). Also new market access opportunities were created by establishing tariff rate quotas (TRQs) on commodities such as oilseeds and grains that were traditionally handled by state trading enterprises.

However, China's policy makers are using various strategies such as a devalued currency to continue exports and impede imports. China does not maintain a market based floating exchange rate. Between 1995 and July 2005, China pegged its currency to the U.S dollar at about 8.28 Yuan to a dollar. Making Chinese goods cheaper than U.S goods. This strategy among others

resulted in a U.S trade deficit with China. By 2010, the U.S China deficit had reached 252 billion dollars (U.S Census Bureau, Foreign Trade Statistics 2010).

China is the largest importer of U.S soybean, but the import of U.S corn into China has not been very successful. The simple answer to why China has not imported much U.S corn is that Chinese corn is much cheaper than U.S corn. The import of soybean on the other hand keeps on increasing. Chinese officials opened the market to soybeans in the 1990's as a strategy to promote the livestock industry (by increasing the supply of soy meal). Since then imports have grown faster than anyone expected. Corn on the other hand is considered a strategic commodity so officials are less willing to allow corn imports into China.

Since China's accession to the WTO in December 2001, China's utilization of grain TRQs has been very low, being only about 12 percent on average from 2002-2008. This is in sharp contrast to anticipation of many analysts who believed that China's grain imports would grow significantly after its WTO accession. Import quotas are not distributed to private (non-state) importers early, and quotas for state traders are distributed even later, giving potential buyers very little time to arrange purchases. China's regulations on labeling food containing genetically modified organisms are also an additional obstacle to corn imports. Genetically modified corn will require safety certificates and a waiting period of up to 270 days for approval to import to china (as is the case for soybeans). Even conventional corn varieties may face import problems, since it will be difficult to prove that no transgenic corn or soybean material is present in a shipment. Importers are usually afraid to import corn because the quarantine authorities might reject the shipments if they find unapproved types of genetically modified corn in the shipment. Therefore, how Chinese officials decide to implement the GMO regulations for corn will have an important effect on imports (Gale, 2002).

Spiraling international shipping costs also reduces the competitiveness of U.S corn in China. For instance, in 2003 rising Chinese corn prices would normally have made U.S corn competitive in Chinese markets. However, shipping costs to Asia more than doubled to as much as \$55 per ton, largely due to China's enormous demand for shipments of soybeans, oil and steel that tied up a large share of the world's ocean freight capacity. On the other hand, subsidies are given for buying and transporting domestic corn across the country, reducing the price of domestic corn (Gale, 2002).

This study examines the factors affecting import demand of U.S oilseeds and grains to China.

The overall objective of this study is to describe the impacts of trade impediments and barriers of the Chinese market access of U.S grain and oilseed.

The specific objectives are:

1. To describe the market access barriers to U.S oilseeds and grains and assess the trend of market access of U.S oilseeds and grains to China
2. To econometrically determine the effects of these factors on U.S grain and oilseed exports.

The rest of the paper progresses as follows. Section 2 provides a brief literature review on market access and the gravity import demand model. Section 3 focuses on description and assumptions of the methodology, data used and their sources. Section 4 is a presentation of the results and discussion and section 5 draws a conclusions based on the findings. This is followed by the references used for this paper.

2. Literature Review

Foreign trade is an important component of any economy generally accounting for a significant share of a country's GDP. According to the U.S Department of Agriculture, the U.S is now the world's largest agriculture exporter.

There are a number of measures that a country may use to restrict imports. The most common form of such restrictions is tariffs on imported goods. Non-tariff barriers to market access also exist for goods, such as technical standards, antidumping suits, and import quotas, import licensing and variable levies. There is a general view that U.S businesses are being unfairly hurt by barriers to access in foreign markets. This has raised demands for market access requirements. While policies to increase market access have received much attention in recent years, little attention has been paid to the issue of implementing these policies. Irwin, (1994) notes that the United States never seems concerned about the mechanisms by which ‘voluntary’ bilateral agreements are carried out and acts as if the government can carry it out. It is well understood that enforcement is critical to the success of any results oriented policy. It is somewhat surprising that implementation has been ignored.

While Ethier and Horn (1993) and Cronshaw and Markusen (1995) among others examine results oriented policies, Greaney, (1995) specifically incorporates the problem of implementation in her analysis. In her model, the government enforces the market share agreement by threatening the home firm with a financial penalty in the event the import target is not met. There has been a general conclusion that market access requirements reduce competition. According to Krishna, Roy and Thursby (1997), if the level of the instrument used by the government to enforce the market access requirement can be manipulated by the firms, the result is higher prices. Also, previous theoretical analysis by Irwin (1994), Greaney (1996) suggest that market access requirements also reduce competition. An exception to this conclusion is however found in Krishna and Morgan (1995) showing that there exists conditions under which completion is increased when a market access requirement on a specific market is implemented by threats on a related market.

One factor that determines market access is exchange rates. The issue of China's exchange rate regime has an effect on market access of U.S agricultural products in China. There is a compelling case that the Chinese currency, the renminbi is significantly undervalued. When exchange rate is used to provide protection to domestic firms, it is through undervaluation, the analysis of which owes a great deal to Dornbusch's (1976) theory of overshooting. An undervalued exchange rate protects domestic firms from imports and gives domestic firms greater incentives to export. The Chinese Renminbi was pegged to the U.S dollar from 1995 to July 2005, as the exchange rate of the Renminbi (RMB) against the U.S dollar did not change much over that period. The shift to a managed float and the 2% revaluation of the RMB, announced on July 21, 2005 has not resulted in a significant flexibility as the RMB remains closely managed in narrow margins of fluctuations. As in every pegged or de facto pegged regime, the suitability of the parity could be questioned on the grounds that it is decided by the country's monetary authorities instead of resulting from the forces of supply and demand. Generally speaking, pegged currencies could be thought of as more prone to misalignment, even if floating currencies also suffer from this snag (Coudert & Couharde, 2007). In the case of China, the issue has become especially important in recent years as China's role in international trade is soaring.

3. Methodology and Data

Methodology

China has currently set up a tariff rate quota for corn. The effect of a tariff rate quota on trade depends on excess demand of imports. The in-quota value of 7.3 million metric tons of corn has a tariff of 1%. However, if the quota exceeds the 7.2 million metric tons, a tariff of 50% will be put on the import value. Soybean on the other hand has no quota and has a tariff of 3%.

However, for unprocessed commodities, there is a value added tax (VAT) of 13%. This raises the

effective duty to 14% for corn. Therefore for a \$1million worth of corn that is imported into China, the importer will end up paying:

$$1.13 \times 1.01 \times \$1\text{million} = \$1.14 \text{ million dollars.}$$

For soybeans, there is no quota and the tariff is 3%. There is also a 13% VAT on soybean imports. For \$1million worth of soybean imports, the importer will end up paying:

$$1.13 \times 1.03 \times \$1 \text{ million} = \$1.164 \text{ million.}$$

This makes domestic corn and soybean much cheaper than imported U.S soybean and corn. However, Chinese officials opened the market to soybeans in the 1990's as a strategy to promote the livestock industry by increasing the supply of soymeal. U.S soybean has a higher oil content, uniform size and overall quality. Corn on the other hand is considered a more strategic commodity; therefore officials are less willing to allow corn imports. Generally, corn produces a larger volume of output per hectare than soybean, so the strategy of focusing domestic production on corn and importing more soybean allowed China to focus its land on getting a maximum amount of production from their land.

For the second objective, a gravity import demand model is used to analyze Import demand of US grains and oilseeds in China. According to Linneman (1986) and Bergstrand (1985, 1989), a gravity model is a reduced form equation from the partial equilibrium of demand and supply systems. From consumer theory, the import demand equation for a commodity for the importing country (China) can be derived by maximizing the constant elasticity of substitution (CES) utility function (U_{kj}) subject to income constraint:

$$Uk_j = \left(\sum_{i=1}^N X_{ki}^{\theta} \right)^{1/\theta} \quad (1)$$

Where:

X_{ki} = the quantity of the commodity k imported from country i

It is assumed that the commodity can be differentiated by country of origin. Therefore, the exponent $\theta_j = (\phi_j - 1)/\phi_j$ where ϕ_j is the CES among imports. Consumption expenditures are limited by the income constraints (Y_j) of importing country j .

$$Y_j = \sum P_{ji} X_{ji} \text{ where } P_{ji} = P_{ji}^{*} WTO_{ji} C_{ji} / E_{ji} \quad (2)$$

Where:

P_{ji} = the unit price of country i 's commodity sold in country j 's market;

X_{ji} = The quantity of country i 's commodity sold in country j 's market

WTO_{ji} = Dummy Variable for importing country i 's accession into the WTO

C_{ji} = cost of shipping commodity from country i to country j ; and

E_{ji} = Exchange rate of country j 's currency in terms of i 's currency.

For this gravity-import demand model, the unique characteristics and policies associated with imports of the commodities are incorporated. These effects can be captured in variables that aid and hinder trade flows. However, since there has not been any variation in TRQ's over the years, dummy variable representing the potential effect of China's WTO accession on U.S grain and oilseed imports into China before and after China joined the World Trade organization will be created. The years after China joined the WTO will be denoted by 1, otherwise 0. Exchange rate is constructed as the ratio of the Chinese Yuan to the US dollar. The national disposable per capita income of China is in U.S dollars. Also, a variable measuring the ratio of arable land to labor in the U.S will be included in this model to measure agricultural productivity in the U.S.

The dependent variable, U.S oilseeds and grains market access variable was constructed by dividing the total export value of U.S corn and soybean to China. The empirical gravity model to measure Chinese import demand of U.S grains and oilseeds is specified as follows:

$$MRKA_{jit} = \beta_0 + \beta_1 PCI_{jt} + \beta_2 EXRATE_{jit} + \beta_3 ARBL_{it} + \beta_4 WTO_{jt} + \varepsilon_{it} \quad (3)$$

Where:

i = U.S. and j = China

$MRKA_{jit}$	Market Access variable which is the total value of corn and soybeans exported from the US into China divided by the total value of US agricultural GDP in year t
PCI_{jt}	The Per capita income in China in time t
$EXRATE_{jit}$	Exchange rate of the Chinese Yuan to the US dollar in time t
$ARBL_{it}$	Arable land to labor ratio in the US in time t.
WTO_{jt}	Dummy variable representing the years before and after China's WTO accession
ε_{it}	error term.

All variables except the dependent variable and the dummy variable were transformed into natural logs. Thus the model to be estimated is:

$$MRKA_{jit} = \beta_0 + \beta_1 \ln PCI_j + \beta_2 \ln EXRATE_{jit} + \beta_3 \ln ARBL_{it} + \beta_4 WTO_{jt} + \varepsilon_{it} \quad (4)$$

Data

The gravity model is applied to panel data for the period 1983 to 2008 for U.S. exports of corn and soybean into China. Data on export values (in \$ 1000) are from foreign agricultural services (FAS) at <http://www.fas.usda.gov/gats/default.aspx>. Data for exchange rate of the Yuan to the dollar and the per capita income of China was obtained from the Economics Research division

on <http://www.ers.usda.gov/Data/macroeconomics/>. The data for the arable land was obtained from the FAO website on <http://www.fao.org/corp/statistics/en/> and the data for labor in the agricultural sector in the U.S. was obtained from the US Bureau of labor statistics on <http://www.census.gov/eos/www/naics/>.

Since China joined the WTO in 2001, dummy variables for WTO membership signifies this political procedure greatly. The WTO dummy variable was constructed with 0 representing periods before China joined WTO otherwise 1. Entry years were obtained from the WTO website.

The statistical package for the social sciences (SPSS) is the statistical software that was used to estimate the model. Problems with zero dependent variables was present. If a zero import value is present for a particular year, the mean was taken of the value of the year before and after the year of zero imports and the mean value was used. The log-linear model in (5) (all the explanatory variables were in natural logs) was estimated using ordinary least squares (OLS).

$$MRKA_{jit} = \beta_0 + \beta_1 \ln PCI_j + \beta_2 \ln EXRATE_{jit} + \beta_3 \ln ARBLit + \beta_4 WTO_{jt} + \varepsilon_{it} \quad (5)$$

4. Results and Discussion

To assess the trend of U.S market access of oilseeds and grains in China over the years, the market access variable was plotted to examine trend over time. From figure 4.1 the value of the exports or the amount of market access for U.S oilseeds and grains provided by China was very low from 1985 to 1994. This could possibly be a result of the series of devaluations and reforms in China in the 1980's and early 1990's. However, China opened its country to the imports of U.S oilseeds from 1995 as a means of promoting its livestock sector. This can be seen from the diagram in an increase in market access from 1995. After China's WTO accession, China's

soybean imports continued to increase even though not much corn was been imported. However, it can be seen from Figure 4.1 that the value dipped in 2002 and 2006. This could possibly be because there were absolutely no shipments of U.S corn to China in both years. The cost of shipping, tariffs and taxes pushed the cost of U.S grains above the cost of Chinese grain. This resulted in a higher price of U.S corn well above the cost of Chinese corn.

To examine the empirical validity of the gravity model with respect to market access of US oilseeds and grains in China from 1983 to 2008, equation (5) is estimated. The descriptive statistics of the variables in the model are reported in table 4.1. On average, the value of US soybeans exported to China from 1983 to 2008 is 10.4 billion dollars. This statistic is no surprise since China is currently the largest importer of U.S soybean. However, the average value of U.S corn exported into China from 1983 to 2008 is 412 million dollars.

After China's accession into the WTO, it was expected that China's corn imports will increase but this has not been realized and can be seen that China's accession is not having much of an impact on its corn imports. The mean agricultural GDP for the U.S was 134.9 million dollars with a minimum and maximum of 72.6 million dollars and 196.8 million dollars respectively. The mean percapita income for China is 1000 dollars with a minimum and maximum of 275 dollars and 2,365 dollars respectively. The exchange rate of the Chinese Yuan to the U.S dollar ranged from 2 Yuan to 9 Yuan per dollar with the average exchange rate of 6.54 Yuan to a dollar from 1983 to 2008. The arable land to labor ratio in the U.S has a minimum ratio of 52 and a maximum ratio of 90. Since the dependent variable was in natural logs, we had to convert coefficients into elasticity's for easy interpretations.

Table 4.2 indicates the elasticities and significance level of the of the regression equation that was estimated. The model has an adjusted R-squared of .78 which confirms that seventy- eight

percent of the variation of market access of US soybean and corn in China can be explained by the independent variables.

Per capita income is found to be positive and significant at the 1 percent significance level. This is expected and implies that income has a positive impact on demand. The coefficient of 2.0573 for per capita income indicates that a one percent increase in per capita income will increase import demand of corn and soybean to China by 2 percent. This result is consistent with Brestal et al (2002), Miljkovic et al (2002), Gale and Lohmar (2002). They all found that import demand is positively related to income and stimulates increase in demand for goods and services. This implies that with a rising per capita income in China, the U.S should continue to endeavor to export into the Chinese market because increasing per capita income will back demand.

Exchange rate is significant at the 5 percent significance level and has an elasticity coefficient of -1.424. This means that a one percent depreciation of the Chinese Yuan relative to the U.S dollar will result in a decline in market access by about 1 percent in China. This supports the theory that an appreciated dollar with respect to the Chinese Yuan will result in a decrease in imports because imports become relatively expensive. This result is consistent with the studies by Kost (1976), Batten and Belongia (1986) and Orden (1986). Chambers and Just (1981) in their study of US soybean export to Japan, using a time series data found exchange rate to be significant and negative. Therefore assuming the bilateral exchange rate between the U.S dollar and the Chinese yuan is 1:1, since the U.S has a comparative advantage over China in producing corn and soybean into China at a cheaper rate, the U.S can gain a larger market share in China. U.S Arable land to labor ratio was not significant. Also the dummy variable representing effects of China's WTO accession on market access of U.S oilseeds and grains was not significant at any

significant statistical level. This comes as no surprise since market access of U.S oilseeds and grains into China has not changed much since China's WTO accession.

5. Conclusion

The purpose of this study was to describe the impacts of trade impediments and barriers of the Chinese market access of U.S oilseeds and grains and to econometrically determine the effects of these factors on U.S grain and oilseeds exports to China. Gravity – import demand model was estimated to determine the Chinese market access for U.S oilseeds and grains. The ratio of U.S exports of soybean and corn to U.S Agricultural GDP was regressed on exchange rate of the yuan to the dollar, per capita income in China, arable land to labor ratio in the U.S and a dummy variable representing years before and after China's WTO accession. One noteworthy finding was China's WTO accession has not played any significant role in increasing market access of U.S oilseeds and grains in China. However exchange rate of the Yuan to the dollar and China's per capita income are the major factors affecting China's imports of U.S corn and soybean. An increase in China's corn import was expected to be one of the main effects of China's accession into the World Trade Organization. China made promises that were expected to affect its corn industry. Instead, China's corn imports have not lived up to expectations. Soybean, on the other hand has been a better success story. China continues to import U.S soybean and is currently the largest export market for U.S soybean.

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Appendix

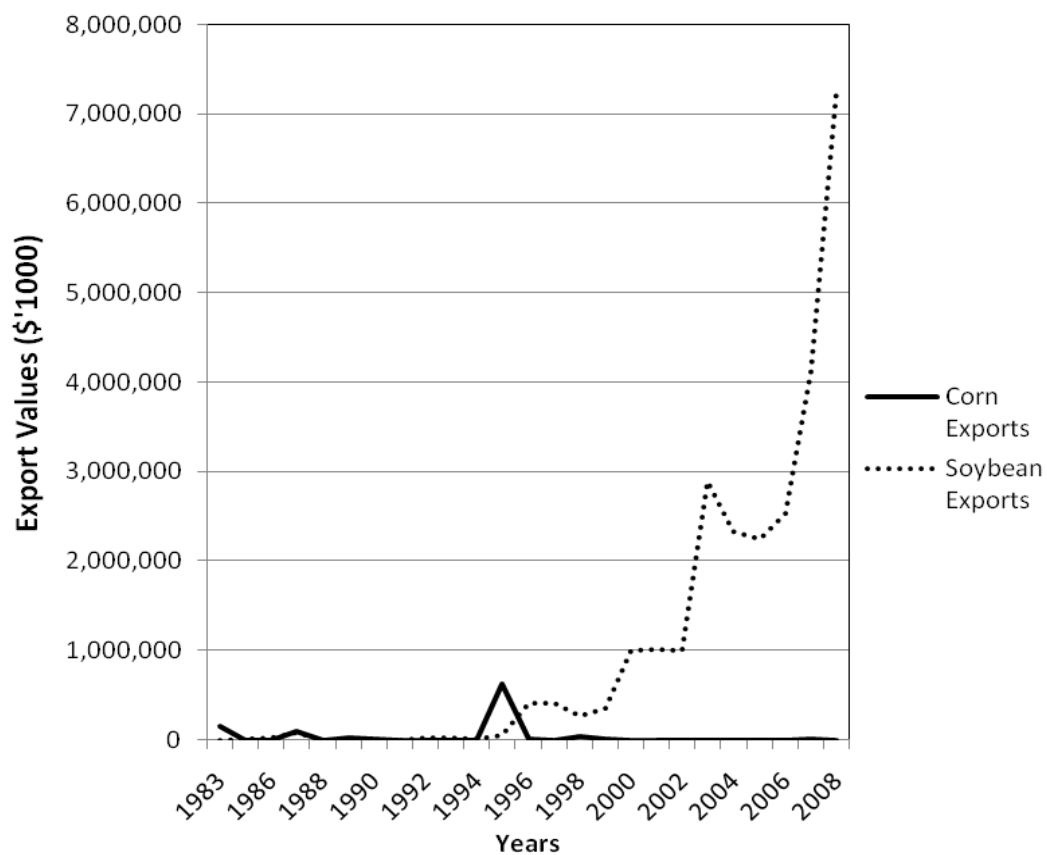


Figure 1.1. U.S. Corn And Soybean Exports To China (1983-2008)

Table 3.1. Effects Of China's Market Access Barriers On The U.S.

Market Access Issue	Pre WTO Accession Conditions	Post WTO Accession Conditions	Impacts on the United States
Sanitary & Phytosanitary Measures (SPS)	China regularly imposed unscientific SPS barriers on US oilseeds and grains	China promised to eliminate unscientific SPS barriers	Greater access to China for U.S corn and soybean
Subsidies	China subsidized its agricultural sector. Chinese corn was sold in the global market at a prices significantly below those in the domestic market	China promised to eliminate export subsidies on agricultural products	Elimination of export subsidies benefits U.S corn producers because it competes with Chinese corn both in China and in international markets
Trading Right	Only State enterprises designated by the Chinese government could engage in import and export activities	Private trade was introduced between private parties in agriculture	An increase in U.S export opportunities for corn and oilseeds

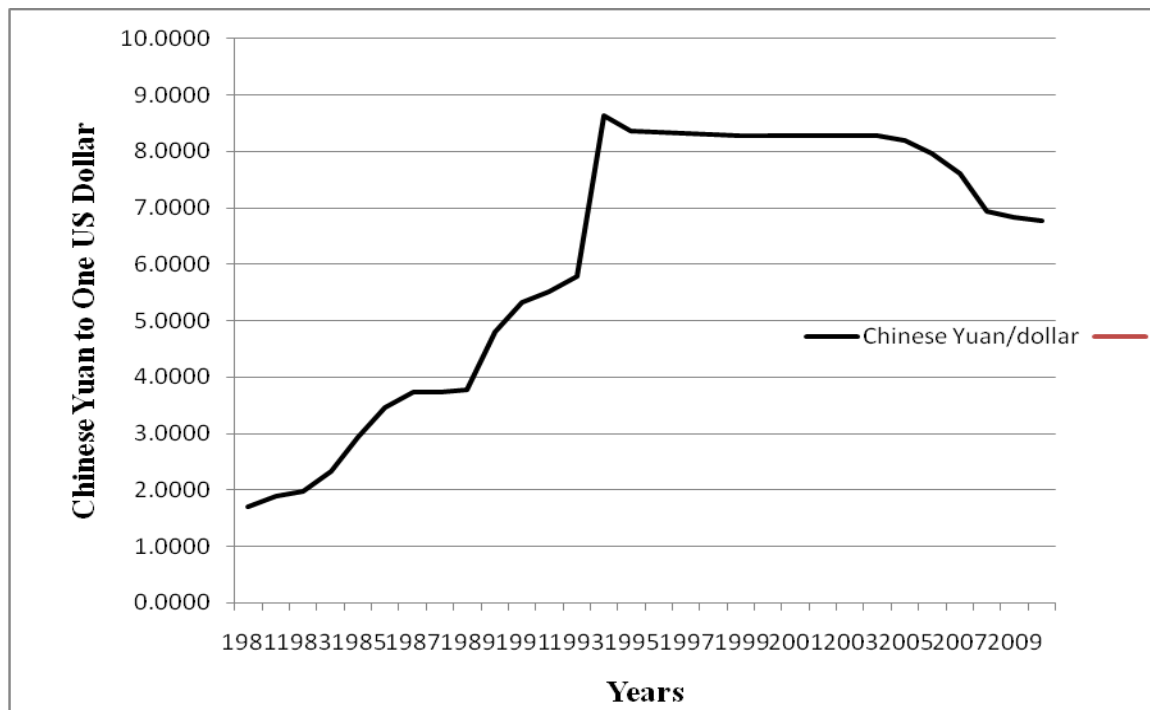


Figure 3.2. U.S. CHINA EXCHANGE RATE (1981-2009)

Source: St Louis Federal Reserve Bank

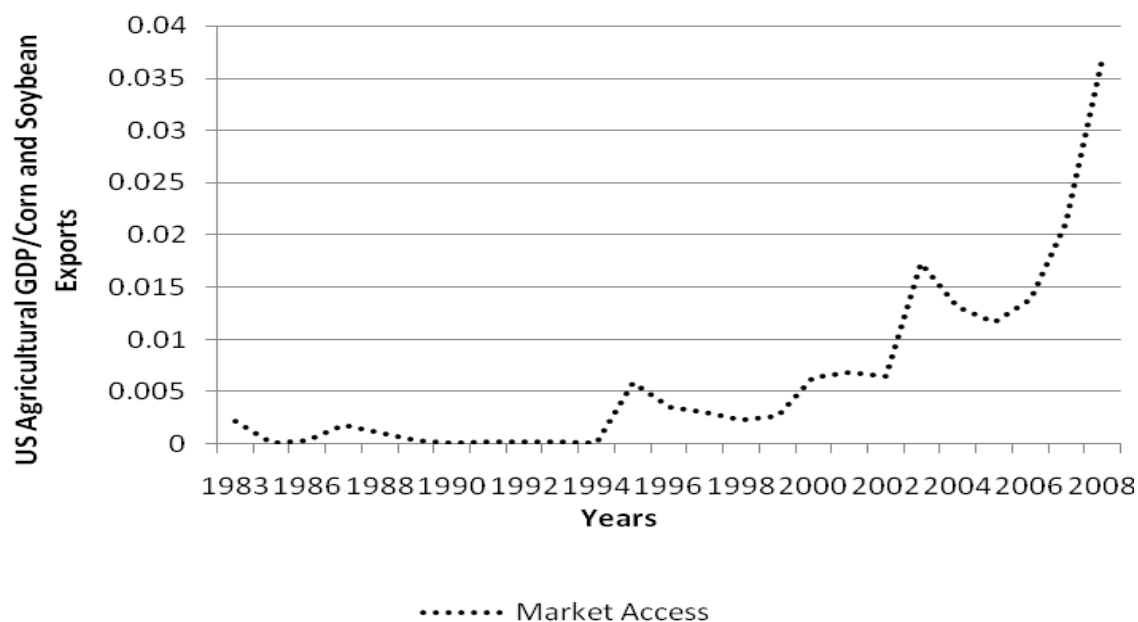


Figure 4.1. Trend Of Market Access Of U.S. Oilseeds And Grains In China

Table 4.1. Descriptive Statistics

Variable	N	Minimum	Maximum	Sum	Mean
AgriculturalGDP	25	72,623,353	196,897,157	3,372,826,783	1.35E8
Corn	25	0	629,253	1,030,163	41,206.52
Soybean	25	0	7,259,676	26,084,549	1,043,381.96
PCI	25	275	2365	25,011	1,000.44
EXRATE	25	2	9	163	6.54
ARBL	25	52	90	1667	66.67
WTO	25	0	1	.29	.464
MRKA	25	0.00000961	0.036874534	0.157967462	0.006318698
Valid N listwise)	25				

Table 4.2. Results Of The Estimated Coefficients.

Variable	Coefficients	Elasticity	T-Ratio
Intercept	-.069		-2.497
lnPCI	.013	2.0573*	3.625
lnEXRATE	-.009	-1.424**	-2.690
lnARBL	.001	0.1583	-.692
WTO	.002		.614

$R^2 = .857$

Adjusted $R^2 = .827$

(*) – Significant at 0.01

(**)-Significant at 0.05

Dependent Variable: Market Access defined as Value of Total US Corn and
Soybean export/US Agriculture GDP