Trade Liberalization and Agricultural Terms of Trade in China: Price Scissors Revisited

Colin A. Carter[1] and Jing Zhu[2]

[1] Department of Agricultural and Resources Economics,
University of California, Davis, U.S.
Email: cacarter@ucdavis.edu

[2] College of Economics and Management, Nanjing Agricultural University, China

Email: CrystalZhu@njau.edu.cn

Contributed Paper prepared for presentation at the International Association of Agricultural Economists Conference, Beijing, China, August 16-22, 2009

Trade Liberalization and Agricultural Terms of Trade in China: *Price Scissors Revisited*[*]

Abstract: With China's accession to the WTO, concerns have arisen over the possible negative welfare impacts on domestic agricultural producers. The broad concern is that China's domestic agricultural prices will be pushed down even further, leading to a greater widening of the gap between rural and urban incomes. It is widely believed that declining price ratio of agricultural to industrial products, the so-called "price scissors", is one of the major reasons for increasing rural-urban income differences over the past decades. Therefore, improving the terms of trade in favor of agricultural products is a broad policy goal in China. But is this possible with the country joining the WTO?

While there is a general perception that the price scissors have negatively affected China's agriculture and that trade liberalization will worsen the situation, empirical work on price scissors in China, and the relationship to openness, is scarce. In this paper, we use data from 1978-2005 to estimate the impact of China's trade openness on the relative price of domestic agricultural to industrial products. We find that the domestic agricultural-industrial terms of trade have not exhibited a declining trend, and that trade openness in fact exerts positive impacts on the terms of trade in favor of agricultural products. This finding implies that trade openness improves the economic welfare of China's agricultural producers.

Keywords: *Trade openness; China's price scissors; Rural-urban income gap*

JEL codes: Q11, Q17

Introduction

With one of the largest rural-urban income gaps in Asia (Yang and Zhou, 1996), China has attached great importance to narrowing the difference. Since the late 1970's, farmers' incomes have remained at less than one-half of that of city residents (except for a short period during the mid-1980's). In the early 21st century, the ratio of urban-rural per capita incomes reached about 3:1 (see figure 1.1). The underlying factors behind this rather large income gap and possible solutions is one of the most important public policy issues currently facing China's leaders.

There have been various explanations offered for China's huge income differences between rural and urban residents, one of which is the "price-scissor" theory, describing the growing upward trend of industrial prices relative to agricultural prices–in the shape of an open scissor. It is generally believed that

[*] Support from Natural Science Foundation of China (project No. 70573049 and 70873061) and NCET Program (NECT-07-0443) is greatly acknowledged.

controlled economies like the former Soviet Union and China employed the scissors pricing strategy in the early development stages in order to accumulate resources for industrialization and economic growth, at the cost of rural producers' welfare (Lardy 1983; Sah and Stiglitz 1984; Riskin 1987; Zhao and Wiemer 1991; Sheng 1993; Knight 1995). The price scissors is still believed by many to exist today, the implication being that the price of agricultural products in China has been in a declining trend over the past few decades, while that of industrial goods has been rising, leading to an enlarging scissors-shaped gap (see Shu 1997; Huang 1996; Yang, 2005). As such, some have argued that price supports for agricultural products should be utilized as an effective policy measure to increase farmers' income and economic welfare. With China's accession to the WTO and its domestic market gradually opened to the outside world, concerns arose that trade openness will lead to a further price drop in the price of agricultural products relative to industrial goods.

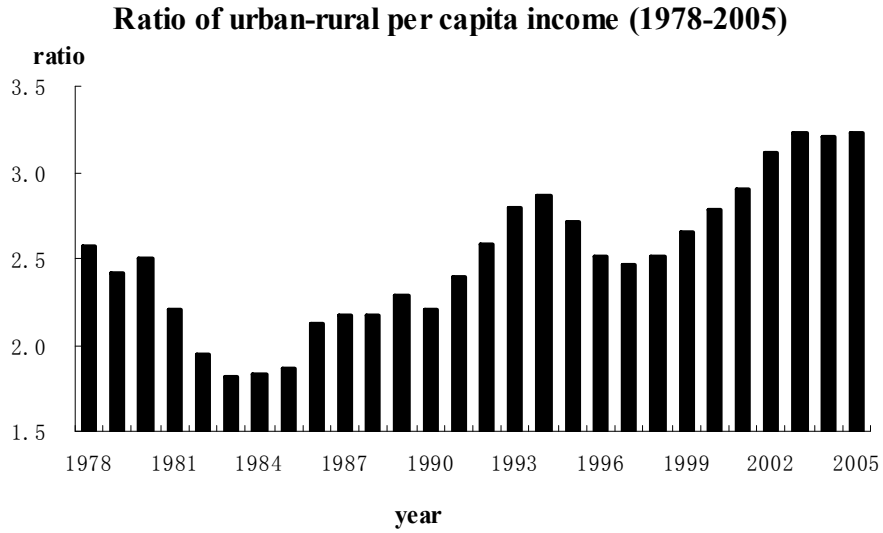

Figure 1.1. Ratio of urban-rural per capita incomes in China: 1978 to 2005

Source: Calculated from data in *Compilation of Statistic Data of New China for 50 Years*, and *Chinese Statistic Yearbook*, various years.

A few concerns need to be addressed in more detail before we can accept the above proposition. The first regards the relationship between agricultural prices and farmers' economic welfare. While farm producers' welfare is definitely affected by the price level of agricultural goods, which is the major source of their income, it is also affected by the price of industrial products, which constitutes a major part of their consumption. Therefore, the real purchasing power of the farmers is, in fact, determined more by the relative price level of agricultural products in relation to industrial goods, than nominal agricultural prices. As such, it is the terms of trade between agricultural and industrial products that affects the purchasing power and welfare of farm producers, and should therefore, be the focus of our concern when estimating the impact of trade liberalization on agricultural prices and farmers'

economic welfare.

Secondly, the issue of China's openness and its impact on domestic agricultural price levels need to be carefully studied. As mentioned above, holding other factors constant, it is the relative price of agricultural products–the domestic terms of trade–that determines the real purchasing power and economic welfare of farmers. China's accession to the WTO officially initiated the country's integration into the world economy. Both the agricultural and industrial sectors are becoming more and more open, but the overall effect on the relative price level of the two categories of products, the domestic terms of trade, still remains an unanswered empirical question.

In this paper, we have taken an initial step to try to address the above issues empirically. Using data for the past two to three decades, we analyze the domestic terms of trade between agricultural and industrial products and to estimate the impact of trade openness on the domestic terms of trade between agricultural and industrial products.

The paper is arranged as follows: we begin our analysis with a discussion of the terms of trade as one of the indicators for farmers' welfare. After introducing the methodology used in this study, we then analyze the development of the terms of trade for the past 28 years in China, to see if there exists a trend working against agricultural products. We then estimate the impact of trade openness on the domestic terms of trade. Conclusions and policy implications are provided in the last section.

II.: Analytical framework and development of domestic terms of trade in China

Farm producers' economic welfare can be viewed from different perspectives. In economic terms, we could measure farmer's income or purchasing power as a proxy of their welfare, and one of the most important indicators affecting farmers' real purchasing power is the terms of trade between agricultural and industrial products. The relative price of agricultural versus industrial products is generally regarded as an important indicator of income distribution between agricultural and industrial producers. While an increase of the nominal price level in agricultural products leads to a rise in farmers' nominal income, the real purchasing power and welfare is also determined by the price level of other categories of goods–most importantly industrial products, as farmers are consumers of industrial goods as part of their daily consumption needs and production inputs. If the rise of agricultural product prices leads to inflation, the resulting rise in industrial product prices could lead to a decrease in real income and purchasing power of farm producers. Therefore, the term of trade between agricultural and industrial products is a key indicator in measuring farmers' economic welfare.

In order to analyze the impact of trade openness on farmers' income and economic welfare from the perspective of terms of trade, we must first gain a better

understanding of the composition of the terms of trade indicator.

A time series of the domestic terms-of-trade between agricultural and industrial products could be constructed by comparing the price change of agricultural products relative to that of industrial products（P^{A-I}）, by computing the ratio of the price index of agricultural products（$PINX_A$）to that of industrial ones（$PINX_I$）, i.e.,

$$P^{A-I} = \frac{PINX_A}{PINX_I}$$

When

$$P^{A-I} = \frac{PINX_A}{PINX_I} \succ 1,$$

this implies rising agricultural relative prices, i.e. a change of terms-of-trade in favor of agricultural products, and when

$$P^{A-I} = \frac{PINX_A}{PINX_I} \prec 1,$$

this implies decreasing agricultural relative prices, i.e., a change of terms-of-trade unfavorable to agriculture.

Using data from 1978 to 2005, we have derived the price index of agricultural and industrial products (the ratio of nominal prices of agricultural and industrial GDP to their respective constant prices of the base year), and present them in figure 2.1. The terms-of-trade between agricultural and industrial products is then derived and presented in figure 2.2.

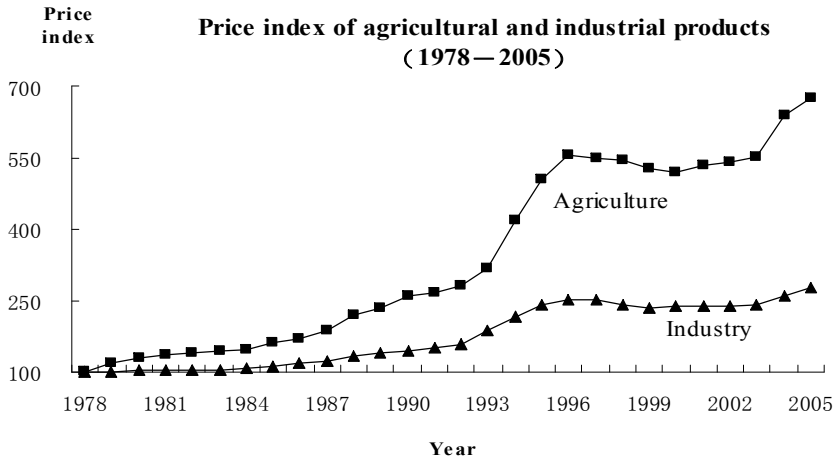

Figure 2.1. Price index of agricultural and industrial products, 1978－2005

Note：Price index year 1978=100

Source: ibid.

It can be seen from figure 2.1 that during the 1978-2005 time period, the price indexes of both agricultural and industrial products in China were rising. Taking 1978

as the base period (= 100), the industrial price index $PINX_I$ increased at the average annual rate of 3.8%, reaching 276.9 in 2005; and the agricultural price index, $PINX_A$, increased even faster, at an average annual rate of 7.3%, reaching 674.2 in 2005.

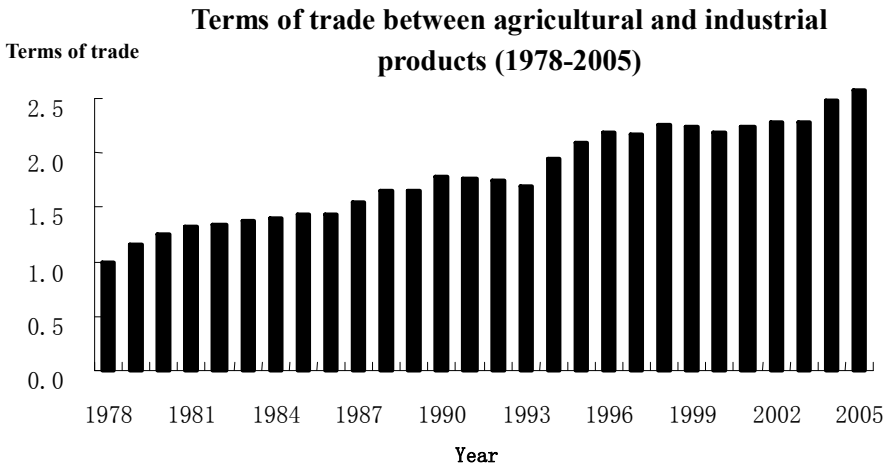

Figure 2.2. Relative price of agricultural versus industrial products, 1978－2005.
Note and source: ibid.

From figure 2.2 it is clear that over the past 28 years the relative price of agricultural versus industrial products, the terms-of-trade, has exhibited a rising trend in favor of agricultural products. Taking 1978 as the base period, the terms-of-trade increased by 2.5 times up until the 21st century, which indicates that the terms-of-trade has not moved against agricultural products, as has been generally assumed, rather, it developed in favor of agricultural products[1]. In the light of this, the proposition of an unfavorable terms-of-trade against agriculture as a major course of the increasing urban-rural income gap is inconsistent with the facts[2].

In the next section, we further study whether changes in the domestic terms-of-trade are affected by trade openness, and, if so, whether the movement is in favor or against agriculture.

[1] Li and Tsui (1990), using the ratio of agricultural to industrial prices as one of their independent variables in an econometric analysis to explain real capital formation per worker in industry in China, have found the unexpected result of a significantly positive coefficient and also noted the falling of the industrial price index during the sample period of 1952-1982. Similar observations are made in Knight (1995) and Wiemer and Zhao (1990), up to 1988, with different methodologies.

[2] Other factors contributed to the increasing urban-rural income gap should be considered with more attention, such as the increasing gap of urban-rural productivity, low mobility of rural agricultural laborers, and the huge difference between urban and rural areas in social welfare such as education, health care, social safety net, etc.

III.: Model, data and results

The domestic terms-of-trade between agricultural and industrial products is the ratio of price levels of the two categories of products. In a closed economy, it is mainly determined by the domestic relative supply and demand of the two categories of products, and in an open economy, also by the relative imports and exports of the two products. While it is well understood that trade policy will affect domestic relative prices, there has been calls for *"much more"* theoretical and empirical work to investigate the direction and magnitude of those interventions (Fletcher, 1968). And there are few empirical studies in this area that we could draw from.

One of the most innovative approaches for linking domestic prices with trade is suggested by Lewis (1968), using "implicit exchange rates", defined as the ratio between domestic prices in local currency and international prices in foreign currency. Weighting the implicit exchange rate (P_k for agricultural commodities and P_i for industrial goods) by marketings of the agricultural sector, M_k, and the purchases of industrial goods by the agricultural sector, E_i, and taking the ratio of the average implicit exchange rate for agricultural goods,

$$\sum_k P_{,} M_k$$

to the average rate for industrial products,

$$\sum_i P_{i,} E_i$$

gives the ratio of agriculture's domestic terms-of-trade to the terms-of-trade it would have in competitive equilibrium without trade restrictions. Lewis applied this method to Pakistan for the period of mid 1950s and 1960s, and found that agriculture received more than one-third less per unit of output exchanged than it might under "free-trade".

Other methodologies include the pass-through approach and the "Armington assumption" approach. The former technique has mostly been applied in evaluations of exchange rate transmission to domestic price levels (Campa and Goldberg, 2005; Campa and Glodberg, 2006; Parsons and Sato, 2008; Mallick and Marques, 2008), and the latter has been typically used in applied general equilibrium models (Dixon et al.1982). In addition, there have been recent studies linking the two above approaches, applied in the context of studying import prices relative to domestic prices (Warr, 2008), taking the form of

$$p_d = H_m p_m + H_o p_0$$

where p_m and p_d denote respectively the proportional changes in consumer prices of imported and domestically produced goods, p_0 the proportional change in an index of other prices, H_m and H_0 the elasticities of the domestic prices of the good with respect to the import price and other prices, respectively; and with

$$H_m = S_m(\sigma + \eta^D)/(\xi_d^s + \sigma S_m - \eta^D S_d)$$

where S_d and S_m denote the share in expenditure in domestic produced and imported

version of goods, with $S_d + S_m = 1$; σ denotes the Armington elasticity of substitution between the imported and domestically produced good; η^D is the elasticity of demand for the goods with respect to its own price; and ξ_d^S is the elasticity of supply of domestically produced good with respect to its own price.

It is important to note that both of the above mentioned approaches require explicit data on foreign and world markets. Most empirical research using this framework focuses on a particular commodity or an aggregate group of commodities for which there is an aggregate price index. Given the complexity of the various industries involved in trade and the structural changes in agricultural and manufactured goods during the 1978-2005 period, deriving the appropriate foreign market price index for the counterpart domestic commodity would be subject to large potential imprecision. Instead, rather than explicitly including the world market price in the model, the extent of trade openness, which captures both the "transmissibility" and the dynamics of price differences between the two markets, are built into the model. We recognize the inability of this approach to disentangle the effect of transmission from that of price difference upon the change of domestic agricultural relative price facing trade openness. But we also note it may not be absolutely necessary to disentangle these factors for our purposes. The sign of the coefficient will be determined by the price difference between the two markets, and the magnitude of the coefficient will be determined by both the difference effect and the transmission effect[3].

In this study, our model takes the following form:

$$P_t^{A-I} = \alpha + \beta GDP_t^{I-A} + \varphi TRADE_t + \eta P_{t-1}^{A-I} + \mu$$

Whereas P_t^{A-I} stands for relative price of agricultural products versus that of industrial, i.e. domestic terms-of-trade; GDP_t^{I-A} stands for the ratio of industrial GDP to agricultural GDP; $TRADE_t$ stands for trade dependence; P_{t-1}^{A-I} stands for domestic terms-of-trade of the previous year; with μ the error term and t the year.

GDP_t^{I-A} is the relative production level of industrial products versus that of agricultural markets. In a market economy, the price level is mainly determined by supply and demand; while in a planed economy the price level is largely controlled by the central planner. China has been transiting from a planed to a market economy

[3] In future work detailed techniques to decompose the two effects could be employed to address other specific issues. For the time being, we will use trade openness for our estimation as we are primarily interested in the question of whether openness is in favor of or against the domestic agricultural terms-of-trade giving the existing price difference during the study period.

since its open door policy in the late 1970's and early 1980's. Domestic prices of agricultural and industrial products have been gradually reflecting supply and demand. In this study, we choose GDP_t^{I-A}, the ratio of industrial GDP to agricultural GDP, as one of the major factors contributing to the level of domestic terms-of-trade, as it reflects the relative supply level of the two categories of products, and in the long run, also reflects the response to domestic and foreign demand[4]. Special attention has been paid to the relatively inflexible and longer production cycle in agriculture, and 1 year time lag is used for agricultural GDP.

$TRADE_t$ is taken to represent trade dependence, the ratio of imports and exports to GDP. It reflects the impact of the international market on domestic supply and demand through trade openness. In this study, three indexes of trade openness–the overall trade dependence ratio ($TRADE_t$), the agricultural trade dependence ratio for ($TRADE_t^A$), and the industrial trade dependence ratio ($TRADE_t^I$)–are estimated separately in model ①, model ② and model ③. The alternative indexes are used in order to test the robustness of the results regarding the trade impact, as well as to provide a more in-depth examination on the effect of trade openness on domestic terms-of-trade,

P_{t-1}^{A-I}, domestic terms-of-trade in the previous year, is another important factor affecting the current year's dependent variable, because of the inflexibility of price changes during short periods of time. Due to the asymmetry of information among producers and consumers, as well as various constraints affecting the timely reallocation of resources, the new price equilibrium may not be reached immediately. Price levels in the past period will still have an impact on the establishment of current prices.

It is anticipated that η, the sign for coefficient of domestic terms-of-trade for the previous year, P_{t-1}^{A-I}, should be positive, as it exerts a direct impact on the relative price level of the following year. Similar expectations apply to β, the coefficient for the relative GDP of industrial products to that of agricultural, since holding other conditions constant, the rise of supply of industrial products relative to agricultural

[4] Direct measurement of relative demand level of the two categories of products is not empirically feasible, and may lead to lower reliability of the result in this study. For example, the utilization of Engle coefficient to represent the relative demand between industrial and agricultural products has at least two technical problems-- the decomposition of processed products and industrial inputs from agricultural products, and likewise, the agricultural inputs from industrial products. Unfortunately data for these compositions are not available from input-output tables published. Incautious handling of the problems will result in manipulation of data and results.

products should push up the relative price of agriculture. The trade openness effect on domestic terms-of-trade is the emphasis of this study. If φ, the coefficient for trade openness, is positive in sign, the impact of trade openness on domestic terms-of-trade is favorable for agricultural products, and vise versa.

Using data from China Statistical Yearbook from year 1978 to 2005, we have estimated the above the model and the result are in presented in Table 1.

Table 1. Estimates for domestic terms-of-trade（1978-2005）

P_t^{A-I}	Model ①	Model ②	Model ③
Constant	24.568 （2.780）**	41.377 (3.141)**	33.451 （3.612）**
GDP_t^{I-A}	0.022 （0. 601）	0.077 (1.798)*	0.111 （3.302）**
$TRADE_t$	39.676 （1.728）*		
$TRADE_t^A$		-49.119 (-1.361)	
$TRADE_t^I$		39.071 (2.196)**	
$TRADE_t^{I-A}$			9.531 （2.176）**
P_{t-1}^{A-I}	0.787 （9.429）**	0.646 (5.521)**	0.585 （4.646）**
Adjusted R^2	0.977 F=377.7 D=1.888	0.977 F=294.2 D=1.633	0.978 F=402.6 D=1.637

Note：Figures in parentheses are t values. * and ** stands for statistical significance at the level of 10% and 5%, respectively.

It can be seen from the estimation results that all three models exhibit high goodness of fit, as well as homogeneity of estimated results. The coefficient for the terms-of-trade for the previous year, P_t^{A-I}, is positive as expected. Similarly, the coefficient for GDP_t^{I-A} is also positive, and is statistically significant at the 5% and 10% level in models ② and model ③, respectively. It should be noted from the results that overall trade openness has a positive impact on the domestic terms-of-trade in favor of agricultural products. From the results of model ② we can see that, compared to the insignificant agricultural trade dependence coefficient on domestic terms-of-trade, the impact of industrial trade dependence on the domestic terms-of-trade is statistically significant and positive in sign, which is reinforced by the results for model ③. It also shows in model ③ that the higher the ratio of trade

dependence of industrial products to that of agricultural, the higher the positive impact on domestic terms-of-trade in favor of agricultural products.

The results show that overall trade openness has in fact exhibited a positive impact on the terms-of-trade in favor of agricultural products. Compared with trade openness in the industrial sector, which shows a statistically significant positive influence, agricultural trade openness generates a negative yet statistically insignificant coefficient.

IV.: Conclusion and policy implications

The impact of trade openness on farmers' economic welfare has drawn attention before and after China's accession into the WTO. Some researchers have expressed concern that further trade openness will push down the price of domestic agricultural products and lead to a deterioration of farmers' economic welfare. In this study, we have taken an initial step towards empirically addressing the trade openness issue from the perspective of the domestic terms-of-trade. Using data for the past two to three decades, we have analyzed changes in the domestic terms-of-trade between agricultural and industrial goods, and the impact of trade openness the terms-of-trade.

We found that China's domestic agricultural-industrial terms-of-trade do not exhibit a decreasing trend over the past few decades, as assumed by many; and that trade openness has in fact exerted a positive impacts on the terms-of-trade in favor of agricultural products. This implies that trade openness has helped to improve the economic welfare of agricultural producers in China.

The preliminary results suggest that the domestic terms-of-trade between agricultural and industrial products, and the resultant economic welfare of the farm producers, are indeed influenced by the country's integration into to the world market, but not in a negative way. In fact, it is positively related to the country's trade openness. Compared with trade openness in agriculture, market integration in the industrial sector has a more significant impact on domestic terms-of-trade in favor of agricultural products. This could be attributed to faster technological progress and price transmission in the industrial sector. We conclude that the purchasing power and economic welfare of China's farmers has improved due to a favorable change in the domestic terms-of-trade brought by more open trade.

The result is of interest to both researchers and policy makers. China is a country with very wide rural-urban income disparity. Ways to increase farmers' purchasing power and improve their economic welfare has become a major policy concern. In the past, it was argued that a major reason for the large urban-rural income gap was the relatively low price of agricultural versus industrial products, and that price supports for agricultural products could be an effective policy tools to address this problem.

The results of this study will shed new light on the conventional assumption of the relationship between rural-urban price ratios and income differences, and will provide new agricultural policy ideas. With China's transition to a market economy, policy measures such as price supports, should be discouraged, as such instruments will stimulate over-supply, leading to price declines, not to mention the burden on the government's budget. What affects farmers' real economic welfare is their purchasing power, which it tied to the prices of agricultural goods relative to industrial goods. If agricultural price increases lead to inflation, then the net effect for farm producers might not always be positive.

With China's globalization and integration into the world economy, the result of this study helps to foster further discussions on the impact analysis of WTO accession on the domestic agricultural producers and the border measures taken.

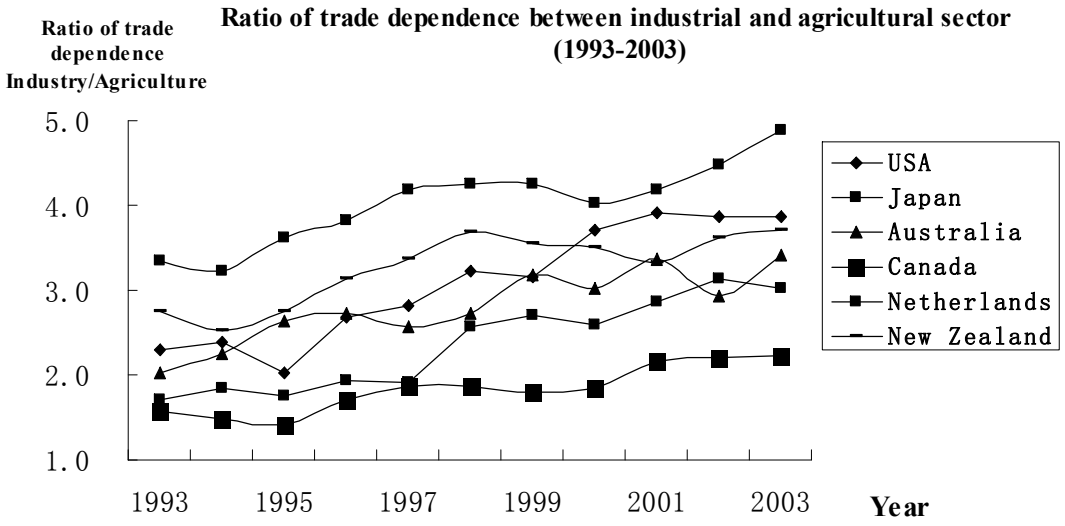

Figure 4.1 Ratio of trade dependence between industrial and agricultural, 1993－2003.

Source : Calculated from International Statistical Yearbook, various year, National Statistical Bureau of China.

The openness of trade impacts both the domestic agricultural and industrial sector. The results of this study show that, compared with agricultural products, domestic industrial products are affected to a greater extent by the lower price in the international market. The resultant domestic terms-of-trade are therefore moving towards a direction that is in favor of agricultural products. With nominal income constant, the purchasing power of farm producers could therefore be enhanced. As such, from the perspective of relative price of agricultural products, the overall openness, represented by WTO accession, is not to the disadvantage of farm producers. In the light of this finding, we believe that trade openness is not the cause to the urban-rural income problem; neither is trade curtailment a policy solution for narrowing the urban-rural income gap.

It is foreseeable that, with economic development and closer integration into the world economy, China's trade openness will continue to expand. Experience from other countries, such as the U.S., Japan, Australia, Canada, the Netherlands and New Zealand, etc., shows that the speed of openness in the industrial sector is usually higher compared to agriculture (see figure 4.1). The same trend is expected for China going forward. The analysis in this study shows that such a trade pattern will have a positive impact on the domestic terms-of-trade in favor of agricultural products, implying that greater overall trade openness will facilitate the relative price decrease of industrial products compared with agricultural products, and will help to improve the domestic terms-of-trade in favor of agricultural products, and improve farmers' purchasing power and economic welfare.

References

Anderson, K., W. Martin and E. Valenzuela. (2007). "Long Run Implications of WTO Accession for Agriculture in China". IATRC Conference on *China and the WTO*, Beijing, 9-10 July 2007.

Armington, P. (1969). A theory of demand for products distinguished by place of production. *IMF Staff Papers*, 16, 159-178.

Campa, J. and L.Goldberg. (2005). "Exchange Rate Pass Through into Import Prices". *Review of Economics and Statistics,* November, 87 (4): 679-690.

Campa, J. and Goldberg. (2006). "Pass-through of Exchange Rates to Consumption Prices: What Has Changed and Why?" Federal Reserve Bank of New York, Working Paper.

Dixon, P., Parmenter, B., Sutton, J. and vincent，D. (1982). *Orani: A Multisectoral Model of The Australian Economy,* North-Holland, Amsterdam.

Fletcher, L.B. (1968). "Pricing and Allocative Efficiency in Agricultural Development". *American Journal of Agricultural Economics.*Vol.50, No.5, Proceedings Issue, 1294-1306.

Gulbert, J.C. (2007). "Changes in Productivity and the Price Level in a Closed Economy". *Bulletin of Economic Research.* Vol. 8. Issue 2. 61-79.

Grilli, E. and M.C. Yang (1988). "Primary Commodity Prices, Manufactured Goods Prices, and the Terms of Trade of Developing Countries: What the Long Run Shows". *The World Bank Economic Review,* Vol.2, No.1. 1-47.

Hayami, Y. (2007). "An Emerging Agricultural Problem in High-Performing Asian Economies". *Policy Research Working Paper* 4312. The World Bank.

Hua Y. and etc. (2006). "The study of the problems concerning agriculture; rural areas and farmer from the angle of farmers*"* (Cong Nongmin Shijie Pouxi "Sannong" Wenti) , *Agricultural Economy (Nongye Jingji*). 2006(1)

Huang, Q. (1996). "Preliminary Analysis on Scissors-shaped Price Difference Between Industrial and Agricultural Products" (Gongnong Chanpin Jiandaocha Wenti Chutan). *Review of Economic Research (Jingji Yanjiu Cankao*), 1996(24).

Lardy, N. (1983) *Agriculture in China's Modern Economic Development,* Cambridge University Press, Cambridge.

Lewis, S.R. (1967). "Agricultural Taxation in a Developing Economy". *Agricultural Development and Economic Growth,* ed. H. M. Southworth and B.F. Johnston, Ithaca, N.Y., Cornell University Press, 453-492.

Lewis, S.R. (1968). "Effects of Trade Policy on Domestic Relative Prices: Pakistan, 1951-64", *The American Economic Review,* Vol. 58, No. 1. 60-78.

Li, D. and K. Tsui. (1990) "The generalized efficiency wage hypothesis and the scissors problems". *Canadian Journal of Economics.* XXIII. No. 1. 144-158.

Lopez, R.A. (2005). "Trade and Growth: Reconciling the Macroeconomic and Microeconomic Evidence". *Journal of Economic Surveys.* Vol. 19, No. 4. 623-648.

National Statistical Bureau of China. Various years. *Chinese Statistical Yearbook.*

National Statistical Bureau of China. Various years. *International Statistical Yearbook.*

National Statistical Bureau of China. 1999. *Compilation of Statistic Data of New China for 50 Years*.

Mallick, S. and H. Marques. (2008). "Exchange Rate Transmission into Industry-Level Export Prices: A Table of Two Policy Regimes in India". *IMF Staff Papers.*55(1):83-108.

Knight, J. (1995). "Price Scissors and Intersectoral Resource Transfers: Who Paid For Industrialization in China?" *Oxford Economic Papers* 47, 117-135.

Parsons, C.R. and K. Sato. (2008). "New Estimates of Exchange Rate Pass-Through in Japanese Exports". *International Journal of Finance and Economics.* April 2008; 13(2): 174-83.

Riskin, C. (1987). *China's Political Economy: The Quest for Development since 1949.* Oxford University Press, Oxford.

Sah, R. K. and J. Stiglitz. (1984). "The Economics of Price Scissors". *The American Economic Review,* Vol. 74, No. 1. 125-138.

Sheng, Y. (1993). *Intersectoral Resource Flows and China's Economic Development.* St. Martin's Press, New York.

Shu N. (1997). *Research Progress on Scissors-shaped Price Difference Between Industrial and Agricultural Products* (Gongnong Chanpin Jiandaocha Wenti Yanjiu De Jinzhan). *The World of Survey and Research (Diaoyan Shijie).*1997 (1)

Warr, P. (2008). "The Transmission of import prices to domestic prices: an application to Indonesia". *Applied Economics Letters,* 15, 499-503

Wen, G. J. (1993). "Total Factor Productivity Change in China's Farming Sector: 1952-1989". *Economic Development and Cultural Change,* Vol. 42, No. 1. 1-41.

Wiemer, C. and X. Zhao (1990). "Closing The Scissors Gap". *The Third International Conference on Sino-US Economic Cooperation.* Shanghai, China.

Yang, D. and H. Zhou. (1996). "Rural-Urban Disparity and Sectoral Labour Allocation in China", Research Papers in Asian Pacific Studies, Duke University, Durham, North Carolina.

Yang, Y (2005). "Research on the problem and countermeasures of the Price Scissors, preventing the farmers from reducing their loads and increasing their income" (Nongmin Jianfu Zengshou de Jiandaocha Zhangai Ji Duice), *Productivity Study (Shengchanli Yanjiu)*. 2005(1).