

The Implementation Path for China-Kyrgyzstan Free Trade in the Context of Asymmetric Interdependence: A Simulation Postprint Based on Partial Equilibrium Theory

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Abstract

Asymmetric interdependence is the norm in economic and trade cooperation between China and Kyrgyzstan. China-Kyrgyzstan free trade constitutes an important component of the Silk Road Economic Belt interconnectivity strategy and serves as a breakthrough point for China's westward free trade zone development process. This article employs a partial equilibrium model to simulate and analyze, at the BEC product level, the trade effects and domestic economic effects of the China-Kyrgyzstan free trade area under different tariff strategies. The study indicates that: under scenarios with identical tariff reduction magnitudes, the trade effects between China and Kyrgyzstan during 2002-2016 are positively correlated with their trade volume; tariff reductions have relatively significant impacts on trade effects, welfare effects, and tariff revenue losses for both China and Kyrgyzstan, particularly for China, and the impacts exhibit significant differences across different commodities, with industrial goods being the most pronounced; upon comprehensive consideration of trade effects and welfare effects, China's optimal strategy is to directly adopt zero tariffs, while Kyrgyzstan's is to gradually reduce tariffs.

Full Text

Preamble

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1. Introduction

The establishment of a free trade zone between China and Kyrgyzstan constitutes an important component of the Silk Road Economic Belt interconnection strategy and serves as a breakthrough point for China's westward promotion of free trade zone processes. The asymmetric interdependence between China and Kyrgyzstan represents the normal state of their economic and trade cooperation.

This study employs a partial equilibrium model to simulate the trade effects and domestic economic impacts under different tariff reduction scenarios. The SMART (Software for Market Analysis and Restrictions on Trade) model is utilized to analyze the trade creation effects, welfare improvements, and tariff revenue changes resulting from bilateral tariff reductions.

2. Model and Data

The simulation covers the period from 2002 to 2016, analyzing bilateral trade flows under various tariff reduction frameworks. The Broad Economic Categories (BEC) classification system is used to categorize products into:

1. **Primary industrial supplies** (BEC codes 111, 112, 121, 122)
2. **Processed industrial supplies** (BEC codes 21, 22)
3. **Capital goods** (BEC codes 41, 42)
4. **Consumer goods** (BEC codes 51, 52, 53)
5. **Transport equipment** (BEC codes 61, 62, 63)

The model calculates trade effects, welfare improvements, and tax effects for each category under different tariff reduction scenarios.

3. Simulation Results

3.1 Trade Effects from 2002-2016

Table 1 presents the simulated trade effects between China and Kyrgyzstan from tariff reductions between 2002 and 2016, measured in thousands of USD.

The results demonstrate that changes in trade effects during this period are fundamentally consistent with the growth in bilateral export volumes, indicating a positive correlation between trade effects and trade volume. Significant fluctuations in trade flows are observed, with particularly notable increases in trade creation effects after 2006.

3.2 Mutual Tariff Reduction in 2016

Table 2 details the trade effects, welfare improvements, and tax effects under a mutual tariff reduction scenario between China and Kyrgyzstan in 2016.

The simulation reveals that mutual tariff reduction generates substantial trade promotion effects for both countries, with significant variations across product categories. For China, processed industrial products (BEC 22) exhibit the most

pronounced trade promotion effects while also representing the most significant source of tariff revenue loss. Industrial finished goods (BEC 53) contribute most substantially to China's welfare improvement.

For Kyrgyzstan, primary industrial supplies (BEC 12) demonstrate the strongest trade promotion effects. Processed industrial products (BEC 22) are the most significant contributors to both welfare improvement and tax revenue losses for Kyrgyzstan.

3.3 Zero Tariff Scenario

Table 3 illustrates the effects under complete tariff elimination (zero tariff scenario) between the two countries in 2016.

The zero tariff scenario amplifies all effects observed in the partial reduction scenario, with trade volumes increasing substantially across all BEC categories. Welfare gains are correspondingly larger, though tariff revenue losses also increase significantly.

4. Analysis

The simulation results reveal several key findings:

First, trade promotion effects are asymmetric between the two countries, reflecting their different economic structures and comparative advantages. China's manufacturing base benefits from expanded exports of processed goods, while Kyrgyzstan's economy gains from increased trade in primary supplies.

Second, the magnitude of trade effects is directly proportional to the depth of tariff cuts. The analysis of different tariff reduction paths shows that a 25% reduction yields proportionally smaller effects compared to deeper reductions, with an approximately linear relationship within the observed range.

Third, the optimal strategy differs for each country. Given China's larger economy and greater competitiveness, its optimal approach would be to adopt zero tariffs directly. In contrast, Kyrgyzstan would benefit from a gradual tariff reduction schedule, allowing domestic industries time to adjust while still capturing welfare gains.

The partial equilibrium model demonstrates that successful free trade implementation requires finding a balanced approach that maintains Kyrgyzstan's enthusiasm for the free trade zone while maximizing mutual benefits. A phased reduction schedule, where China moves more aggressively toward zero tariffs while Kyrgyzstan implements gradual cuts, could achieve this balance.

5. Conclusion

Based on comprehensive analysis, China's optimal strategy is to directly adopt zero tariffs, while Kyrgyzstan should gradually reduce tariffs. This differenti-

ated approach accounts for the asymmetric interdependence between the two economies and maximizes the likelihood of successful free trade zone implementation.

The key to achieving free trade between China and Kyrgyzstan lies in balancing the interests of both sides to enhance Kyrgyzstan's enthusiasm for building a free trade zone. Processed industrial products are most important for China's trade promotion and also represent the most obvious tariff loss. Industrial finished goods are most significant for China's welfare improvement, while primary industrial supplies have the most significant impact on Kyrgyzstan's trade promotion.

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Abstract

Asymmetric interdependence represents the normal state of economic and trade cooperation between China and Kyrgyzstan. Free trade between the two nations constitutes an important part of the Silk Road Economic Belt interconnection strategy and serves as a breakthrough point for China's westward promotion of free trade zone processes. This paper employs a partial equilibrium model to simulate the trade effects and domestic economic impacts of China-Kyrgyzstan free trade zone under different tariff strategies from the perspective of BEC products.

The research shows that under the same scope of tariff cuts, the changes in trade effect between 2002 and 2016 in China and Kyrgyzstan are basically the same as the changes in the export trade of the two countries at that stage, which indicates that the trade effect is positively related to the trade volume. In 2016, the mutual reduction of tariffs between China and Kyrgyzstan has a significant impact on the trade effect, welfare improvement, and tariff loss of the two sides, and there are significant differences in the impact on different commodities, especially for China's trade promotion.

For China, the most important products for trade promotion are processed industrial products. These also represent the most obvious tariff loss to China. The most significant product for China's welfare improvement is industrial finished goods. Primary industrial supplies are the products that have the most significant impact on Kyrgyzstan's trade promotion. The most significant products for Kyrgyzstan's welfare improvement and tax losses are processed industrial products.

The key to achieving free trade between China and Kyrgyzstan is to find a balance between the two sides, so as to increase the enthusiasm of the Kyrgyz Republic to build a free trade zone. Based on comprehensive considerations, China's optimal strategy is to directly adopt zero tariffs, while Kyrgyzstan should gradually reduce tariffs.

Keywords: asymmetric interdependence; China-Kyrgyzstan free trade; partial equilibrium model; trade effect

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