The Effect of China's Real Exchange Rate Appreciation in the Next Decade
— An Investigation of a Recursive Dynamic CGE Analysis

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Abstract

Although recent empirical studies indicate that the renminbi is undervalued, few people discuss how to adjust it effectively. The essential objective behind this paper is to explore the effect of the alternative adjustment of China's real exchange rate. Different with the previous simulation designs, this paper considers the formation mechanism of the real exchange rate. By assuming the same change of factor's price during different time periods and using the recursive dynamic computable general equilibrium model, the two different scenarios are simulated against the baseline, one is to adjust the macro-structural imbalance by decreasing the gross national saving rate in China and the other is to adjust the micro-structural imbalance by increasing the real wage rate of Chinese labor. It can be seen that, first, the external imbalance will be improved by both the internal structural adjustments in the long-term; second, the effect of macro-adjustment is more significant than the micro-adjustment; third, a real appreciation would be sufficient for China to improve its terms of trade and change the export-oriented model of development into demand-oriented model of development in the next decade.

Key Words: gross national saving rate, real wage

1. Introduction

China and the United States contributed greatly to the large global economic imbalance that emerged in the middle of the last decade. In 2012, the Sino–US trade deficit accounted for 315 billion USD, which is over 45% of the total US trade deficit and more than the sum of the US trade deficit with Canada (31.8 billion USD), Mexico (61.3 billion USD), Japan (76.3 billion USD), Germany (59.7 billion USD), South Korea (16.6 billion USD). Many analysts are concerned that the imbalances in China and the United States contribute to the global financial crisis. And many US policy makers have urged China to reduce its reliance on exports for its economic growth and to adopt incentive policies to promote domestic consumption. Central to this position is the belief that China should appreciate its currency and adopt a floating exchange rate system, which could boost its imports and have positive effects on the US economic recovery. Another opposing view considers that the renminbi appreciation will provide no significant assistance to solve the expanding US current account deficit and high unemployment rate. Current debates focus on the questions on whether the renminbi's links to the US dollar may have resulted in an undervaluation of the currency and the degree of the undervaluation. However, estimating the equilibrium exchange rate of a currency is a complicated matter. The difficulties are greatly compounded in the case of a developing country like China that

is undergoing substantial structural change. The renminbi's value will be inexorably linked to the ongoing structural reforms of the economy and will reflect the further opening of the domestic market to foreign goods and services. The discussions on the exchange rate attaining a particular level may be less productive than focusing on the structural adjustment, such as the internal adjustment of the macro national saving rate and the micro labor market distortions.

This paper contributes to the published literature on renminbi revaluation in three aspects. First, the current debates focus on the role of the exchange rate in rebalancing the Chinese economy. However, majority of the CGE models used are static in nature. The inability of CGE models to account for growth effects makes them inadequate for the medium-run analysis of the exchange rate's effects on economic policies. They exclude accumulation effects and do not enable the study of the transition path of the economy, in which short-run policy effects are likely to be different from those of the medium run. To overcome this limitation, we propose a recursive dynamic CGE model for exchange rate analysis. Second, the real exchange rate is defined as the relative price of tradable goods with respect to non-tradable goods and represents the degree of international competitiveness. In theory, the factor cost is the better index of a country's international degree of competitiveness (Edwards, 1989). We consider the market price of the primary factor as the proxy variable for the real exchange rate in this paper and determine whether the factor is an incentive for the change in exports and imports by reducing the internal imbalance. Third, unlike the previous research that concentrated on the effect of the renminbi appreciation in different degrees (Li et al., 2011), this paper compares the effective means to achieve real appreciation.

2. Results

The major insight from the modeling framework used in this study is that exchange rates matter. However, the ultimate effect of changes in the exchange rate depends critically on the underlying cause of the exchange rate change and the extent to which a change in the nominal exchange rate can persistently alter the underlying real exchange rate (McKibbin and Sachs, 1991).

As discussed earlier, before the price of the primary factor can be considered the proxy variable of the country's competitiveness, two different shocks are given in our recursive dynamic CGE model to increase the factor price of China: one is to decrease the gross national saving rate and the other is to increase the real wage rate of both unskilled and skilled labor. Figure 1 indicates that the price of the primary factor has similar change trends under the two different shocks.

Figure 1. The baseline and the two policy lines: change in the primary factor price
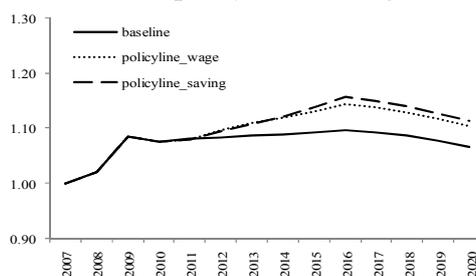
Source: Scenario results from GEMPACK version 10.0

Although the two scenarios produce a similar degree of appreciation, that is, the real of the factor cost increases approximately by 2.5% on average relative to the baseline during China's 12th Five-year Plan. However, the specific impacts of the macro- and micro- effects created by reducing the gross national saving and increasing the wage rate to manage China's external imbalance are not the same.

(1) The effect of the real renminbi appreciation on the Sino–US trade imbalance

The real exchange rate appreciation cannot reduce the Sino–US trade imbalance significantly in the short term (Figure 2). Compared with the shock by the gross saving rate, the correction of the factor market distortion plays a limited role in reducing the Sino–US imbalance. If the saving glut is indeed the cause, and the saving–investment gap is structural, China's imbalance will not disappear soon.

Figure 2 Percentage deviation of the policy lines from the baseline: trade imbalance
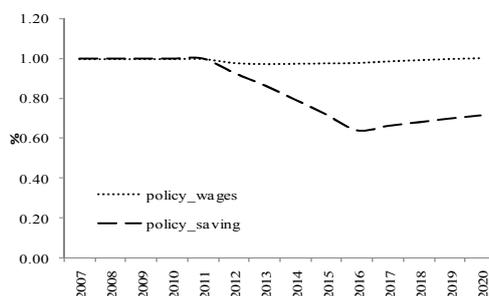
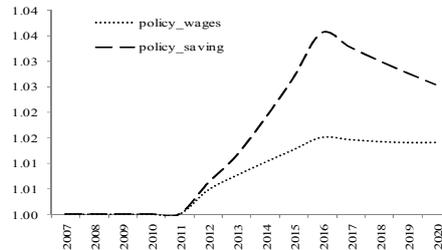Source: Scenario results from GEMPACK version 10.0

In the short run, the imbalance is mainly embodied in the trade structure. The fundamental factors of the two economies that determined the commodities of trade pattern during the 1980s can be explained by the concept of comparative advantage. However, in the late 1980s, a new pattern of the regional division of labor began to take shape. China's surplus coincided with the formation of international production networks, and its trade pattern was shaped by foreign direct investment (FDI). Although China's trade has expanded rapidly, the expansion is increasingly being dominated by processing trade. Unlike in general trade, appreciation will directly reduce the international competitiveness of a country. In the processing trade, the effects of a currency appreciation mainly depend on the extent of domestic and foreign contents in a country's trade. If the domestic content is low, the exchange rate appreciation will have a relatively small effect on exports because the higher foreign currency price of the export is partly offset by the lower domestic currency price of the imported inputs. The lower the content of domestic value-added embodied in exports, the lesser is the effect of the renminbi appreciation on export growth. Given the low level of domestic value-added share in a large proportion of China's exports compared with the world average, the appreciation of the renminbi may not have a significant effect on China's manufactured exports and employment in the short term, as many analysts anticipate.

(2) The Effect of a real renminbi appreciation on the terms of trade

Renminbi appreciation will improve China's terms of trade (Figure 3). An increase in the value of the yuan will decrease the domestic prices of China's imports but will not affect China's exports directly. Some exports produced in China will suffer from

export earning loss, but this trend will not be universal, especially for resource products and the processing industry with heavy multinationals involved. Moreover, renminbi appreciation will help to rebalance China's economic growth structure in two aspects. First, the appreciation helps China to rebalance from the reliance on exports to domestic demand in the long term. Second, the increase in the terms of trade enables the growth of the GDP.

Figure 3. Percentage deviation of the two policy lines from the baseline: terms of trade
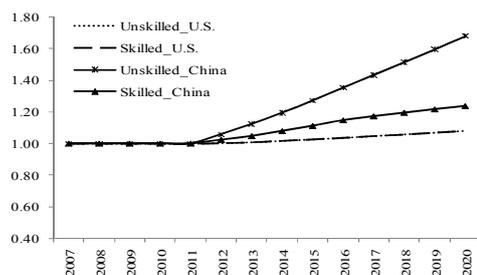

Source: Scenario results from GEMPACK version 10.0

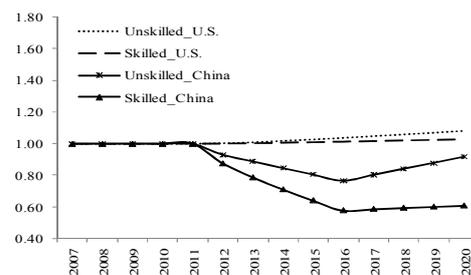*(3) The Effect of a real renminbi appreciation on the Sino–US labor market*

Figure 4 indicates the change in the Sino–US labor market under the two different shocks. According to the scenario results, in the case of China, the increase in factor cost caused by the wage increase will decrease the international competiveness of Chinese labor-intensive exports. Moreover, the foreign contract loss will reduce the domestic production and shrink the labor demand directly. The unskilled labor demand will decline approximately 15% based on average, and the effect of wage shock on skilled labor will be more significant. The scenario result indicates that the total employment will decrease to more than a third in the next decade. To maintain stability and the relatively rapid economic growth, China's 12th Five-year Plan emphasizes that the domestic demand should be allowed to play a greater role in fuelling economic growth. Expanding domestic demand is the basic requirement and the primary task of China to shift the economic growth mode in the next five years. This strategy utilizes domestic demand instead of the external market to simulate job creation. The effect of wage changes on China's labor market in the future may not be so significant in the short or medium term. Compared with the shock by wage, the saving rate adjustment has a positive effect on the Chinese labor market to increase investment and household consumption to promote the domestic product and labor demand in the long term.

Figure 4. Percentage deviation of the two policy lines from the baseline: labor market

(a) shock by the gross national saving rate   (b) shock by the real wage rate

Source: Scenario results from GEMPACK version 10.0

(4) The Effect of a real renminbi appreciation on the international market

Globalization not only boosts China's economic growth but also intensifies the linkage between China and the world. The renminbi adjustment will also affect the economy of other countries. Figure 5 indicates the changes in terms of trade of the different countries and regions relative to the baseline.

When the real exchange rate appreciates through the shock of the national saving rate in the next five years (Figure 5 (a)), China's terms of trade will improve because of higher export price and lower import price. The scenario results imply that the price of imported goods compared with that of exports will be larger for the United States, South Asian countries, the rest of East Asian countries, Brazil, India, Korea, Chinese Taipei, EU15, Japan, and so on. Aside from that of HK, the terms of trade of other countries will manifest the deterioration trend in the next decade. This assumption can be explained by the fact that, for industrialized countries such as the United States, EU15, Korea, and Japan, among others, the import of consumption goods with lower substitution from China will become more expensive and that the intermediated inputs exported to China by the multinational corporations of the developed countries will become cheaper. The terms of trade will decline in these countries. For developing countries, as FDI outflow from China to other countries increases, the structure of the global supply chain will also change. The Sino–US bilateral trade imbalance will decline in next decades, whereas China's surplus with other developing countries such as Vietnam, Malaysia, the Philippines, and other Asian less-developed countries will begin to increase. The US bilateral trade deficit with these countries may increase at the same time as the manufacturing and assembling activities move from China to these countries. Coming to the saving rate adjustment, the effect of real appreciation created by increasing the wage rate of China has a limited effect on the terms of trade of other countries (Figure5 (b)).

Figure 5 Percentage deviation of the two policy lines from the baseline: terms of trade

(a) shock by gross national saving rate   (b) shock by the real wage rate
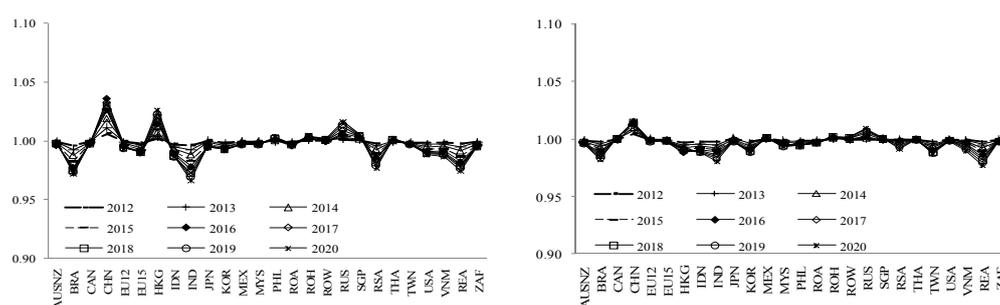
Source: Scenario results from GEMPACK version 10.0

3. Conclusions

By using a recursive dynamic CGE model to conduct a comprehensive assessment of the microeconomic aspect of the Sino–US trade imbalance, we find that, first, the Sino–US trade balance will continue to deteriorate to some extent for imported Chinese goods, as the United States is likely to be inelastic and the US trade deficit will not improve if the fundamental problem is not solved. Second, some contracts for labor-intensive products will transfer from China to other Asian developing countries

to take advantage of the lower labor cost. Third, the effects of currency appreciation depend on the extent of domestic and foreign contents in a country's trade. The lower the content of the domestic value-added embodied in exports, the lesser is the effect of the renminbi appreciation on export growth. Given the low-level domestic value-added share in China's exports, the appreciation of the renminbi may not have a significant effect as many analysts anticipate.

The Sino–US imbalance can also be explained by China's large, ongoing net saving surplus, which somehow has to be financed by lending to the United States. Some scholars believe that the Sino–US trade imbalance can only be corrected in the long term if China's net savings fall, similar to what happened to Japan in the 1970s and the Asian Tigers in the 1980s. Specifically, the savings rate of Japan reached its peak of 40.4% in 1970 and dropped to the lowest at 20.7% in 2009. Similar to the situation of Japan, Taiwan's savings rate dropped from 38.5% in 1987 to approximately 25% in 2010. This historical experience demonstrates that developing countries can easily have a higher savings rate during the process of catch-up and that the high savings rate can be maintained for some time before declining gradually. Compared with the real appreciation created by the wage rate increase, the decrease in gross national savings rate will help to rebalance China's trade account and improve the Chinese terms of trade in the next decade. However, in the short run, the imbalance is mainly embodied in the trade structure, especially in the bilateral trade of high-technology products between China and United States.

According to the recursive dynamic GGE model scenario result, the real exchange rate appreciation cannot reduce the Sino–US trade imbalance significantly in the short term. Compared with the shock by the macro-factor of gross national savings rate, the correction of the factor market distortion plays a limited role in reducing the Sino–US imbalance. If the savings glut is indeed the cause, and the saving–investment gap is structural, China's external imbalance will not disappear any time soon. The renminbi appreciation will not solve the fundamental problem of the Sino–US trade imbalance and create more job opportunities for the US labor market. China's large current account surplus is not only related to the value of Chinese currency but also to its industrial structure. To prevent a capital bubble and to ensure stable economic development, China should speed up the reform of the renminbi exchange rate formation mechanism and promote industrial upgrading.

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