

China's Accession to the WTO: Timing is Everything

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Abstract

Under the WTO's Uruguay Round Agreement on Textiles and Clothing (ATC), North America and Europe will be required to abolish the quotas currently levied against China. In the accession negotiations between China and the United States, the timetable for quota abolition was a subject of heated debate, with the United States arguing for a significant delay beyond 2005. In this paper, the effects of alternative target dates for the elimination of quotas under the ATC agreement, are examined. Since the issues revolve fundamentally around the question of timing, they are most appropriately addressed in a dynamic model. In this study we use the Dynamic GTAP model. In light of their respective stances on timing of ATC implementation, it is interesting to note that results suggest that slower implementation of the ATC agreement increases the expected gains to China. On the other hand such a delay is detrimental to North America and Europe.

1. Introduction

In 1986, China notified GATT/WTO members of its wish to resume membership in that organization. China's application to join the WTO has aroused a number of concerns from both developing and developed member nations. Some of the issues raised have included how China's growth and accession will affect the world food markets (Anderson, Dimaranan, Hertel and Martin, 1997); whether China's accession will further increase the U.S. trade deficit; whether increased competition will result in lower real wages for skilled and unskilled workers (Scott, 1999); and how increased competition will effect the development prospects of other nations in South Asia who compete in similar markets to China.

China's bid for WTO accession has involved negotiation of individual agreements with key WTO members. These bilateral agreements will then be extended to all WTO members upon accession. This long process of negotiation began in 1987. In November 1999, an agreement was reached between China and the United States, leaving the European Union as the major remaining obstacle to membership (Barry, 1999).

The main concern of WTO member states has been to secure greater access to the growing Chinese market. The issues addressed during these negotiations provide for further market access for foreign companies and foreign investment, the reduction of tariffs and the implementation of bindings, elimination of quantitative restrictions, and the participation of China in other multilateral agreements relating to information technology, telecommunications

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and financial services (USITC, 1999). In this paper, only the quantitative effects of tariff reductions and ATC implementation are examined ².

An important issue in the negotiations between China and the other member states has been the timing of China's accession, including: a) when China should join; b) whether China should be treated as a developed or a developing economy – hence dictating the timetable for tariff cuts; and c) when quotas on textiles and wearing apparel should be abolished by North America and Europe. Under the Uruguay Round (UR) agreement, developing countries are permitted a longer period of time during which to implement their agreements. In the case of China, the developed countries argue that the large size of the Chinese market justifies its being treated as a developed economy.

As China currently enjoys normal trading relations (NTR, previously MFN) status, WTO members are not required to further reduce their tariffs on Chinese goods. However, WTO membership would ensure China that these bound tariffs could not be increased in the future. In this paper, it is assumed that China will continue to enjoy NTR status even if it is not permitted to join the WTO. An important alternative scenario, where China loses its NTR status, is clearly a possibility. The Chinese government is obviously concerned about this alternative scenario, but we do not explore it here.

China is not a party to the Uruguay Round's ATC agreement. Upon accession to the WTO China will also become eligible for the benefits obtained under this agreement, namely the elimination of quotas on textiles and wearing apparel imported by North America and Europe from China. Elimination of these quotas, under the ATC, is likely to have a significant impact on the quota-constrained North American and European markets, as well as on the other developing economies which compete with China in these markets. This has led to concern by ATC importers, as well as competitor countries, about the effect of this on their own economies. Failure to remove the quotas on textiles and wearing apparel, however, would place China at a disadvantage in these markets. Yang (1996) has shown that the elimination of the quotas on textiles and clothing accounts for a significant proportion of the gains made by China and the United States from China's accession to the WTO.

In the agreement between the United States and China signed in November, China agreed to a delay in the implementation of the ATC by the United States (Gershman, 1999). The effects of this delay are examined in a third scenario presented in this paper. While there is also the distinct possibility of North America and Europe frustrating implementation of this agreement on all imports of textiles and wearing apparel (e.g. through the use of anti-dumping duties), this is not considered in this paper. The effect of the elimination of quotas on Chinese textiles and wearing apparel is also of great concern to other developing countries in this market who must compete with China.

China's WTO accession therefore involves both increasing access to Chinese markets through the reduction of trade barriers, as well as the removal of quotas on textiles by North America and Europe. Taiwan's liberalization is also included in this analysis as it is expected that once China's accession has been agreed upon, Taiwan's will automatically follow. While both the trade liberalization of China and Taiwan are included, the results focus on the effects of this liberalization on China.

² A qualitative assessment of the possible effects, on investment and trade, of these commitments undertaken in the accession agreement is provided in USITC (1999).

A number of studies (Yang, 1996, Wang, 1997a and 1997b, USITC, 1999, Martin et al., 1999 and Fan and Zheng, 2000) have been undertaken to examine the effects of China's accession to the WTO. In general, the results show that world trade increases substantially as a result of China's accession. The main winners from China's accession are China and Taiwan themselves. Wang (1997a) finds that North America and many of the other developed nations also gain as a result of increased exports, particularly of agricultural products. The removal of quotas under the ATC agreement appears to be a significant contributor to the benefits accruing to North America and China. Yang (1996) used the static GTAP model to examine the effects of differential timing of the accession. He concluded that there was little difference between whether China was treated as a developed or developing country for the purposes of accession. However, since this analysis was not conducted using a dynamic model, the differences in timing could not be implemented explicitly, thus making it difficult to distinguish between the alternative accession scenarios. In addition Yang (1996) did not examine the impact of a delay in the elimination of quotas under the ATC, which is the issue examined in this paper.

In this paper the dynamic GTAP model (Ianchovichina and McDougall, 1999) is used to more carefully examine the effects of timing on China and Taiwan's accession. The dynamic nature of the model makes it ideal for analyzing the effects of alternative timing scenarios. The effects of China's accession are examined over the period 1995 to 2020. This period is divided into a number of sub-periods, allowing the shocks to tariffs and to the quotas to be implemented in stages. In addition, the incorporation of international capital mobility in Dynamic GTAP allows us to examine the effect of China's accession on foreign investment and the accumulation of capital.

Two policy scenarios are considered. The first assumes that China and Taiwan are treated as developed countries and therefore tariffs are reduced over a period of 5 years. In the second, China and Taiwan are treated as developed countries, however North America and Europe do not completely remove the quotas on textiles and wearing apparel until 2010.

The results confirm the finding of earlier studies that China and Taiwan are expected to gain the most from China's accession to the WTO. North America and Europe also gain. Perhaps surprisingly, the delay of the ATC agreement by North America and Europe increases the expected gains to China from China's accession, while this delay is detrimental to the welfare of North America and Europe. This result -- which is a reflection of the quota rents enjoyed by China under the ATC, suggests that the political debate over the delayed implementation of the ATC is inconsistent with North America's national interests. Accordingly we also explore the sectoral adjustment required of the textile and apparel sectors in the ATC importer countries. Here, the benefits of delayed implementation are more apparent. We also consider the impact on developing countries which compete with China in the wearing apparel and manufacturing markets. These competitors suffer as a result of increased competition when China joins the WTO. The delayed implementation of the ATC agreement does little to improve this situation, from the perspective of the developing countries.

The paper is divided into six sections. Section 2 provides an overview of some key facts about China's role in the World economy. Section 3 then provides a brief review of the model and data used to examine the effects of China's accession. In section 4 the base case scenario and policy simulations undertaken in this paper are outlined. Then in sections 5 and 6 the results are examined. Section 5 concentrates on the aggregate results while section 6 examines the effect of China's accession on the wearing apparel and other labor intensive sectors. Section 7 then summarizes and concludes the paper.

2. China And The World Economy

Since the late 1970's the Chinese economy has undergone rapid changes. China's GDP has grown at a phenomenal rate. Between 1978 and 1995, per capita growth in real GDP averaged 6.04 percent (Maddison, 1998). In 1995 growth in real GDP exceeded 10 percent, and according to World Bank forecasts, (Global Economic Prospects Data Base, 1998) high growth rates are expected to continue to at least 2007.

Rapid growth has been fueled by a number of economic reforms undertaken by China since the early 1980's, including the reduction of tariffs as well as non-tariff measures, and the opening up of Chinese markets to foreign trade and investment. Between 1992 and 1998, tariffs have been reduced from an average of 42 percent to 17 percent (Fan and Zheng, 2000). These reforms have had a profound effect on trade. Exports and imports have been growing at an average rate of 22 percent per year since 1972 (Gelhar, 1998). This contrasts with the previous decade of the 60's when growth averaged 10 percent.

The Chinese economy has also shifted away from agriculture and into labor intensive manufactures. In 1952, agriculture accounted for approximately 58 percent of GDP, but by 1995 this figure had dropped to just over 23 percent. Likewise manufactures has risen from 8.1 percent of GDP to 41 percent over the same period (Maddison, 1998). The large endowment of labor in China has made labor intensive sectors, such as wearing apparel, important industries. However, competition in these labor-intensive markets has increased dramatically in recent years with the shift of other economies, notably South Asia, towards export-oriented strategies and production of labor intensive commodities.

Figure 1 reports the growth of foreign direct investment (FDI) in China from 1982 to 1998. In the early 1990's FDI sky-rocketed. By 1994, China accounted for 20 percent of all FDI in developing countries (Garbaccio, 1995). FDI continued to grow until 1997 when it leveled off. Figure 1 also reports the broader - and more volatile - foreign investment figures for China. These include portfolio investment. Here it is clear that China fell out of favor in 1998, under the shadow of the East Asian Crisis.

In its recent survey of China's economy, *The Economist* explores some of the reasons behind the slowdown in FDI in China. In many cases investor's high hopes for this market have been slow to materialize, with the absence of a rules-based economy making it difficult for outsiders to operate effectively in China. Informal relationships and corruption still hinder many business transactions by foreigners. In addition, inefficient state enterprises still dominate many key sectors of the economy. Quantitative analysis of these institutional problems is beyond the scope of this paper. However, we do explore the implications of WTO accession for market rates of return to investment in China. We find that accession can play an important role in enhancing China's attractiveness as a destination for foreign investment. The next section outlines the dynamic model which we use in our analysis. It places international mobility of capital at the forefront, thereby providing a useful vehicle for exploring the impact of China's WTO accession on foreign investment and economic growth in China.

3. The Model

The Dynamic GTAP model developed by Ianchovichina and McDougall (1999) is used to analyze the effects of China's accession. The dynamic GTAP model is a recursive-dynamic extension of the standard GTAP model (Hertel, 1997) which is a multi-region applied general equilibrium model. The dynamic model preserves all the special features of the standard GTAP,

while enhancing the investment theory to incorporate international capital mobility and ownership.

The model is applied to a 19-region by 22-sector aggregation of the version 4 GTAP data base (McDougall et al., 1998). The GTAP data base is supplemented with foreign income data from the IMF Balances of Payments statistics in order to track international capital mobility and foreign wealth.

In the remainder of this section some of the features of the dynamic GTAP model are discussed. Sub-section 1, outlines the investment theory of the dynamic GTAP model and sub-section 2, illustrates how foreign ownership of capital has been incorporated into the model.

3.1 Investment Theory

The dynamic GTAP model uses a disequilibrium approach for modeling international capital mobility. A disequilibrium approach is necessary in order to reconcile the theory of investment with observed reality. Economic theory states that saving is allocated across regions to those investments with the highest rate of return. With perfect capital mobility, rates of return must be equalized across regions. In the dynamic GTAP model, perfect capital mobility occurs only in the very long run. Investment is determined by the *gradual* movement of rates of return to equality across regions. This is the first use of the disequilibrium approach.

A corollary of the capital mobility theory is that if rates of return in a particular country are very low, investment will fall and vice versa. Implementation of this theory however leads to a dilemma. In many cases actual investment, as reported in the national statistics, does not correspond to that predicted by this theory. That is, observed rates of return are low but investment is high. This was the case in Southeast Asia prior to the financial crisis. Such discrepancies can be rectified in one of two ways: firstly, the data can be altered so that theory and data are consistent; or alternatively, the theory can be modified to more accurately reflect the world. In the dynamic GTAP model the latter method has been used. This has been achieved by incorporating errors in expectations about the actual rate of return. Thus investment is the result of the gradual movement of expected rates of return to equality across regions, but the expected rate of return may differ from the actual rate of return due to errors in expectations. This is the second use of the disequilibrium approach.

This disequilibrium approach is most appropriate in the case of foreign investment in China. Prior to the recent decline in foreign investment in 1998, foreign investment had been increasing dramatically (Figure 1), despite the fact that actual rates of return were relatively low during this period. This is an example of investors basing their investment decisions on expected rates of return, rather than on actual rates of return.

Determination of investment in the dynamic GTAP model may be illustrated with the help of Figure 2, taken from Ianchovichina and McDougall (1999). The two curves in Figure 2 show the expected and actual rate of return schedules. The expected rate of return schedule depicts the relationship between the expected rate of return (r_E) and capital stock (K), while the actual rate of return schedule shows the relationship between the actual rate of return (r_A) and capital stock (K). These curves are downward sloping reflecting the belief that, as capital stocks increase, rates of return will fall, *ceteris paribus*. The difference between these two schedules represents the errors in expectations (i.e. the difference between observed data and the postulated theory). In any given year, there is a *temporary equilibrium*, global rate of return, r_T , that ensures that global savings equal investment. This is depicted by the horizontal bar in Figure 2.

Investment in a particular year is determined by three mechanisms. The first is the desire to eliminate errors in expectations, which causes the expected rate of return to gradually move towards the actual rate of return. This involves the movement of the expected rate of return schedule towards the actual rate of return schedule (arrow 1 in Figure 2). In the case of China, the expected rate of return must rise to match the higher actual rates of return. Secondly gradual equalization across regions of rates of return requires the movement of the expected rate of return towards the temporary equilibrium (r_T) (labeled 2 in Figure 2). With higher expected rates of return (as experienced in China) investment and capital stocks increase as the expected rate of return moves towards r_T . The third mechanism is the equalization of the growth rates of capital over time, with all three rates of return converging on a long-run equilibrium rate of return, r^* .

In China expected rates of return rise towards the actual rate of return (assuming no unexpected shocks). At the same time China's actual and expected rates of return gradually fall towards the long run equilibrium rate of return. Rates of return in Western Europe and the other countries also move towards this long run equilibrium.

3.2 Ownership

With the incorporation of international capital mobility it becomes necessary, for purposes of examining the welfare effects of China's accession, to take account of foreign capital ownership. In the dynamic GTAP model, regional capital is owned by both domestic households and by foreign households via a global trust. The saving of each regional household is then allocated either to domestic investment or to foreign investment. This allocation assumes that the shares of domestic and foreign investments are held constant, subject to the adding-up constraints required to ensure regional saving and investment constraints. This is consistent with empirical evidence that investors tend to invest first in their home economies and then abroad.

Explicit modeling of the ownership of regional investment in China allows the accumulation of China's wealth by foreigners to be determined. In addition China's ownership of domestic and foreign assets can also be tracked. Income accruing from the ownership of these foreign and domestic assets can then be appropriately incorporated into total regional income, and hence welfare for both China and the rest of the world.

4. The Base Case and the Policy Scenarios

The timing of liberalization is an important factor in negotiations over China's WTO accession. A central purpose of this paper is to examine how the various timing issues proposed will affect the outcome of China accession. In this paper, the effects of China's accession offer are examined over the period 1995 to 2020. This time frame is divided into a number of unequal periods: 1995-1999³, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010-2014, 2015-2019. Three simulations are undertaken, one base case simulation and two alternative policy simulations. The base case scenario provides a picture of what we expect the world economy to look like without China's accession to the WTO, while the policy scenarios are used to examine the two alternative timetables for ATC implementation. The difference between the base case and a given policy simulation shows the effect of China's accession under that particular scenario. We now turn to a detailed discussion of each of these experiments.

³ Beginning of 1995 to the end of 1999.

4.1 The Base Case Scenario

To obtain the base case scenario, forecasts of key macroeconomic variables and any anticipated policy changes are required. Forecasts of the growth rates of gross domestic product, skilled labor, unskilled labor and population for each region were originally obtained from the World Bank (Global Economic Prospects Data Base, 1998), Ahuja and Filmer (1995) and CPB (1999). These were then extrapolated⁴ and adjusted to obtain yearly growth rates for the period 1995 to 2020. These forecasts were then aggregated to obtain the shocks for each of the periods and the 19 regions used in the simulation.

The base case scenario also includes some policy shocks which have already occurred, or which are expected to occur, during the period 1995 to 2020. These policy shocks include implementation of the Uruguay Round, including the Agreement on Textiles and Clothing. The UR shocks were calculated from post-UR tariff rates compiled by Francois and Strutt (1999). The reduction in tariffs as a result of the UR and the enlargement of quotas resulting from the ATC are assumed to occur over the period 1995 to 2005. A number of assumptions are required: firstly, it is assumed that China continues to be granted NTR status under this base case scenario. Therefore tariffs on goods imported from China are reduced in line with the UR commitments. Secondly, it is assumed that effective tariffs on agricultural commodities worldwide do not fall further during the period 1995 to 2005 regardless of any UR commitments⁵. Thirdly the elimination of quotas on WTO exporters of textiles and clothing under the ATC are incorporated into the simulation as reductions in export tax equivalents obtained from the GTAP data base. These export tax equivalents are essentially the rents earned from the quotas. These rents have been reduced gradually over the period 1995 to 2004 to simulate the effects of gradual elimination of the quotas. As these quota liberalization commitments have been heavily back-loaded, the shocks are implemented as follows: only 1 percent of the initial quotas are eliminated in each of the first five years, then 2, 8, 16, 32, 37 percent are eliminated in each of the remaining five years. So that by the year 2000 quotas have been eliminated by 5 percent, 2001 by 7 percent, 2002 by 15 percent and so on. This time path for liberalization of textiles and apparel quotas is shown in Figure 3 (Base Case -- coincides with CHN2005 after 2000).

In addition to the usual UR and ATC shocks, the base case also takes into account some of the trade liberalization undertaken by China prior to the year 2000. China has already made significant progress towards reducing tariffs. Failure to include these reforms in the base case scenario could lead to an overestimation of the effects of China's accession⁶. Estimates of these tariff cuts were calculated from 1996 and 1998 tariff rates obtained from Fan and Zheng (2000)⁷.

⁴ Extrapolation leads to a growth rate for China of approximately 7 percent per year in the years (2008-2020). Maddison (1998) estimates the growth rate between 1995 and 2015 at 4.5 percent per year, suggesting that 7 percent may be an overestimation.

⁵ This decision was taken based on the belief that actual tariff rates are already believed to be below those being implemented in the UR owing to dirty tariffication.

⁶ Using the dynamic GTAP model it was found that the cumulative difference in real GDP, resulting from China's accession, was approximately 1 percentage point higher if these pre-accession tariff cuts were not taken into account.

⁷ The shocks were obtained by calculating the percentage change in tariff rates between 1996 and 1998 rates and then applying these cuts to the GTAP rates in the base case scenario over the period 1995 to 2000.

Technological change in the base case is calibrated using forecasts for real GDP. An initial simulation is undertaken in which all the macro variables, including real GDP, and the policy changes listed above are shocked by the amounts forecasted. In this simulation technology is permitted to respond endogenously to ensure that real GDP tracks the forecast. The resulting values for the technological change variable provide an estimate of how technology is expected to change over the period, if these forecasts for real GDP are to be achieved. Having obtained these values, the base case scenario is again simulated with real GDP determined endogenously and technology exogenously shocked by the value determined in the first simulation. The purpose of this calibration procedure is to ensure that GDP increases as predicted, and to establish a baseline for subsequent comparison with policy scenarios where in GDP responds to China's WTO accession. These shocks are region-specific shocks to technology, which relate to non-accumulable resources. Further details on the base case scenario and the procedures used to obtain these shocks are available in Walmsley and McDougall (2000).

4.2 The Policy Scenarios

In this paper two alternative policy scenarios are examined. Each of these involves implementing all the shocks from the base case scenario plus the policy simulation. In all policy scenario's China accession is assumed to commence in 2000. The examination of the results, in section 5, will therefore concentrate on the period 2000 to 2019.

1. **CHN2005:** The first policy scenario involves China being treated as a developed economy. Therefore tariffs cuts are expected to be accomplished by the beginning of 2005. In this scenario, we also assume the quotas on China's textiles and clothing, exports to North America and Europe will be removed by the beginning of 2005. Quotas are assumed to be eliminated at a rate of 7, 8, 16, 32 and 37 percent over the five year period 2000 to 2005 (CHN2005 in Figure 3 - overlaps the Base Case from 2000 onwards). This scenario is referred to as CHN2005.
2. **ATC2010** In the second scenario, North America and the EU drag their feet on removing the quotas on textiles and clothing levied against China. Thus quotas are not completely removed until the beginning of 2010. Quotas are assumed to be eliminated at the rate of 1 percent for the first 5 years and then 2, 8, 16, 32, 37 percent each year after that (line labeled ATC2010 in Figure 3). The difference between CHN2005 and ATC2010 is shown in Figure 3 as the difference between the two lines CHN2005 and ATC2010. China is assumed to reduce its tariffs by the beginning of 2005, as in CHN2005. This scenario is referred to as ATC2010. The agreement reached between China and the United States, in November 1999, suggests that it is this scenario which is most likely to occur.

China's accession offer was obtained from Martin et al. (1999) and is based on China's offer as of August, 1999. This offer is compared to their original tariffs for 1997, and where the binding is lower, the offer is taken as a change in policy. In the case of Taiwan, the cuts are based on their announced target of 4 percent average tariffs for manufactures. Tariffs on agriculture are assumed to be reduced by China in accordance with the accession offer, however no data were available on Taiwan's offer for agriculture and therefore no shocks could be applied. In all three scenarios, the reduction in tariffs is assumed to occur in equal installments over the entire period. The elimination of quotas under the ATC occur at the rates given in Figure 3 above. This reflects the fact that quotas are expected to be eliminated at certain pre-

specified rates which increase over the agreed period, thus the effects are likely to be felt primarily towards the end of the implementation period.

5. Aggregate Results

5.1. The Base Case Scenario

In the base case scenario capital stocks and the ownership of these capital stocks are determined endogenously within the model; their resulting value depending on the investment mechanism described above. High rates of return in China are driven towards the long run equilibrium rate of return by increasing investment and capital stocks. The level of China's capital owned by foreigners increases initially and then declines gradually over time (Figure 4: Base case). This downward trend in foreign capital concords with the current downward trend seen in foreign investment (Figure 1), albeit with a slight delay. This predicted downward trend in foreign ownership of capital (Figure 4) is based on 1995 data and therefore does not include the recent Asian crisis which may have precipitated the actual decline in foreign ownership seen in Figure 1.

5.2. Policy Scenario 1: China is treated as a developed country (CHN2005)

In this scenario, China is treated as a developed country and North America and the EU accelerate the quotas on textiles and wearing apparel imported from China, leading to their abolition by 2005. A summary of the results of the impact of China's accession on all the economies is given in Table 1 below. The results report the cumulative differences between the base case and policy scenario at the beginning of 2020, thus highlighting the long-run effects of China's accession.

As a result of China's trade liberalization efforts the price of capital goods declines (CHN2005: Figure 5) and rental prices rise, leading to higher rates of return relative to the base case (CHN2005: Figure 6). Investment and hence capital stocks (8.1 percent in Table 1) increase relative to the base case scenario as a result of the higher rates of return available in China, particularly in the first five years following China's accession. Capital moves into China and Taiwan. The owners of this capital tend to be first and foremost the residents of China, followed by competitor economies, where the rate of return has fallen as a consequence of China's WTO accession. Overall foreign ownership of China's capital increases relative to the base case (CHN2005 relative to Base Case in Figure 4) as a result of China's accession.

Figure 7 depicts the cumulative percentage differences from the base case of China's real GDP. Real GDP is higher after China's accession to the WTO and the difference between the base case and policy scenario increases over time, reaching 8.7 percent by 2020. The increase in 2020 real GDP in China is 8.7 percent (Table 1). This derives largely from the increase in capital stocks (8.1 percent in Table 1).

From Table 1, we see that China and Taiwan are the biggest winners from accession in terms of both real GDP (production measure) and welfare (consumption measure). North America, the European Union, Japan and the newly industrialized economies also gain in terms of real GDP and welfare as a result of China's accession. However, in the case of China's competitors, such as the economies in Southeast Asia and South Asia, both real GDP and welfare

fall. The welfare figures provided in Table 2 represent the accumulation, over time, of the present values of the changes in regional welfare due to China's accession (CHN2005); where the actual regional rate of return, obtained during the simulation, is used to discount annual welfare.

As expected, the terms of trade decline by 3.8 percent for China as the price of increased exports falls, relative to the price of imports. In the other countries the terms of trade improve, reflecting the increased demand for their products in China. In Taiwan the terms of trade also improve slightly, suggesting that China's accession has a greater effect on Taiwan's terms of trade than does its own liberalization efforts.

Real wages increase in China over the period 2000 to 2009 and then decline. Overall, China's wages for skilled and unskilled workers are higher in 2020 as a consequence of accession (2.5 and 3.2 percent respectively). The increase in competition from China reduces real wages elsewhere, particularly those competing in similar markets to China. In the OECD countries, real wages also decline, although only slightly.

World exports in 2020 are increased by approximately 4 percent due to China's WTO accession. While China's exports increase substantially, so do imports. In North America, both imports and exports increase, however imports, driven by abolition of the textile and apparel quotas, increase by more. Most of this increase in trade occurs over the period 2000 to 2004. China's competitors in the wearing apparel market (India, South Asia and Indonesia) experience an overall decline in exports, while the other newly industrializing economies, Taiwan and Japan increase their exports of more capital intensive products to China, including textiles and electronics.

5.3. Scenario 2: North America and Europe drag their feet on implementing ATC (ATC2010)

In this scenario, China is again treated as a developed country and must reduce its tariffs over the period 2000 to 2004. North America and the EU, however, prevail in their desire to delay removal of quotas on textiles and wearing apparel, which are not completely eliminated until the beginning of 2010. The results of this scenario are summarized in Table 1.

Comparison of these results with those obtained in scenario 1 (Table 1) reveals that the results are not as initially expected. In the scenario examined here, quotas on textiles and clothing are reduced gradually over 10 years, as such we might expect that China's real GDP would be less than if North America and Europe had eliminated quotas more quickly. However this is not the case. To understand why we need to examine the drivers of investment.

Figure 5 shows the cumulative percentage differences, from base case, of the price of capital goods in China under the two alternative scenario. It is clear that the price of capital goods falls significantly more when the agreement on textiles and clothing is delayed (ATC2010). These further falls in the price of capital goods are due to an increase in China's production of other manufactures, induced by the continuation of quotas stifling production in China's wearing apparel sector.

As a result of the lower price of capital goods, rates of return under the ATC2010 scenario are almost as high as those obtained when the ATC is not delayed (Figure 6: CHN2005

and ATC2010). Moreover, larger falls in the price of capital goods in later years causes the rate of return to remain higher under the ATC2010 scenario. The higher rate of return on capital in those later years causes investment and capital stocks to continue to increase.

Overall, the increased accumulation of capital stocks in later years, causes both real GDP and welfare (Table 1) in China to be significantly higher, in the long run, when North America and Europe eliminate quotas on textiles and wearing apparel gradually over 10 years (Figure 7). However, not all of the other economies experience the same fall in price of capital goods as does China under this scenario, hence rates of return, capital stocks and real GDP do not rise. The reason for this is that capital goods in many of the other developed economies are not as reliant on cheap, labor-intensive manufactures and they are making no cuts to their own tariffs.

China's exports and imports increase significantly under this scenario (45 and 51 percent respectively). China's increased prosperity flows through to the Newly Industrialized economies via China's increased demand for capital intensive goods. Welfare increases in Japan and the Newly Industrialized economies. In North America real GDP and welfare fall slightly (relative to CHN2005) as a result of their own delay in extending the implementation of the ATC to China (Figure 8). Western Europe also experiences a reduced welfare gain.

Eliminating the quotas on Chinese textiles more slowly does appear to assist China's competitors, particularly those in South Asia. The reduced competition in the wearing apparel sector means that competitors can increase production of wearing apparel (Figure 12). At the same time however, increased production by China of other manufactures (Figure 13A) and electronics (Figure 14) means more competition in these sectors and reduced production by competitors (Figures 18). The long run effect on competitors depends on whether the increase in wearing apparel can offset the decline in other manufactures and electronics. In the case of India and South Asia where wearing apparel accounts for 11 percent of exports the delay results in a slightly higher real GDP (Figure 9). In Indonesia and other South East Asian economies however, other manufactures and electronics are more important and the delay is detrimental, but only after 2009.

The effect of the delay on foreign ownership of Chinese assets is shown in Figure 4. Foreign ownership increases as a result of China's accession to the WTO. This increase occurs more gradually when the ATC is delayed, although in the long run foreign ownership is greater than if the ATC had not been delayed (CHN2005). Again it is China's own competitors who increase their holdings of assets abroad most. This is because of the decline in their own rates of return.

6. Sectoral Results

The main motivation for slowing full implementation of the ATC in China are the anticipated sectoral adjustments in North America and Europe. As can be seen from Figure 11 employment in wearing apparel in North America is expected to continue its historical decline under the base case to only 50 percent of current levels in 2020. When China enters the ATC this trend is exacerbated so that employment ends up at a mere 25 percent of current levels by the year 2020. This implies substantial adjustments within the sector, and timing becomes key. How much of this adjustment must occur before 2005? Under CHN2005 most of the decline is sustained within the next 5 years – versus 10 years under ATC2010.

In the base case, employment in China's wearing apparel sector is fairly constant. With China's accession to the WTO and the removal of quotas (CHN2005) employment increases sharply during the period 2000-2004 (Figure 10). When the ATC is delayed (ATC2010) the increase in employment in China's wearing apparel sector occurs more gradually, not reaching the same levels as CHN2005 until 2010 (Figure 10).

China's competitors are also affected by the timing of the ATC as applied to China. Consider the case of India. Under the base case, employment is expected to boom in this industry – quadrupling by the time the quotas are eliminated (Figure 12). However with China's accession (CHN2005), growth is more gradual with only half of this increase occurring by 2020. ATC2010 changes this profile considerably, with rapid growth to 2005, followed by a flattening out and slight decline as we approach 2010 and elimination of China's quotas.

These strong swings in textiles and apparel employment have an impact on other sectors as well. In China, the shift from flat growth in employment in the wearing apparel sector to high growth under CHN2005, and medium growth under ATC2010 (Figure 10), draw labor away from other manufacturing activities. Figures 16B and 17 show the impact on other manufactures and electronics employment in China (cumulative percentage differences from base case). CHN2005 has a marked impact on employment. Employment in other manufacturing falls, relative to the base case, during the period 2000 to 2004, increasing again only once the quotas on wearing apparel have been completely removed.

When the elimination of quotas is delayed (ATC2010), production in other manufactures increases (Figure 13A). The expansion in the other manufactures sectors, as a result of the delay of ATC implementation, has the effect of increasing competition in these other manufacturing sectors and reducing prices. This reduction in the price of other manufactures is obtained at the expense of workers in South East Asia, India and Indonesia. In China, other manufactures account for 82 percent of imported inputs and 21 percent of domestic inputs into the capital goods sector. Domestic construction, which also relies on imported manufactured goods, accounts for 65 percent of domestic inputs into the capital goods sector. The combination of the fall in the price of other manufactures and of construction is the primary reason for the significant fall in the price of capital goods in China and hence the improved investment and real GDP results obtained under the ATC2010 scenario (Figure 5).

In the case of North America and the other developed countries, food and services tend to increase while manufacturing and in particular wearing apparel employment decline, this is consistent with other studies (Wang, 1997a). In India, increased competition in the wearing apparel sector, caused by China's accession, draws resources towards the other labor-intensive manufacturing sectors, such as electronics. Under CHN2005, employment in India's electronics sector increases by 50 percent over the period 2000 to 2005 (Figure 15). When the elimination of quotas on Chinese wearing apparel is delayed however, labor is moved to wearing apparel (Figure 12) and the increase of 50 percent in employment in India's electronics sector does not occur until 2010 (Figure 15).

These effects are also reflected in trade flows, with exports by China of wearing apparel increasing significantly, 215 percent by 2020 under both scenarios (CHN2005 and ATC2010). Chinese electronics and other manufactures increase further when the ATC is delayed (53 and 26 percent respectively under ATC2010 as compared to 16 and 41 percent under CHN2005). This is accordingly mirrored in other economies. India's exports of wearing apparel fall considerably

under CHN2005, however this fall is lower when the ATC is delayed. In the case of India's exports of electronics and other manufactures increase under both scenarios, although the increase is slightly less when the ATC is delayed.

In summary, the sectoral impacts of delaying the ATC are substantial and it is easy to see why the timing of China's accession has received so much political attention. In the case of North America and Western Europe it becomes a question of weighing the higher aggregate benefits from rapid liberalization against the higher sectoral adjustment costs.

7. Conclusion

The timing of trade liberalization has been an important focal point in China's WTO accession negotiations. There has been a great deal of debate over whether China should be treated as a developed or a developing country. In addition, the concerns of North America and Europe over the likely effects of China's accession on their economies have led them to examine the prospect of delaying the elimination of quotas on textiles and wearing apparel required under the accession agreement.

In this paper the issue of timing was considered explicitly using a dynamic applied general equilibrium model. Two scenarios were considered: the first assumed that China's tariffs would be reduced prior to 2005. In this scenario quotas levied by North America and Europe were assumed to be eliminated by the beginning of 2005. In the second scenario, North America and Europe delay removal of quotas on textiles and clothing to 2010, while China's tariffs are reduced by the beginning of 2005.

The results show that China and Taiwan are the primary beneficiaries of China's WTO accession, with large gains in welfare being obtained under both scenarios. Real GDP and welfare in North America and Europe increases the most when trade liberalization and the ATC agreement were completed by 2005. This confirms Yang's (1996) finding that the reduction in quotas under the ATC agreement is a significant contributor to North America's gains from China's accession. The newly industrialized economies experience slight improvements in real GDP as a result of China's accession. This was due to their role as a supplier of inputs into China's production.

The real GDP and welfare impacts on the developing economies in Southeast and South Asia, decline as a result of China's accession. This is the result of increased competition from China in the labor intensive markets. This competition was most clearly seen in the wearing apparel market. However it also has an effect on other markets, including electronics and other manufactures. While the delay of the elimination of textiles and wearing apparel quotas by North America and Europe does reduce competition in the wearing apparel market, it tends to intensify competition in the other (non-wearing apparel) labor-intensive sectors, such as other manufactures and electronics. Reduced competition in the wearing apparel sector assists China's competitors in South Asia, however, it is detrimental to those in Southeast Asia who compete with China in the other labor-intensive markets.

Foreign investment in China has declined in recent years. Therefore, it is of interest that China's accession to the WTO causes foreign investment to increase relative to the base case. This is the result of higher rates of return in China. These higher rates of return attract capital

flows from many of China's competitors who experience significant declines in their own country's rates of return as a result of China's accession.

Overall, the timing of policy changes effects the expected benefits of China's accession to the WTO and these conclusions are noteworthy in this regard.

First, the controversial debate over the delay of the full implementation of the Agreement on Textiles and Clothing has a significant effect on the benefits accruing to China from its accession. The results show that eliminating quotas more gradually, over 10 years, had the effect of reducing the price of capital goods and thus increasing capital stocks and real GDP in China further than if quotas were eliminated gradually over 5 years. As a result China does significantly better when the ATC is delayed, whereas North America and Europe, the countries responsible for the delay, experienced lower welfare gains as a result of slower implementation. Overall world welfare increase as a result of this delay by \$2492 million US.

Finally, insight into the motivation for delayed implementation of the ATC for China may be obtained by examining the sectoral results. Here we see that employment in the North American wearing apparel sector is predicted to be cut by half in the next 20 years in the absence of China's accession. Bringing China into the WTO reduces that projection to 25 percent of current employment levels in 2020. These job losses are delayed (although not avoided) when the quotas are more gradually phased out. Thus the key question with regard to timing is whether the diminished aggregate welfare gains to the ATC importers are of less value than the more gradual sectoral adjustments. For China's part, it appears that delayed implementation may actually be beneficial – provided the quotas are ultimately abolished in 2010.

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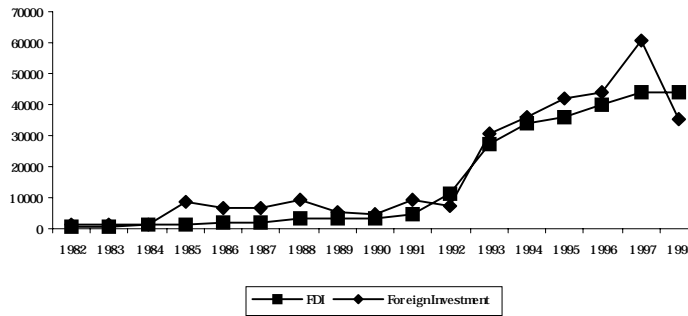
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Table 1
Results for China’s Accession: Cumulative Percentage Differences in 2020

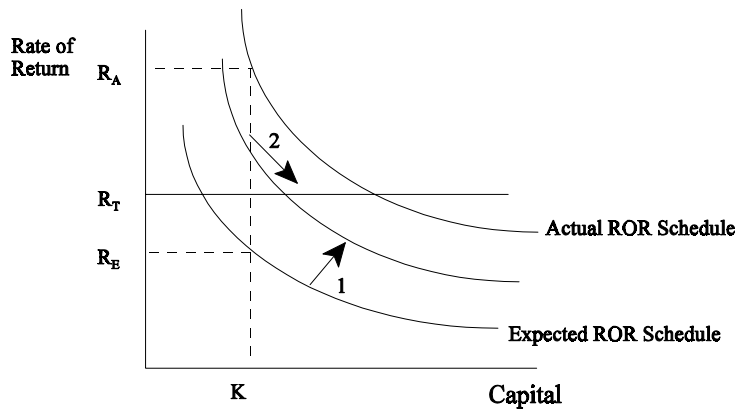
	CHN2005			ATC2010		
	Capital Stocks	Real GDP	Welfare (\$US million)	Real GDP	Capital Stocks	Welfare (\$US million)
China	8.1	8.7	23707	10.2	10.8	25652
Taiwan	9.3	4.4	2887	5.7	12.2	3143
NAmerica	0.05	0.03	5648	-0.03	-0.1	3093
WEurope	0.4	0.1	5247	0.1	0.4	4782
AusNZL	0.7	0.3	1068	0.3	0.8	1315
Japan	0.6	0.3	868	0.3	0.5	1200
OthNICs	1.4	0.6	1717	0.8	1.5	2325
Indonesia	-3.0	-1.6	-598	-2.0	-3.9	-560
OthSEA	-2.5	-1.7	-1517	-2.3	-3.3	-1719
India	-6.7	-2.9	-3114	-2.8	-7.3	-2404
OthSoAsia	-7.8	-4.0	-1679	-3.7	-7.7	-1223
Brazil	-0.5	-0.3	-762	-0.5	-1.0	-1090
OthLatAm	-2.2	-1.2	-1288	-1.5	-2.8	-985
Turkey	-5.1	-3.3	-1414	-3.9	-6.1	-1548
OthMENA	0.5	0.1	3421	0.1	0.6	4076
EIT	-0.2	-0.05	1464	-0.1	-0.4	1792
SoAfrCU	0.8	0.2	332	0.2	0.8	415
OthSSA	-0.08	-0.3	682	-0.3	-0.2	856
ROW	-2.9	-1.6	-974	-1.9	-3.6	-933
World			35695			38187

Figure 1: Foreign Investment in China



Source: IMF Balance of Payments Statistics, 1999.

Figure 2: Expected and Actual Rate of Return Schedules



Source: Adapted from Ianchovichina and McDougall (1999)

Figure 3: Rate at which ATC Quotas are reduced over Time

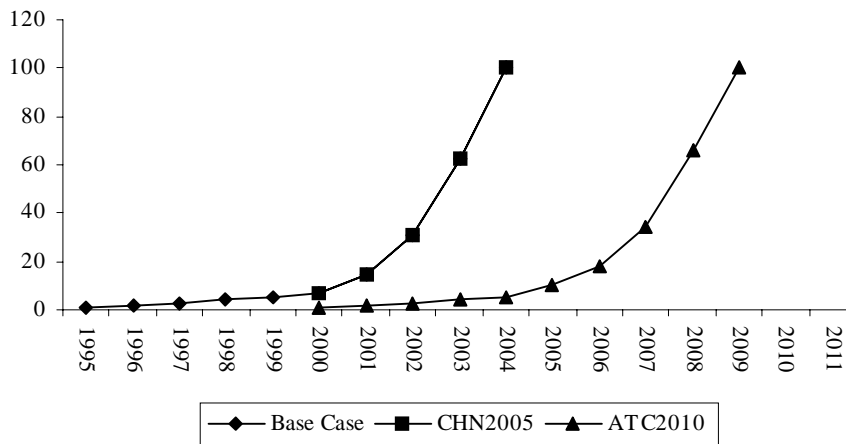


Figure 4: Foreign Ownership of Chinese Assets: Base Case versus CHN2005

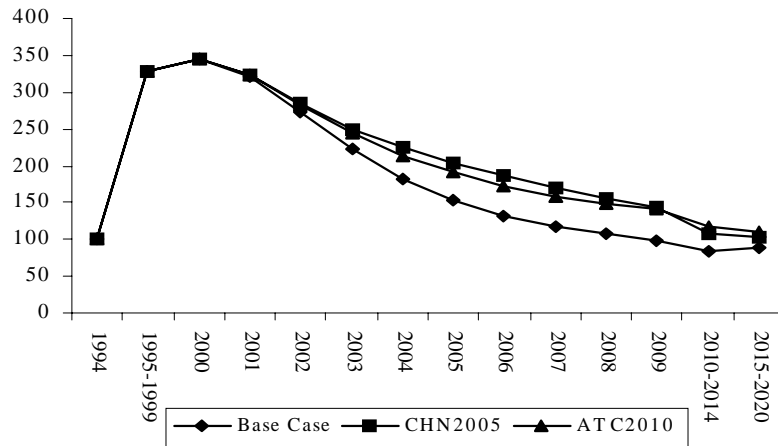


Figure 5: Cumulative Percentage Differences from Base Case in China's Price of Capital Goods

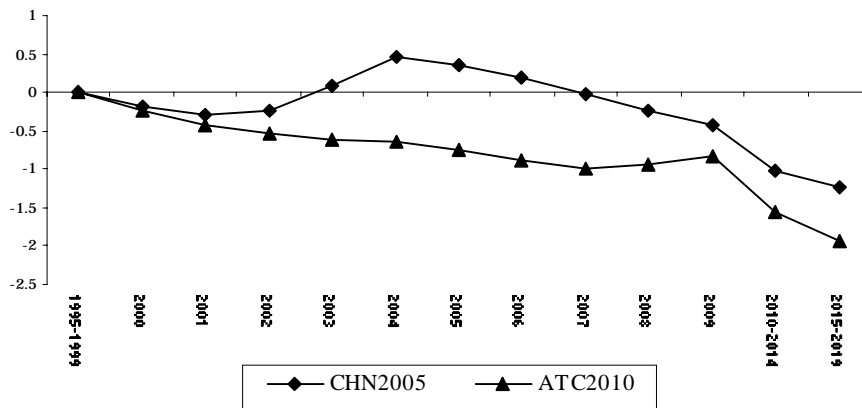


Figure 6: Cumulative Percentage Differences from Base Case in China's Actual Rate of Return

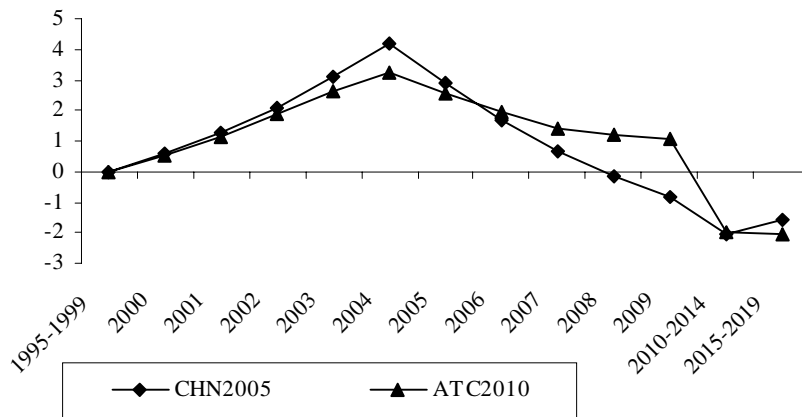


Figure 7: Cumulative Percentage Differences from Base Case in China's Real GDP

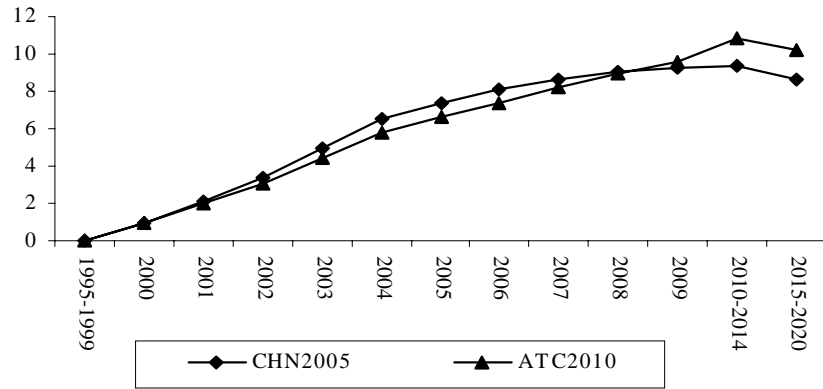


Figure 8: Cumulative Percentage Differences from Base case in North America's Real GDP

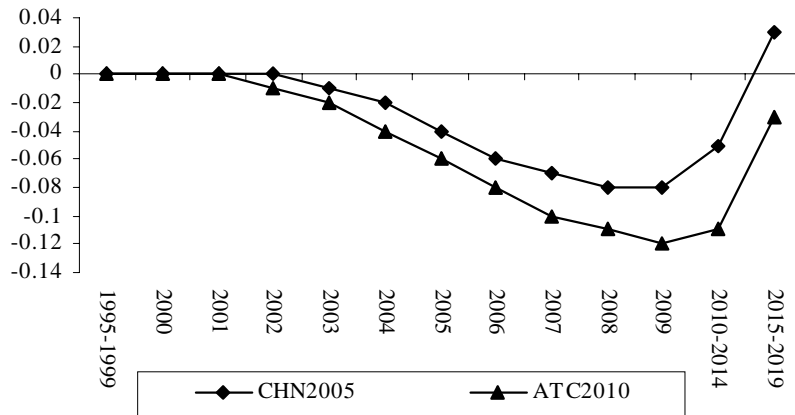


Figure 9: Cumulative Percentage Differences from Base case in India's Real GDP

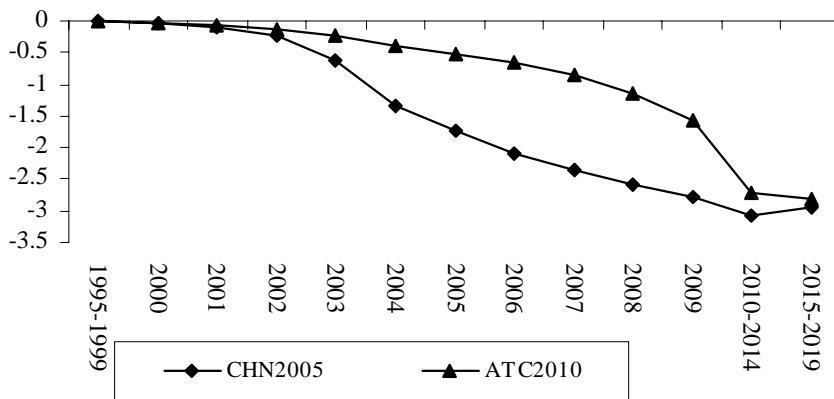


Figure 10: Employment in China's Wearing and Apparel Sector

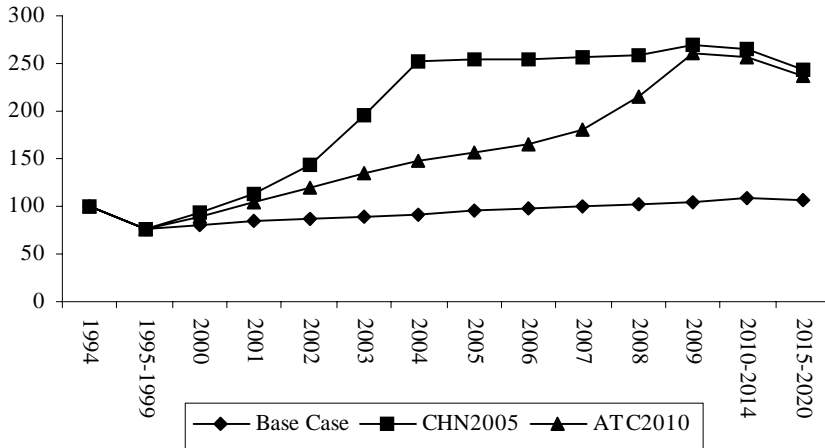


Figure 11: Employment in North America's Wearing Apparel Sector

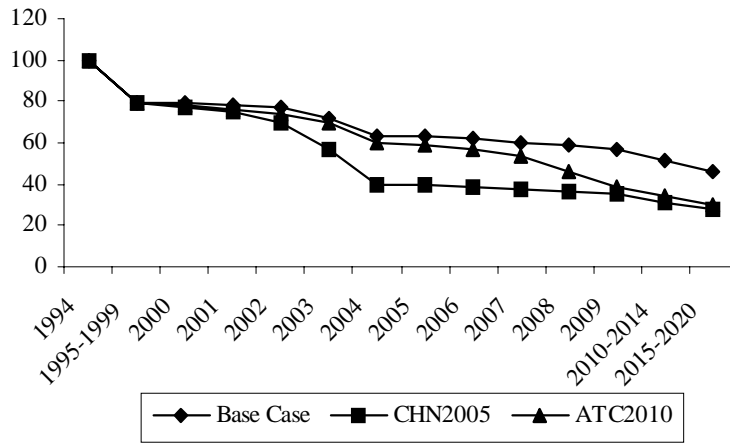


Figure 12: Employment in India's Wearing Apparel Sector

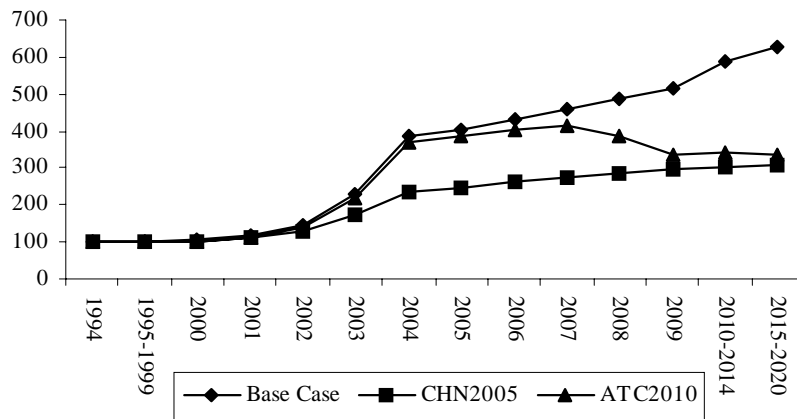


Figure 13: Cumulative Percentage Differences from Base Case in China's Other Manufactures Sector

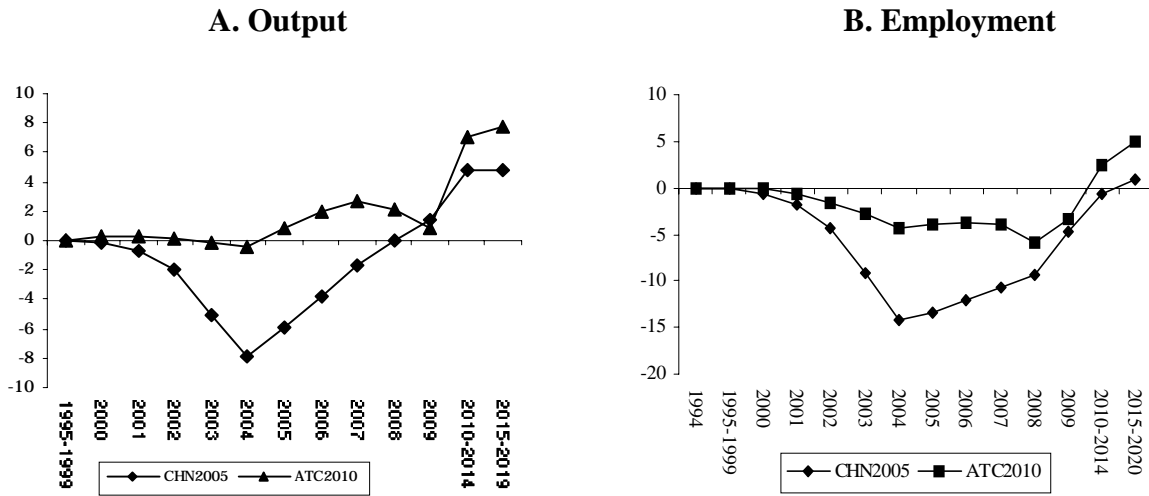


Figure 14: Cumulative Percentage Differences in Employment in China's Electronics Sector

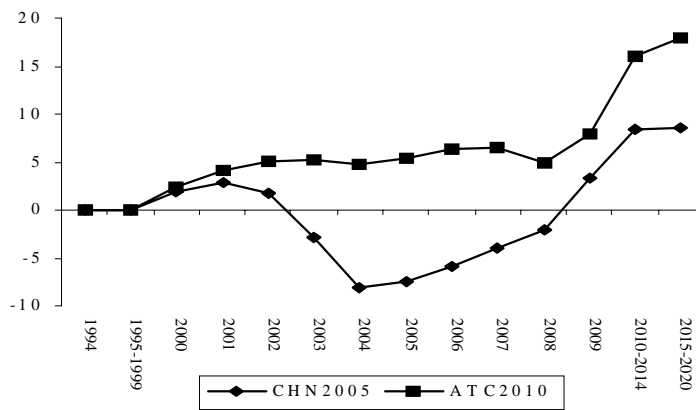


Figure 15: Cumulative Percentage Differences in Employment in India's Electronics Sector

