# The New Goods Margin in Japanese-Chinese Trade

Dalton, John

October 2013

# The New Goods Margin in Japanese-Chinese Trade*

**John T. Dalton**†
Wake Forest University

October 2013

**Abstract**

This paper uses the methodology developed in Kehoe and Ruhl (2013) to measure the change in the extensive, or new goods, margin of trade between Japan and China after China's entry into the World Trade Organization in 2001. The new goods account for 15.9% of Japanese exports to China and 22% of Chinese exports to Japan after trade liberalization. For the case of Chinese exports to Japan, a time series measure shows the growth in new goods coincides with the timing of the trade liberalization.

**JEL Classification: F10, F13, F14**
**Keywords: extensive margin, international trade, trade liberalization, Japan, China**

*Financial support from the BB&T Center for the Study of Capitalism at Wake Forest University is gratefully acknowledged.

†Contact: Department of Economics, Carswell Hall, Wake Forest University, Box 7505, Winston-Salem, NC 27109. Email: daltonjt@wfu.edu

# 1 Introduction

The past two decades witnessed a rapid increase in the role played by the Chinese economy in the world economy as a whole. As Chinese growth surged, China emerged as a major global trader. The size of the Japanese economy and its own importance in world trade suggested the two countries would grow closer to one another through increased bilateral trade, especially given the countries' close proximity in Asia. Growth in bilateral trade between the countries did, in fact, occur. As a share of total Japanese trade, for example, trade with China increased by a factor of almost 6. Trade grew either along the intensive or extensive margin. This paper studies the growth along the extensive margin.

I organize my analysis around China's entry into the World Trade Organization (WTO) in 2001. Using the methodology developed in Kehoe and Ruhl (2013), I measure the growth in the extensive margin for Japanese exports to China and Chinese exports to Japan following this trade liberalization. Since I use goods-level trade data, I refer to the extensive margin as the *new goods margin*. Growth in the new goods margin occurs when previously non-traded goods become traded.

Decomposing the data according to the methodology in Kehoe and Ruhl (2013) shows the new goods margin grows more for Chinese exports to Japan than for Japanese exports to China. After China's entry into the WTO, new goods account for 22% of Chinese exports to Japan but only 15.9% of Japanese exports to China. Moreover, I present a time series measure showing growth in the new goods margin in Chinese exports to Japan coincides with Chinese entry into the WTO, which provides evidence for the importance of the new goods margin in generating trade growth after a trade liberalization. The growth in the new goods margin in Japanese exports to China, however, does not coincide with Chinese entry into the WTO but occurs later in my sample period.

The results for the Japanese-Chinese case can directly be compared to the experiments in Kehoe and Ruhl (2013) and Amarsanaa and Kurokawa (2012) for the cases of U.S.-Chinese trade and Mongolian-Chinese trade after China's entry into the WTO. Kehoe and Ruhl (2013) presents evidence for growth in the new goods margin in both U.S. exports to China and Chinese exports to the U.S. which is similar in magnitude and timing to other trade liberalization episodes

studied by the authors, such as the adoption of the North American Free Trade Agreement (NAFTA), and found elsewhere in the literature (see below). Applying the Kehoe and Ruhl (2013) methodology, Amarsanaa and Kurokawa (2012) finds even larger growth in the new goods margin in Mongolian-Chinese trade and shows this growth coincides with China's entry into the WTO. The new goods account for 40% of Mongolian exports to China and 78% of Chinese exports to Mongolia.

My results provide both positive evidence for the importance of the new goods margin in international trade and identify an area for future trade growth for policy-makers. In the case of Chinese exports to Japan, the results highlight the effect a trade liberalization has on the new goods margin. Trade economists and policy-makers should consider these empirical findings when conducting policy analysis. Models without an extensive margin would be ill suited to evaluating the effects of a trade liberalization, for example. In the case of Japanese exports to China, the results suggest Japanese exporters did not take full advantage of China's entry into the WTO across a large number of goods. Japanese policy-makers interested in improving export performance should consider ways to generate growth along the new goods margin.

Other studies in the literature have found evidence linking trade liberalizations with growth in the extensive margin. In the case of Costa Rica, Arkolakis, Demidova, Klenow, and Rodríguez-Clare (2008) finds growth in imported varieties coincides with a period of trade liberalization. Using the methodology developed in Kehoe and Ruhl (2013), Sandrey and van Seventer (2004), Mukerji (2009), and Dalton (2013) all document growth in the new goods margin after trade liberalizations. Sandrey and van Seventer (2004) finds the new goods account for 29.5% of New Zealand exports to Australia and 21.9% of Australian exports to New Zealand after trade liberalization between the two countries. Mukerji (2009) finds India's unilateral trade liberalization resulted in the new goods accounting for 33.8% and 26.5% of total imports and exports, respectively. Dalton (2013) measures the effects of the 2004 enlargement of the European Union on the new goods margin in trade between Austria and the ten new member countries. The new goods grow to account for, on average, 42% of Austrian exports and imports to and from the enlargement countries.

The remainder of the paper is organized as follows: Section 2 provides a brief look at the growth in Japanese-Chinese trade since 1990. Section 3 describes the Kehoe and Ruhl (2013)

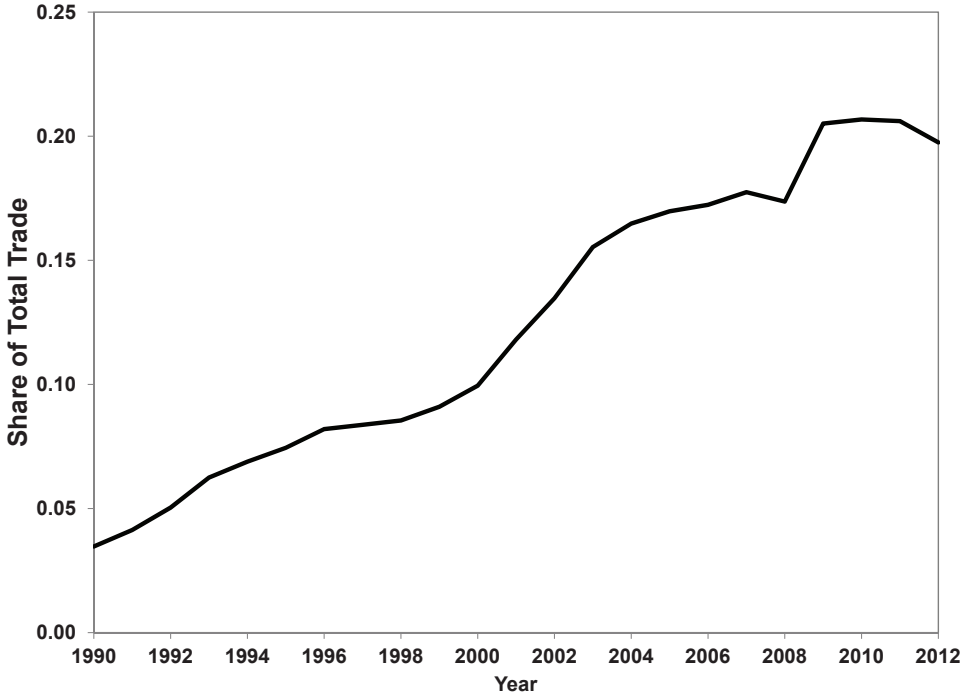


Figure 1: Japanese Trade with China

methodology used to measure the new goods margin in the analysis. I present the results of the analysis in section 4. Section 5 concludes.

# 2 Growth of Japanese-Chinese Trade

Figure 1 documents the growing importance of international trade between Japan and China since 1990. The data are taken from the Organisation for Economic Cooperation and Development's (OECD) *ITCS International Trade by Commodity Database*. To be consistent with the empirical analysis later in the paper, I only use data from the SITC Revision 2 classification system. The series in figure 1 measures the total value of Japanese exports to China plus imports from China as a share of the total value of Japanese exports to the world plus imports from the world. Japanese trade with China increases as a share of total Japanese trade from a low of 0.0347 in 1990 to a high of 0.2068 in 2010, a factor of almost 6. China has clearly become a more important trading partner for Japan over the last two decades, an event mirroring China's

growing role in international trade in general. Chinese entrance into the WTO in 2001 played an important part in China's emergence as a major global trader. Figure 1 shows the effects of WTO membership in the Japanese data. The rapid growth in the share of Japanese trade with China in the early 2000s coincides with the period when China enters the WTO.

Although figure 1 documents a large quantitative change in Japanese-Chinese trade, the trade share series, from an aggregate perspective, is not surprising. A simple gravity framework suggests two large economies in close proximity should be trading heavily with one another. If one of those economies was long shrouded in institutional darkness and closed off to international markets but then undertook reforms and began the process of openness, then a growing trade share between the two would be expected. Figure 1 remains silent about the margins along which Japanese-Chinese trade growth occurred, however. Measuring how much trade grows along the intensive and extensive margins is important, because it informs economists about the choices they should make when employing structural models of international trade.

# 3 Kehoe and Ruhl (2013) Methodology

I follow the procedure developed in Kehoe and Ruhl (2013) to measure the extensive margin in Japanese-Chinese trade at the goods-level, the so-called new goods margin. The goods data are annual trade flow data between Japan and China measured as 4-digit SITC Revision 2 codes, i.e. I consider each 4-digit code a good. One of the strengths of this approach is that data are readily available for a large number of countries. The data I use on Japan and China are from the OECD's *ITCS International Trade by Commodity Database*. Since growth in the extensive margin of trade measures when goods switch from being non-traded to traded from one period to the next, what it means for a good to be non-traded in the 4-digit codes data needs to be defined. Feenstra (1994), Hummels and Klenow (2005), and Broda and Weinstein (2006) define goods with a trade value of \$0 as non-traded, whereas Evenett and Venables (2002) sets a cut-off of \$50,000 or below. As Kehoe and Ruhl (2013) points out, however, applying a fixed cut-off generates a number of concerns. Customs officials often do not require firms to report small value shipments, so zeros in the trade flow data might not actually reflect the true trade flow. Large countries report fewer zeros due purely to size. Applying the same fixed cut-off across

countries does not account for differences in the relative importance of a good in a country's trade. Instead of using a fixed cut-off, Kehoe and Ruhl (2013) allows the dollar value of the cut-off to vary across countries by defining non-traded goods by their relative importance, or unimportance, in a country's trade.

In order to analyze the new goods margin over a particular sample period for a bilateral trade flow, I follow Kehoe and Ruhl (2013) and partition the 4-digit codes data into ten bins, each representing 10% of the value of the total trade flow at the beginning of the sample period. Some codes are split across bins to exactly match 10% of the trade flow. By ordering the codes from smallest to largest trade value and then cumulating the codes, the first bin of codes represents the set of *least-traded goods*. Least-traded goods can include goods reported with zero trade value or goods traded in some positive amount. The set of least-traded goods defined in this way is the analogue in Kehoe and Ruhl (2013) of the set of non-traded goods determined by a fixed cut-off. The ordering of the codes is not sensitive to the choice of the base year, because I order the codes based on the average trade of the first three years of the sample period. Kehoe and Ruhl (2013) analyzes the data in two ways. The first measures the trade share of each bin at the beginning, by definition 10%, and end of the sample period, which shows how the distribution of goods in the trade flow changes over time. The second tracks the trade share of the set of least-traded goods over the entire sample period, which captures changes in the new goods margin. This time series measure is useful for determining the impact of shocks or policy changes, such as trade liberalizations, on the new goods margin.

# 4 Results

I organize my analysis of Japanese-Chinese trade around such a change, namely Chinese entry to the WTO in 2001. In order to identify the effects of WTO entrance, I define the sample period as 1996-2006, which is similar in length to the sample periods considered in Kehoe and Ruhl (2013). I first consider Japanese exports to China, then Chinese exports to Japan. My experiment may not be clean if the period I consider also contains structural changes impacting the composition of exports. Insofar as the move towards greater openness drives the structural changes, however, Chinese entrance into the WTO represents a natural point around which to

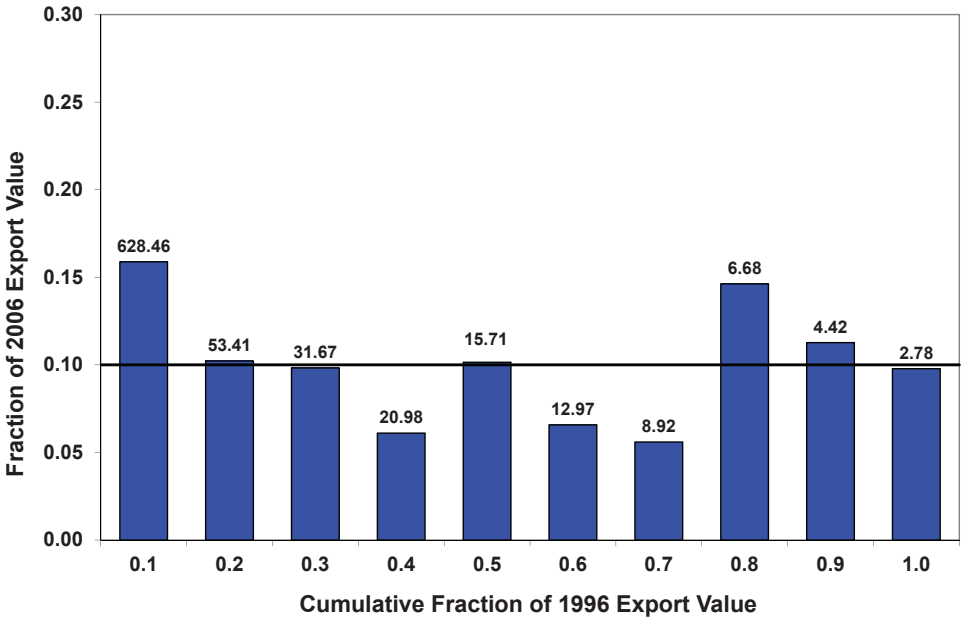


Figure 2: Composition of Exports: Japan to China

center my analysis. Moreover, my results do suggest WTO membership had a direct impact on the new goods margin over and above any other structural changes occurring in the Chinese economy.

Figure 2 shows the change from 1996 to 2006 in the distribution of goods being exported from Japan to China. The x-axis measures the cumulative fraction of the 1996 export value. Each of the bars coincides with a bin consisting of goods ordered based on the average trade value for the years 1996-1998. Since each bin represents exactly 10% of the 1996 export value, cumulating from left to right always increases the fraction by 0.1. Of course, the set of least-traded goods is then the first bar. The y-axis measures the fraction of 2006 export value. The horizontal black line at 0.10 shows the height of each bar had there been no changes to the distribution of goods from 1996 to 2006. The number over each bar designates the number of goods in each bin. The results in Kehoe and Ruhl (2013) suggest the set of least-traded goods typically consists of a large number of goods. The least-traded goods in Japanese exports to China are consistent with this finding. Approximately 80% of the total possible goods appear

in the set of least-traded goods. Given the large number of least-traded goods, there is potential for large growths in trade along the new goods margin.

Figure 2 documents the set of least-traded goods grows from 10% of Japanese exports to China in 1996 to 15.9% in 2006, which shows growth along the new goods margin during this period. To get a sense of how this growth compares to other trade liberalization cases, however, consider Kehoe and Ruhl (2013) finds the least-traded goods account for 25.3% of Mexican exports to Canada and 30.3% of Canadian exports to Mexico after the adoption of NAFTA. On the other hand, only 12.1% of U.S. exports to Canada and 13.7% of U.S. exports to Mexico are accounted for by the set of least-traded goods after NAFTA. The trade liberalization episodes analyzed in Sandrey and van Seventer (2004), Mukerji (2009), Amarsanaa and Kurokawa (2012), and Dalton (2013) all resulted in larger growth in the new goods margin than that experienced for Japanese exports to China. Although there is growth along the new goods margin in Japanese exports to China, the growth was not as much as that experienced during other trade liberalization episodes and ranks near the bottom of the episodes analyzed using the methodology in Kehoe and Ruhl (2013). This result is even more surprising given the potential for large growth in the new goods margin captured by the fact that approximately 80% of the total possible goods are classified as least-traded goods. Japanese exporters appear to not have taken full advantage of Chinese entrance into the WTO across a large number of least-traded goods.

Before moving on to analyze the timing of the growth in the new goods margin, it is worth pointing out the bin experiencing the next largest increase in its share of Japanese exports to China is the eighth bin in figure 2. These goods grow from 10% of Japanese exports to China in 1996 to 14.6% in 2006 and include two important export categories for Japan, SITC 4-digit codes 7849, other parts and accessories of motor vehicles, and 7810, passenger motor cars, for transport of passengers and goods.

So, when did the growth in the new goods margin actually occur? Figure 3 tracks the share of the least-traded goods in Japanese exports to China from 1996 to 2006. The least-traded goods hover around 11% of Japanese exports until the year 2005, after which the share ultimately increases to 15.9% in 2006. Figure 3 suggests Chinese entrance into the WTO had no immediate effect on the share of least-traded goods in Japanese exports to China. This is in sharp contrast to the experience of Chinese exports to Japan, to which I now turn.

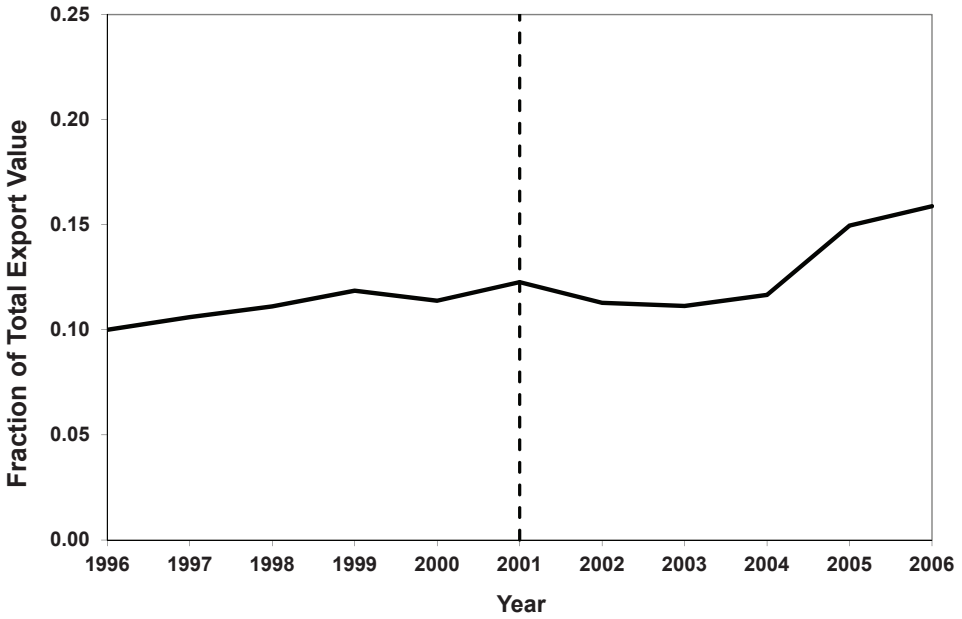


Figure 3: Exports: Japan to China

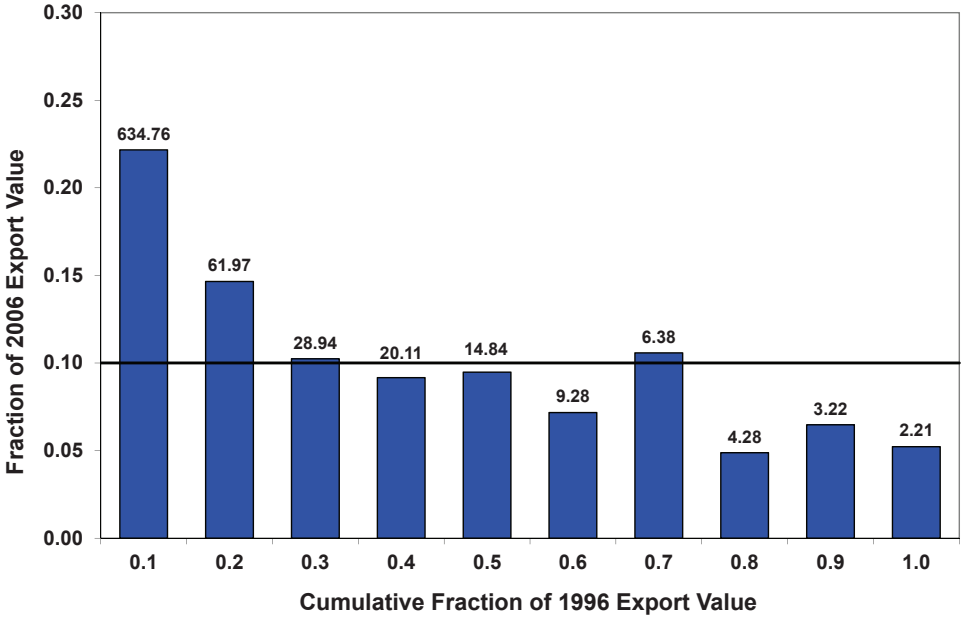


Figure 4: Composition of Exports: China to Japan

Figure 4 shows how the distribution of goods being exported from China to Japan changed from 1996 to 2006. The set of least-traded goods consists of nearly 81% of the total possible goods traded, which is similar to the number of least-traded goods in Japanese exports to China. The least-traded goods grow from 10% of Chinese exports to Japan in 1996 to 22% in 2006. The magnitude of this growth is more in line with trade liberalization episodes experiencing the largest growth in the share of least-traded goods, as reported in Kehoe and Ruhl (2013), Sandrey and van Seventer (2004), and Mukerji (2009). The bin of goods experiencing the next largest increase in its share of Chinese exports to Japan is the second bin in figure 4. These goods grow from 10% in 1996 to 14.6% in 2006. The goods in the second bin are not least-traded goods and do not contribute to growth in the new goods margin, as I am using these terms here. However, given the ordering of the goods, the goods in the second bin still represent goods which are less important in 1996 than the goods in the remaining eight bins. Considering the growth in the share of the second bin strengthens the picture emerging from figure 4, namely that the composition of Chinese exports to Japan changed from 1996 to 2006 because least-traded goods and, if you will, less-traded goods grew in importance.

Moreover, the time path of the share of least-traded goods suggests Chinese entrance into the WTO had a real effect on the composition of Chinese exports to Japan over and above any structural changes which may have been occurring in the Chinese economy during the same time period. Figure 5 shows an acceleration in the share of least-traded goods after China enters the WTO in 2001. Before entering the WTO, the set of least-traded goods had only increased from 10% to 12% of Chinese exports to Japan. After entering the WTO, the least-traded goods steadily increase to 22% of Chinese exports to Japan.

Kehoe and Ruhl (2013) and Amarsanaa and Kurokawa (2012) conduct similar experiments to the one presented here by measuring the change in the new goods margin in U.S.-Chinese and Mongolian-Chinese trade after Chinese entry into the WTO and, thus, provide comparisons for the case of Japanese-Chinese trade. For U.S. exports to China, the least-traded goods grow from 10% to 21.2% of the trade flow. The least-traded goods in Chinese exports to the U.S. grow by even more, from 10% to 25.7%. The least-traded goods grow from 10% to 40% for Mongolian exports to China and from 10% to 78% for Chinese exports to Mongolia. Compared to the magnitude of the growth seen here, from 10% to 15.9% (Japanese exports to China) and

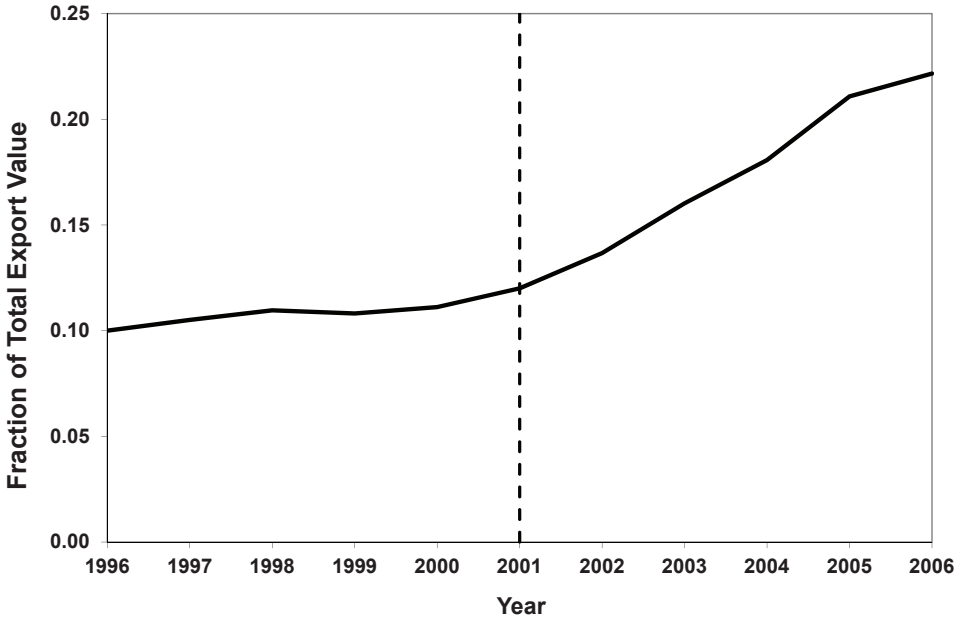


Figure 5: Exports: China to Japan

22% (Chinese exports to Japan), the new goods margins in U.S.-Chinese and Mongolian-Chinese trade saw greater changes than the one experienced in Japanese-Chinese trade. Out of these six trade flows, Japanese exports to China stand out as underperforming. Chinese entry into the WTO not only has no immediate effect on the share of least-traded goods in Japanese exports to China, but the growth in these least-traded goods also lags behind that experienced by the least-traded goods in U.S. and Mongolian exports to China.

# 5 Conclusion

Both Japanese exports to China and Chinese exports to Japan experience growth along the new goods margin during the period surrounding China's entry into the WTO. Only growth in the new goods margin in Chinese exports to Japan, however, coincides with the timing of China's entry into the WTO. Japanese exporters appear to not have taken full advantage of China's entry into the WTO across a large number of goods. Understanding why this growth failed to occurred provides an avenue of future research and will shed light on the evolving relationship

between Japan and China. Despite ongoing political tensions between the two countries, growth along the new goods margin in Japanese exports to China represents one area in which Japan and China may become more closely tied to one another in the future.

# References


Amarsanaa, C., and Y. Kurokawa (2012): "The Extensive Margin of International Trade in a Transition Economy: The Case of Mongolia," working paper.

Arkolakis, C., S. Demidova, P. J. Klenow, and A. Rodríguez-Clare (2008): "Endogenous Variety and the Gains from Trade," *American Economic Review*, 98(2), 444–450.

Broda, C., and D. E. Weinstein (2006): "Globalization and the Gains from Variety," *Quarterly Journal of Economics*, 121(2), 541–585.

Dalton, J. T. (2013): "EU Enlargement and the New Goods Margin in Austrian Trade," working paper.

Evenett, S. J., and A. J. Venables (2002): "Export Growth in Developing Countries: Market Entry and Bilateral Trade Flows," working paper.

Feenstra, R. C. (1994): "New Product Varieties and the Measurement of International Prices," *American Economic Review*, 84(1), 157–177.

Hummels, D., and P. J. Klenow (2005): "The Variety and Quality of a Nation's Exports," *American Economic Review*, 95(3), 704–723.

Kehoe, T. J., and K. J. Ruhl (2013): "How Important Is the New Goods Margin in International Trade?," *Journal of Political Economy*, 121(2), 358–392.

Mukerji, P. (2009): "Trade Liberalization and the Extensive Margin," *Scottish Journal of Political Economy*, 56(2), 141–166.

Sandrey, R., and D. van Seventer (2004): "Has the New Zealand/Australian Closer Economic Relationship (CER) Been Trade Widening or Deepening?," Forum Paper 2004, African Development and Poverty Reduction: The Macro-Micro Linkage.