

Forces behind China's Surging Trade: Competitiveness or Policy Driven?

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Abstract: This paper delves into China's differential growths in trade flows with high income countries by focusing on bilateral content of trade data over the time period 1962-2005. Unlike other studies, we account for end use of traded goods ranging from primary, intermediate, and finished goods because China's policies impact all segments China's trade flows. China's trade growth patterns with major high income countries clearly indicate that the adjacency-neighborhood partners alone is unlikely to explain its unprecedented growth in exports and imports. China's outstanding performance in trade growth can be traced back to the 1970s with changes in its policies and increased involvement in the international segmentation of production processes and preferential tariff treatment to assembling and processing activities.

Key words: China, international trade, growth, policies.

The views expressed in this paper are those of the authors and not necessarily those of the Economic Research Service or of the United States Department of Agriculture.

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Introduction

China's total exports grew 450 percent between 1992 and 2005 (Figure 1), reaching a total approximately \$960 billion in 2006. Since joining the World Trade Organization (WTO) in 2001, China has now emerged as the world's largest single exporting nation of merchandise. China benefits from a competitive advantage relative to other countries not only in labor cost and availability (quantity) but also in its proximity to capital-rich East Asian economies and rapidly growing developing Asia-Pacific region's markets. Geographic proximity often explains why neighboring countries trade disproportionately, as Krugman (1991) suggests that neighborhood trade is so strong as to create natural trading blocs, but such explanations provide little insight into the sources of *growth* in China's trade. The highly visible and sustained trade growth raises many questions about how it is attainable. Although most attention is focused on China's exports, China's imports have been equally impressive but largely ignored. Trade growth should be viewed in a broad context by understanding the complete bilateral make-up of exported and imported goods with China's main trading partners.

The expansion of China's international trade has been facilitated by a global reduction in trade barriers and the adoption of openness policies such as establishing economic and technological development zones (ETDZs) and foreign-invested enterprises (FIEs) has also been the key to its rising position in the global economy with average annual growth rates of trade at three time world rates. Typically multinational

firms will make decisions whether to export or to produce in a foreign market using foreign direct investment (FDI). However, China is not the final destination for the bulk of finished industrial goods manufactured in China. Our analysis is focused on China's inward and outward trade flows which in turn could be primarily motivated by FDI related activities. China's trade reforms, before and after its accession to the WTO, brought about continuous reductions in non-tariff barriers and in levels and dispersion of tariffs. This allowed China to exchange goods and services at world market prices and enjoy increased benefits from its comparative advantages. Because of relative inexpensive cheap labor, favorable FIEs, and "customs regimes" China has emerged as a final processing and assembly platform for finished goods that previously were manufactured in neighboring countries but destined for markets in EU, North America, and high income Asian countries. Foreign firms have adopted outsourcing policies that localize the production components to utilize China's comparative advantages (Feenstra, Hanson 1995 and 1996; Fukasaku and Kimura, 2002). Empirical studies suggest that trade in intermediate goods is an important channel for transmission of technology to developing countries and the easiest way to benefit from technological spillovers that allows for increase in total factor productivity (Coe and Helpman, 1995; Coe, Helpman, and Hoffmaister, 1995; Keller, 2001). China provides a case advancing this matter because of its trade policy favoring processing operations through tariff exemption on intermediate goods, used as inputs in manufacturing. In other words, China can exploit effective protection policies that are associated with a reduction of tariffs on intermediate goods while the effective rate on the final goods increases.

This study seeks to assess China's patterns of trade growth by decomposing China's trade flows specifically with the developed countries. Since liberalization typically occurs in stages, and domestic and international markets do not instantaneously adjust, shifting trade patterns likely take place in less predictable phases of accelerating and decelerating spurts over a time span. Structural and macroeconomic-based models have little in the way capturing such growth dynamics seen in actual trade. Given the lack of an appropriate analytical framework to depict such dynamics we focus our attention on a flexible statistical approach applied to bilateral sector trade data for the period 1962-2005.

The rest of the paper is organized as follows. In the next section, we present the methodology used to estimate the underlying long-term trends in rates of growth in China's trade flows with high income countries. The results supporting our analysis are presented in a series of charts based on the model's output. One main finding is that China's strong specialization in the downstream segments of production can be associated with a selective trade policy that granted preferential tariff treatment to assembling and processing activities. This strategy takes advantage of China's abundant workforce. The result of this form of policy-induced specialization is large deficits in the upstream segments (import-intensive parts and components) and rapid diversification in consumption goods.

Methodology

Our technique for analyzing China's trade is based on the Trend and Cycles Decomposition (TCD) approach. This approach, by capturing the dynamics of growth in

trade and trade policy regimes, allows us to obtain factually based evidence that a purely structural model is not likely to provide with misspecified links to trade growth. We utilize a time series of trade flows from the United Nations (UN) bilateral trade data to analyze China's trade path in the past 44 years. To capture the dynamic features of China's trade, we use its annualized growth rates. The resulting series of growth rates exhibit relatively large annual variability due to a variety of reasons. Many of the causes for these fluctuations in year to year data are not essential for capturing a "true" trajectory in China's trade growth. Instead, these deviations tend to obscure the underlying longer-term trend in trade growth rates. The longer-term trends in China's trade growth should better reveal the relationship either ex-post or ex-ante to prevailing China's trade patterns. Thus, we employ the TCD methodology to remove or 'filter' these fluctuations from the primary data.

For our purposes, we choose the approach developed by Hodrick and Prescott (HP) (1997) in their study of business cycles. Following this approach, the observed time series, y_t , are viewed as the sum of cyclical components, c_t , and growth components, g_t , or

$$y_t = g_t + c_t, \quad \text{for } t = 1, \dots, T \quad (1)$$

Our prior knowledge, based upon economic growth theory, is that growth components follow their secular evolution. The measure of the smoothness of the $\{g_t\}$ path is the sum of the squares of its second difference. The variable c_t is the deviation from g_t . The notion is that, over long time periods, the cycles, c_t , where $c_t = y_t - g_t$, average near zero. This leads to the following programming problem for determining the underlying growth components in the observed time series y_t :

$$\min_{(g_t)_{t=1}^T} \left\{ \sum_{t=1}^T (y_t - g_t)^2 + \lambda \sum_{t=1}^T [(g_t - g_{t-1}) - (g_{t-1} - g_{t-2})]^2 \right\}. \quad (2)$$

The parameter λ is a positive number that penalizes variability in the growth component of the series. The larger the value of λ , the ‘smoother’ is the underlying growth trend g_t . For a sufficiently large λ , at the optimum all $g_{t+1} - g_t$ must be arbitrarily near some constant β and therefore the g_t arbitrarily near $g_0 + \beta t$. This implies that in the limit, as λ approached infinity, the solution is the least squares fit of a linear time trend mode, and for $\lambda=0$, the smoothed data are exactly the same as the sample data.

The selection of *the smoothing parameter* λ is based on a probability model. If the cyclical components and the second differences of the growth components are identically and independently distributed normal variables with mean zero and variances σ_1^2 and σ_2^2 (which they are not), then the conditional expectation of the g_t , given the observations, would be the solution of the above equation when $\sqrt{\lambda} = \sigma_1 / \sigma_2$.

Different values of λ provide different information, e.g., a large value of λ approximates the annual average rate of growth given by an ordinary least squares fit to the log of the data. The problem is to choose the value of λ that best depicts the underlying growth component in the data, and then to employ that value ($\lambda = 20$, in this study) for all data series over the period 1962-2005.

China did not share public trade statistics with international organizations until 1984 and even then the validity of some reported trade flows remained questionable. Thus we draw upon data providing China reporting partners compiled by the UN starting from 1962. To capture more clearly the dynamic features of China’s trade and

competitiveness, we calculate the annual growth rate of its agricultural and non-agricultural trade using aggregates of Broad Economic Categories¹. Unlike other studies that concentrate on China's trade with the U.S. (Hammer, 2006, Nauhgtton, 2004) we include all China's major high-income trade partners. We then use equation (2), with the value of λ set equal to 20, to smooth the value (expressed in logarithms) of China's bilateral trade in all merchandise. This is implemented using the General Algebraic Modeling System (GAMS, Brooke et al., 1998) software and by deriving the first- and second-order difference equations required to solve equation (2). Figure 2 captures the trade volatility of China's trade flow with the U.S., EU25, and high income Asia countries while figure 3 presents the growth pattern of the smoothed trade flow with the same countries. The series of China's total exports and imports are used as reference points. Growth paths calculated from the smoothed data are depicted and we discuss the results for China's trade with the USA, EU25, High Income Asian Countries, and the world.

Results- Aggregate Perspective

Exports

China's process of opening to world trade over the past 40 years is one of the key drivers of its trade and economic growth. The ongoing global relocation of labor-intensive manufacturing has accommodated China's trade growth, fundamental facet of its driver for economic growth, and boosted global demand. China's gradual transition into a more

¹ The Broad Economic Categories is based upon end-use of trade goods as defined by the UN Statistical Division. Because Hong Kong is used as a transshipment point for China's trade source-destination was readjusted by USDA/Economic Research Service in conjunction with U.S. International Trade Commission recent work valuating goods produced and sold from mainland China, so the bilateral trade in our database is consistent over time.

market-based economy and its ongoing integration into the multilateral world trading system made China the third largest trading nation in the past decade. In the 1970's (Figure 4) high income Asian countries, such as Japan, South Korea, and Taiwan, were among leading growth destinations for China's total merchandise exports. Growing trade dependency with China indicates that changes in China's trade openness policies generated relatively larger impact on its neighboring countries than the rest of the world as China emerged as Asia's production platform. In the 1980s and 1990s the growth patterns of China's exports show a significant departure from the previous decade as the United States was China's major growth destination in these two decades. The dollar appreciation in the early 1980s contributed to China's competitiveness stimulating import demand in the U.S. market. This is consistent with the prediction of macroeconomic-based trade models and reinforces the importance of economic conditions, such as currency depreciation or appreciation, on trade growth. Finally, in the 2000s EU countries seem to attract most of China's exports of all products as EU growth rate shows an upward trend in the most recent years (see figure 5).

Imports

It appears that once China chose to pursue economic reforms and a more open trade policy, growth in its imports developed rapidly in the 1970s. But unlike export growth, China's total merchandise imports from the US grew almost as fast as its imports from all sources surpassing import growth of neighboring Asian countries (Figure 6). However, in the 1990s and 2000s imports from Asia countries and the rest of the world grew the fastest increasing their shares over those of EU25 and the US (Figure 7). Moreover, in the 1970s China's imports grew by 137.21 percent and exports by 140.10 percent. In the

last 5 years, however, China's imports grew by 21.44 percent while its exports grew by only 18.20 percent, indicating China's growing dependence on goods from foreign suppliers.

Results- Detail Trade Growth Perspective

Intensive versus Extensive Margins

Decomposition of China's export and import growth is needed in order to gain further insight into how China's growth process is driven by its trade content. For this reason we organize the composition based upon the BEC classification into six broad product categories: *capital* goods, such as machinery except transport equipment, *consumer durable* goods, such as domestic appliances, *consumer non-durable* goods, such as food, footwear, and toys, *intermediate* goods, which includes broad categories of processed goods, parts and accessories mainly for industrial use, technological independent but produced in order to be assembled into final goods, *primary energy* goods, such as gas and petroleum, and, finally, *primary* goods, such as raw mineral and agricultural commodities.

In the 1970s, export growth of consumer durable and non-durable goods was over 250 percent while import growth of capital goods was a little over 250 percent (Figure 8) while in the late 1980s and 1990s China's capital goods exports took the lead indicating that China trade growth was broad based and not fueled by a few products. China has entered a growth phase in its industrial development for producing and exporting technology goods, or so-called intensive margin-type products. China has made tremendous strides in exports of high value-added technology products including

machinery, electronics, computer components, and telecommunications equipment in recent years. This pattern is in agreement with new trade theory that gives a dominant role to an expansion of the number of export varieties (the extensive margin), providing an additional channel for welfare gains from trade.

China has gained from globalization, particularly after joining WTO and given changing global production patterns where production and assembly of higher valued-added products is moved from other newly developed countries such as South Korea and Taiwan to China. In the 1970s China's import growth of intermediate goods was over 300 percent (Figure 9). Our analysis suggests that even with a stronger currency, China's bilateral imbalances may not subside immediately because of the large share of production costs are driven by goods purchased abroad.

Stable Diversification and Increased Specialization by Stages of Production

Numerous studies have analyzed the importance of trade in intermediate goods and the influence of geographic proximity on production sharing between countries (Naughton, 1997, Gupta, 1997, Ng and Yeats, 1999). China's trade performance indicates that geographic proximity is a factor enhancing the value-added processing chain. China's rise in international processing activities reflects the strategies of Asian firms to relocate their industries in the mainland to take advantage China's comparative advantage along production processing due mostly to low labor cost. Moreover, China's trade policy has favored assembly and processing operations, through tariff exemption on intermediate goods, and set off expansion of China's trade in intermediate goods in FIEs and ETDZs well beyond geographic proximity regions. This selective trade policy has accelerated

China's international processing activities, the engine of rapid diversification of its manufacturing exports.

In order to understand export diversification and specialization we focus on China's growth patterns comparing the same aggregate goods for the US and China's neighboring high income Asian countries. The growth paths of China's trade flows with the US and high income Asian countries are very distinct over the entire time period. Examining these patterns further enhances understanding of China's production of differentiated final goods. For the case of consumer non-durable goods, the export growth to high income Asian countries in the 1970s is replaced by the US export growth in the 1980s and 1990s (Figure 9). In the last 5 years however China's economic growth has 'pulled-up' import growth of non-durable above the export growth.

China's export growth pattern for durable goods is similar to non-durable goods (Figure 10). In the early 1970s China's export growth of consumer durable goods to Asia and the US was over 150 and 100 percent, respectively. In the late 1970s, China's imports of US durable goods increased by 125 percent while its imports from Asia increased by over 100 percent both surpassing export growth. In the 1980s and 1990s, China's export and import growth of durable goods to high income Asian countries and the US move very close.

China's export and import growth of capital goods follow a different pattern than that of final non-durable and final durable goods (Figure 11). Capital goods are those that firms purchase as investment goods such as heavy equipment and machines to replace existing capital or expand production. In the 1970s a surge took place in capital goods import growth from Asian countries and the US while China's export growth lagged

considerably. In the 1980s and 1990s, export growth of capital goods, by far the most important category all final goods, surpassed import growth. During the same period, capital goods export growth remained strong for both Asian countries and the US.

Intermediate products while amounting to almost two-thirds of China's total imports display China's comparative advantage in production 'by stage.' In other words, China's participation in the international division of production processed is not based on the transformation of raw materials but takes place in technologically advanced sectors (Ng and Yeats, 1999). China's processing trade pattern is characterized by strong geographical asymmetry, or in terms of growth rates, import growth of intermediate goods from Asia and the US close to 200 percent (Figure 12) while in the later years China's import growth of intermediate goods from high income Asian countries and export growth to the USA dominates the series (figure 13). It seems that the Krugman-Bhagwati debate, that is whether neighborhood determines the direction of trade or geographic proximity is irrelevant, is still applicable.

China's strong specialization in the downstream segments of production, such as computers, office machinery, is associated with large import growth of primary goods, such as raw grains, soybeans, and iron ore and other minerals from both high income Asian countries and the US (figure 14), especially in the 1970s and 1980s. Regarding primary energy goods China's import and export growth rates declined significantly in the recent years given the higher petroleum and coal prices (Figure 15).

Conclusions

This paper delves into China's differential growth rates in trade flows with high income countries by focusing on bilateral content of trade data over the time period 1962-2005. Unlike other studies, we account for the end use of traded goods ranging from primary, intermediate, and finished goods because China's policies impact all segments of China's trade flows. China's trade growth patterns with major high income countries clearly indicate that the adjacency-neighborhood partners alone is unlikely to explain its unprecedented growth in exports and imports. Each time period over the last 40 years can be characterized differently, especially in the early 1970s.

China's outstanding performance in trade growth can be traced back to the 1970s with changes in its policies and increased involvement in the international segmentation of production processes through FIEs and ETDZs. China's strong specialization in the downstream segments of production or processing can be associated with a selective trade policy that granted preferential tariff treatment to assembling and processing activities as well as FDI in those activities. This strong specialization is also linked with growth in deficits in the upstream segments (parts and components) and rapid diversification in consumption goods. Moreover, the technological content of intermediate goods has been a major channel for China's import growth of high technology goods which enabled China to compete as a formidable supplier in global manufacturing. While in the 1970s China's export and import growth on all goods with major high income countries is outstanding in the most recent years China's trade growth rates moderate but China still maintains a competitive edge. China's export growth is currently shifting away from textile-clothing products towards more high-technology

products (electronic machinery and equipment) would continue to underpin its upward growth of China's exports.

Our analysis based on ex-post long-term time series data highlights why China's exports and imports evolved with high income countries. By decomposing China's overall trade by major categories we gain deeper insight into causal relationships with policies and that have impacted China's export and import growth patterns. Further investigation into China's trade with other developing countries is needed to complement this work.

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Fig. 1-China's Exports, Imports, and Net Trade: 1962-2005

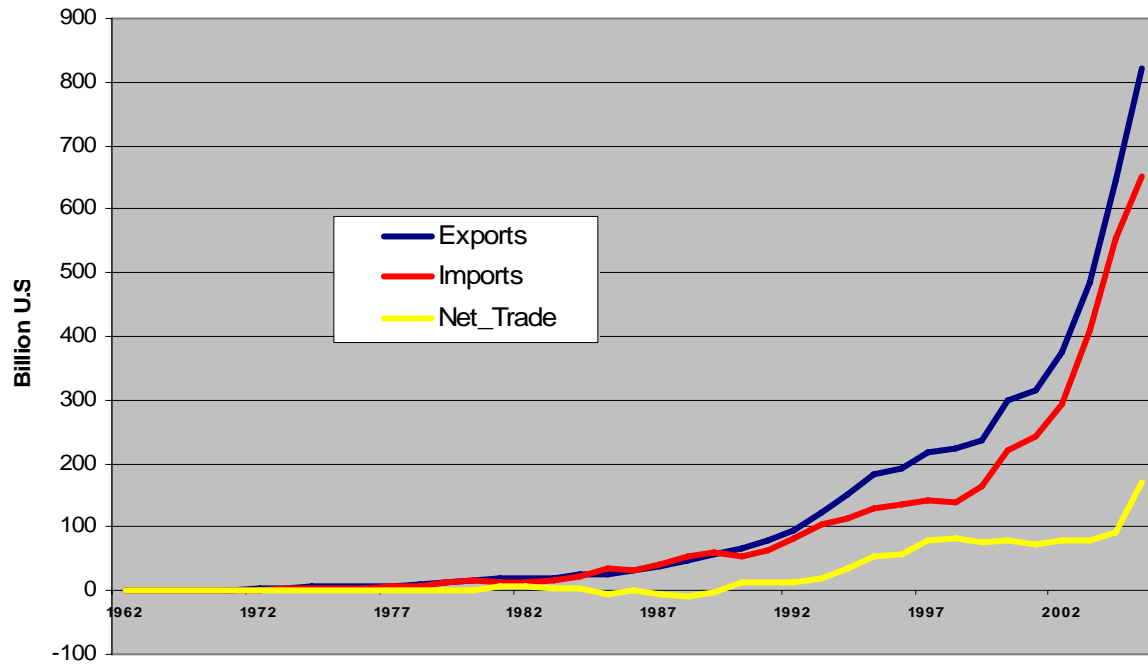


Fig.2-Growth in China's Trade Flow, 1980-2005
Very Volatile

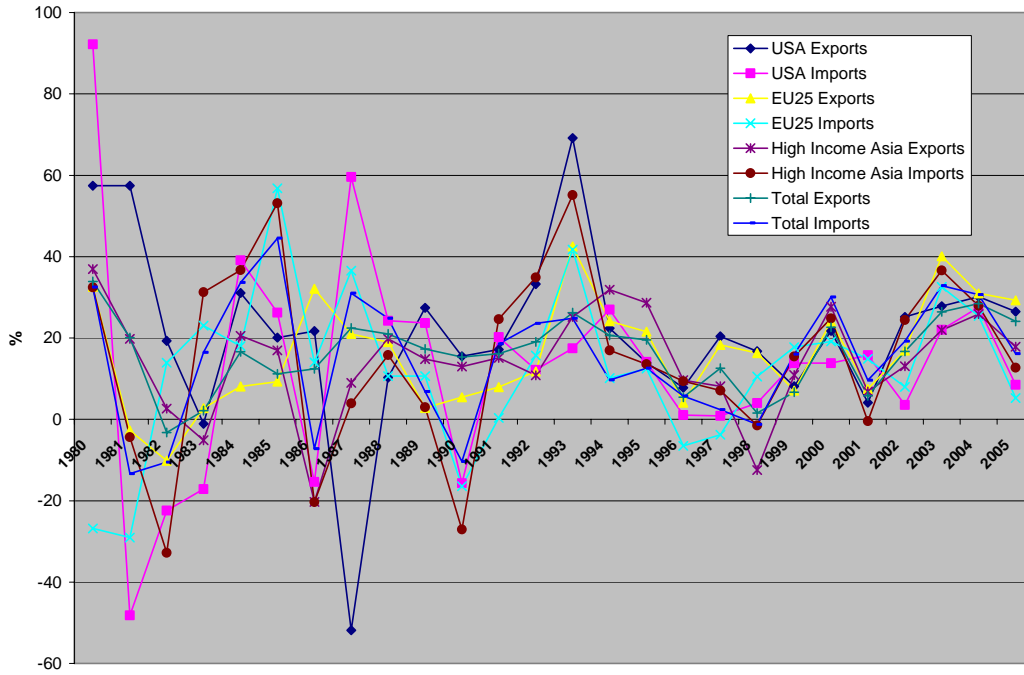


Fig.3-Growth patterns of China's Trade Flow of Filtered Series, 1962- 2005

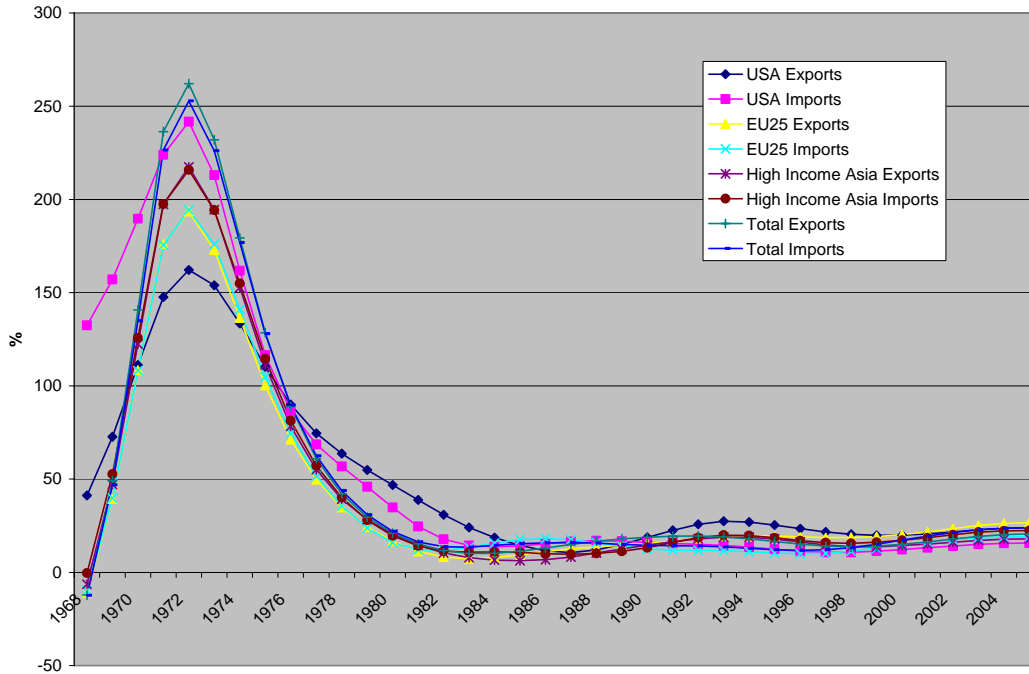


Fig. 4- Growth patterns of China's Exports to High Income Countries, All Products, 1963-2005

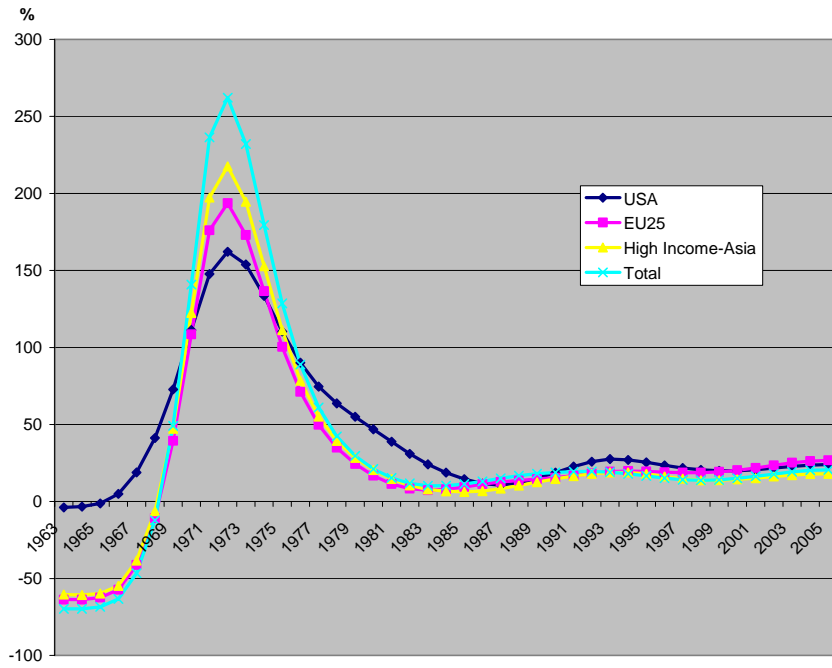


Fig. 5 --Growth Patterns of China's Exports to High Income Countries, All Products, 1980-2005

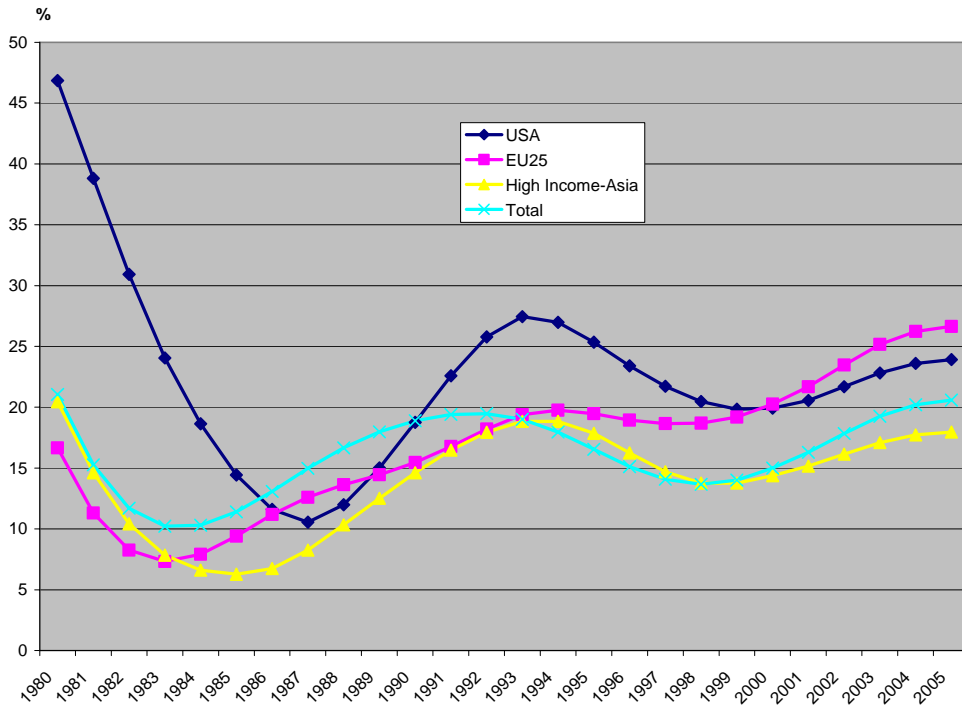


Fig. 6 - Growth patterns of China's Imports from High Income Countries, All Products, 1963-2005

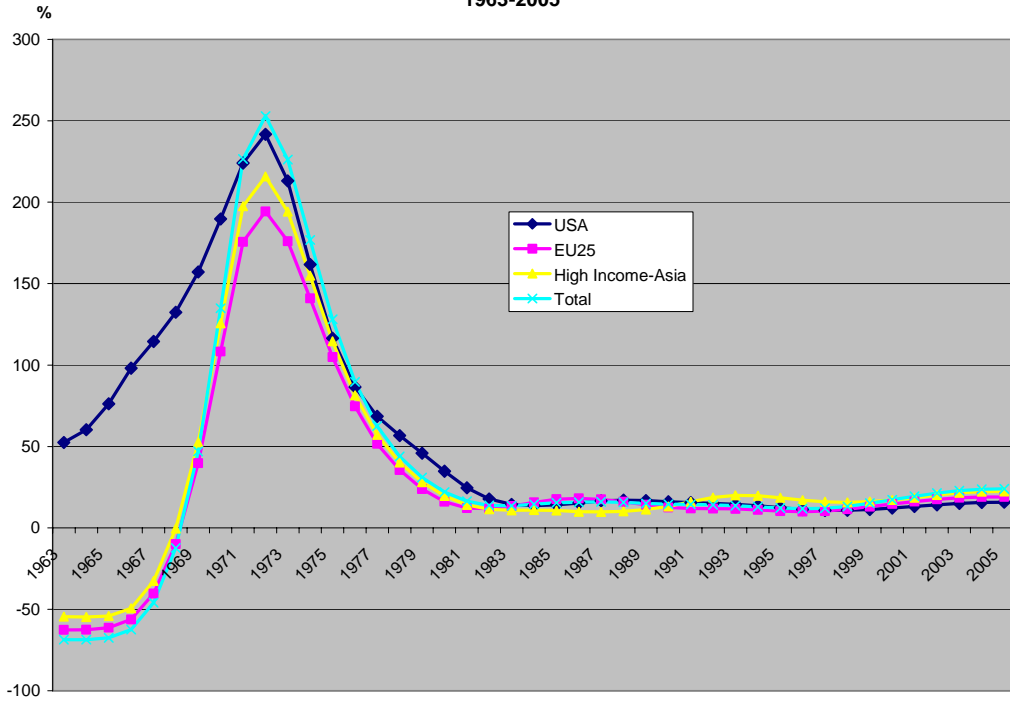


Fig. 7 - Growth patterns of China's Imports from High Income Countries, All Products, 1980-2005

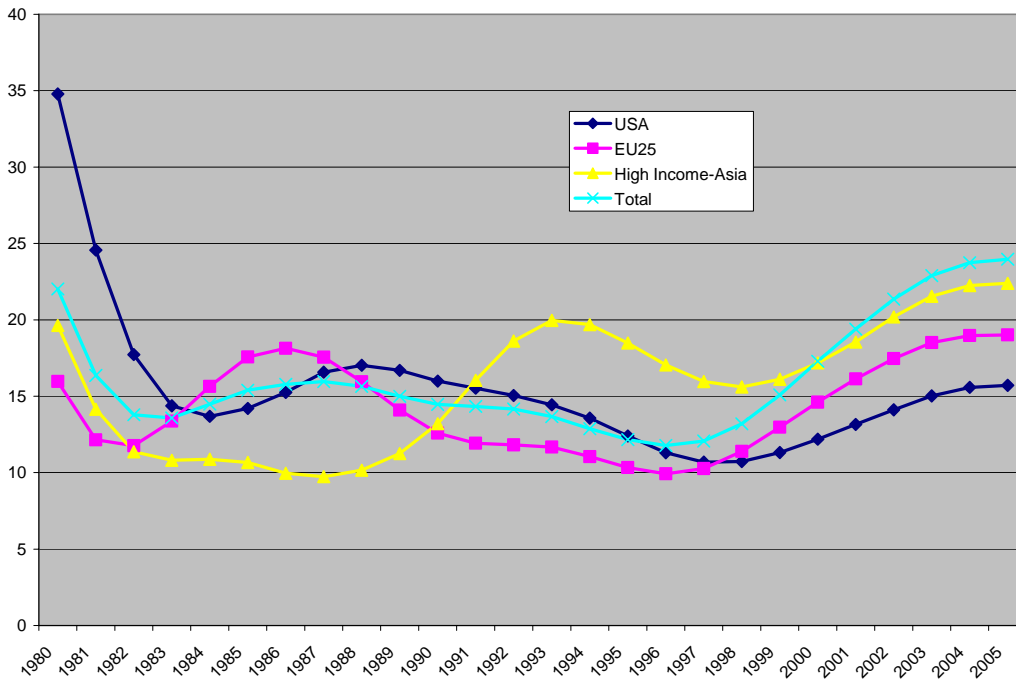


Fig. 8- Growth patterns of China's Trade Flow of Consumer Goods,1962- 2005

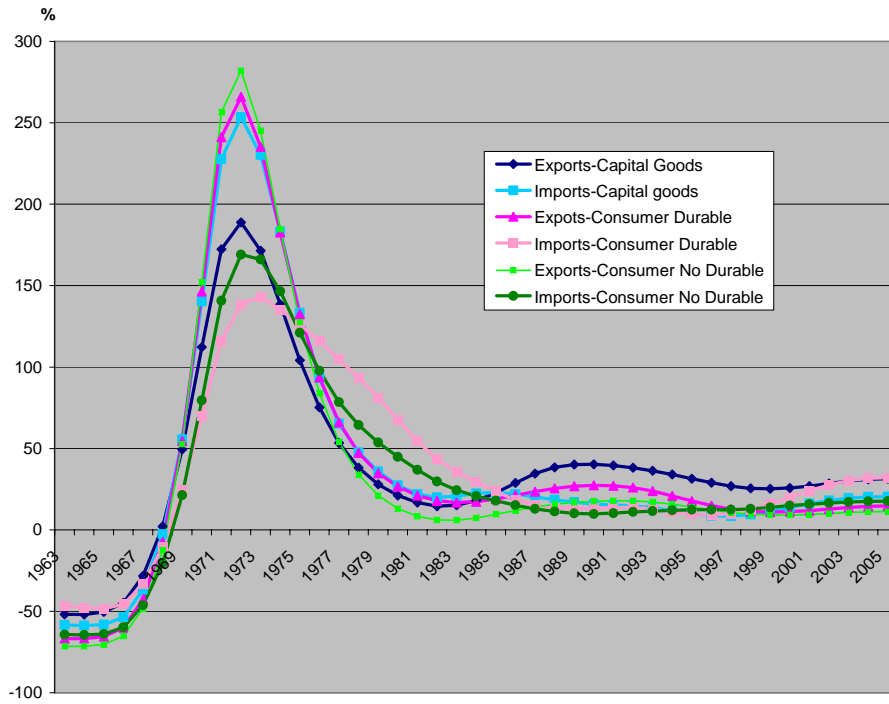


Fig. 9-Growth patterns of China's Trade Flow of Primary and Intermediate Goods,1962- 2005

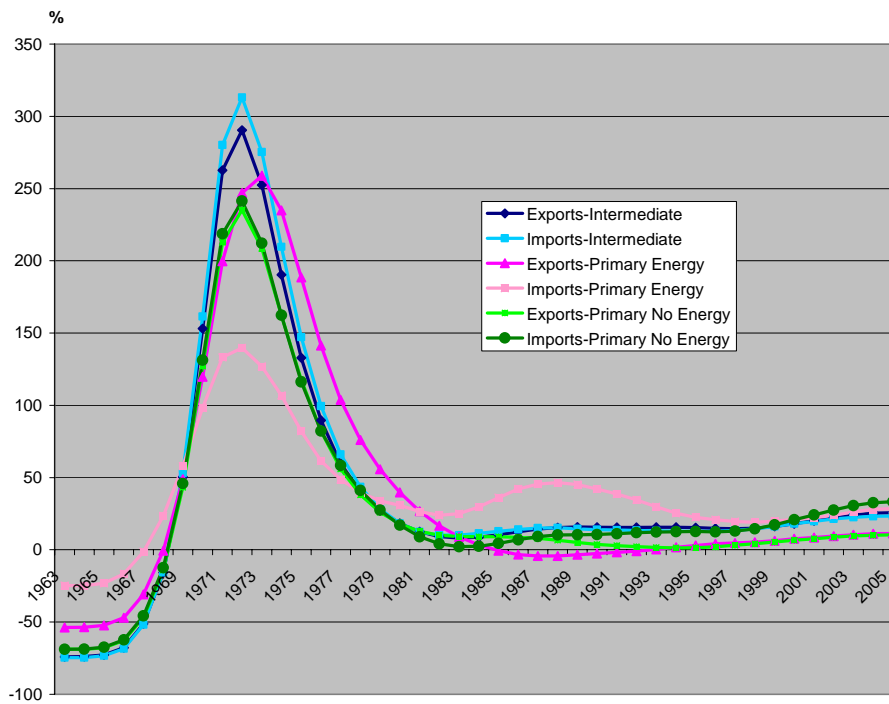


Fig. 10-Growth Pattern of China's Trade Flows of Consumer Durable Goods, 1963-2005

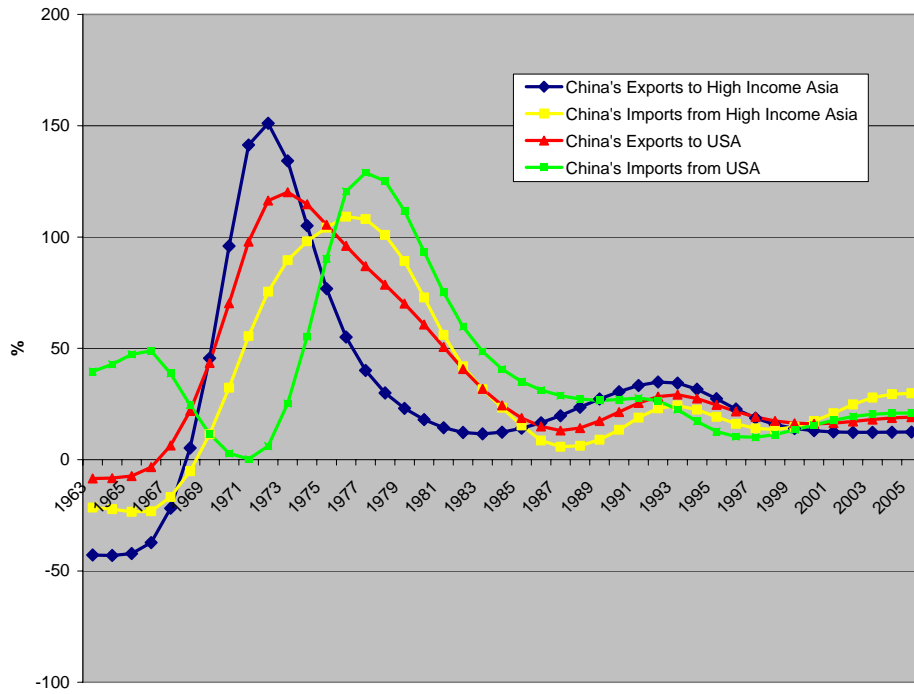


Fig. 11- Growth Pattern of China's Trade Flows of Capital Goods, 1963-2005

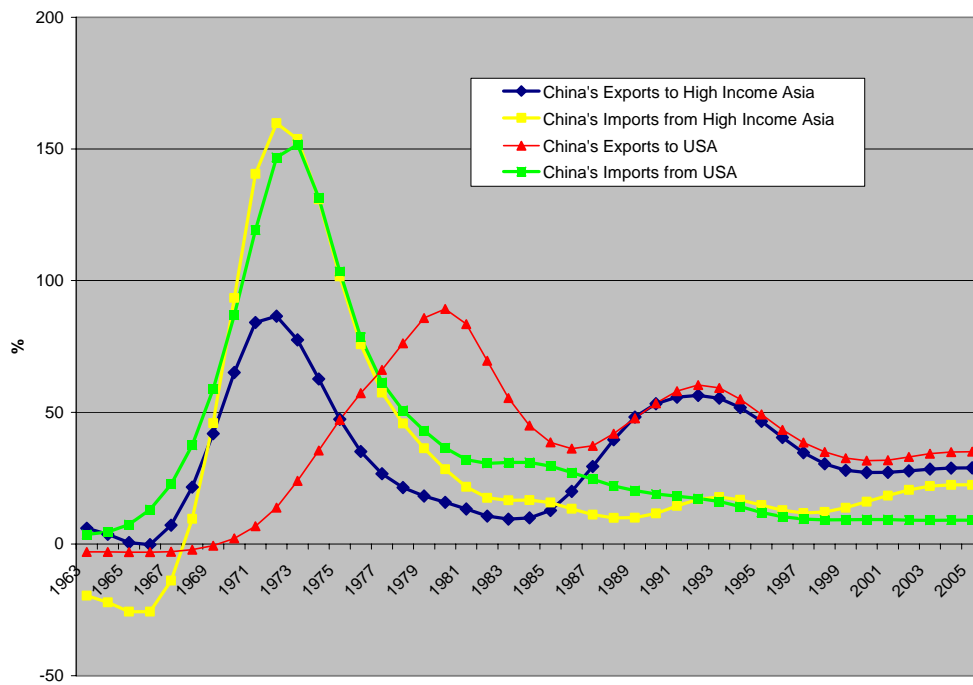


Fig. 12 - Growth Pattern of China's Trade Flows of Intermediate Goods, 1963-2005

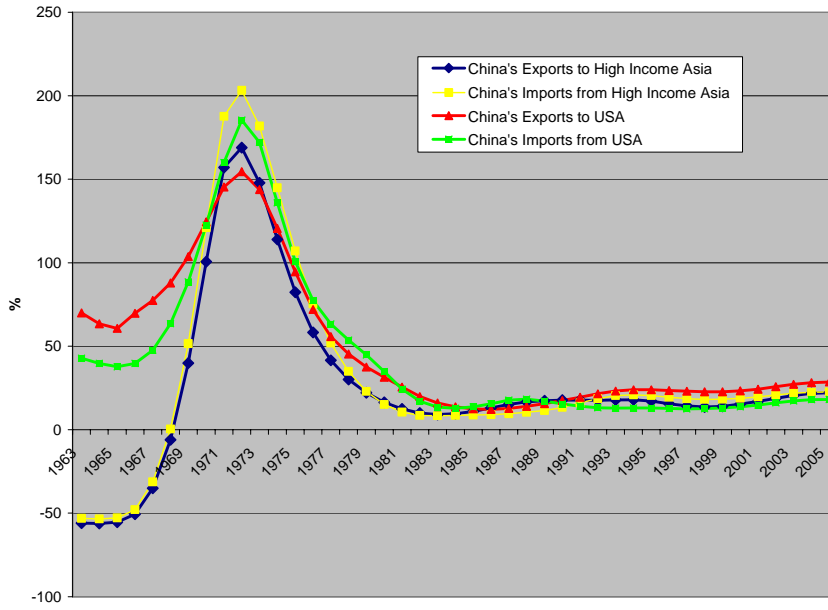


Fig. 13 - Growth Pattern of China's Trade Flows of Intermediate Goods, 1980-2005

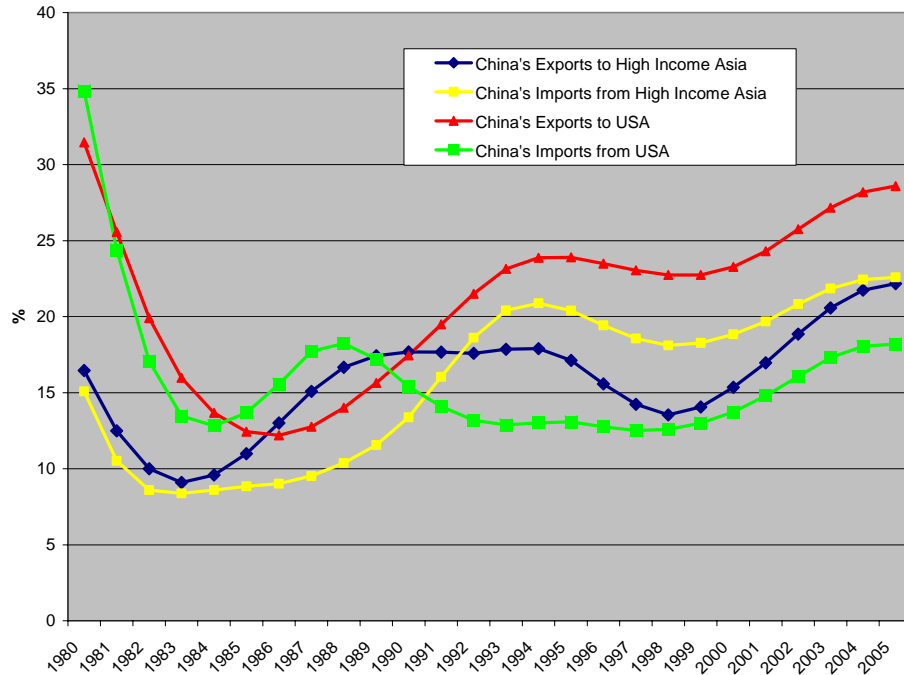


Fig. 14 - Growth Pattern of China's Trade Flows of Primary No Energy Goods, 1963-2005

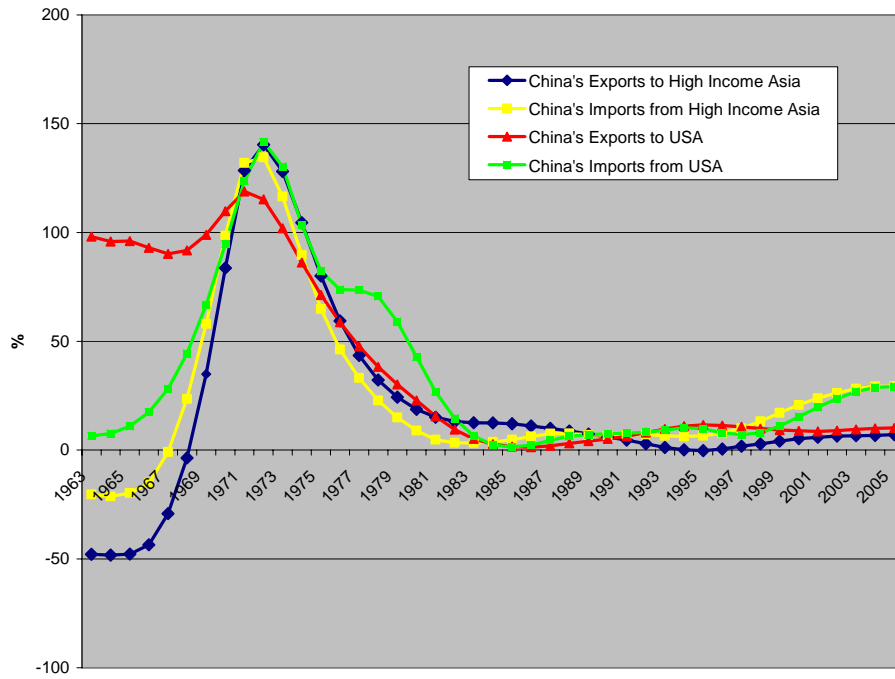


Fig. 15- Growth Pattern of China's Trade Flows of Primary Energy Goods, 1963-2005

