THE IMPACT OF CHINA'S GLOBAL ECONOMIC EXPANSION ON LATIN AMERICA. A Study of China´s Global Expansion on Mexico´s Economic Relationship with China: Heading for Conflict

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THE IMPACT OF CHINA'S GLOBAL ECONOMIC EXPANSION ON LATIN AMERICA

WORKING PAPER No. 4

A Study of the Impact of China's Global Expansion on Mexico
Mexico's Economic Relationship with China: Heading for conflict?

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Acronyms

AAGR	Average Annual Growth Rate
AMSDE	Mexican Association of Economic Secretaries
CANAINTEX	Cámara Nacional de la Industria Textil
EAP	economically active population
ECLAC	Economic Commission for Latin America and the Caribbean
ESI	Export-Similarity Index
FDI	foreign direct investment
GAN	High Level Group
GDE	global demand effect
GDP	gross domestic product
GTAP	Global Trade Analysis Project
GRUMA	Grupo Maseca
HTS	Harmonized Tariff System
IDB	Inter-American Development Bank
IMSS	Mexican Institute for Social Security
INEGI	Instituto Nacional de Estadística, Geografía e Información
NAFTA	North American Free Trade Agreement
NBTT	net barter terms of trade
OECD	Organisation for Economic Co-operation and Development
SDE	structural demand effect
SE	Secretary of the Economy
TIE	temporary import entries
UNAM	National Autonomous University of Mexico
USITC	United States International Trade Commission
WDI	World Bank World Development Indicators
WTA	World Trade Atlas

Introduction[1]

The People's Republic of China – hereafter referred to as China – has shown remarkable growth in recent decades from a socioeconomic and territorial perspective. In addition to achieving economic growth and bringing down poverty, Chinese socio-economic dynamism has been instrumental in the rise in international commodity and energy prices, new regional and international political and military alignments and the international financial system in its financing of the US fiscal deficit, among other issues. Thus, China's entry into the world market, along with various reforms implemented in the country since the end of the seventies and again during the 1990s, has gone beyond mere economic and trade-related changes.

China's rapid integration into the world market since its reforms at the end of the 1970s, and particularly since the 1990s, has not only affected industrialized countries: in Africa, Asia and Latin America substantial socioeconomic changes have occurred and some of them are associated with China's dynamism. This paper's objective is to study China's socioeconomic relationship with Mexico and in particular its more recent effects on Mexico's structure of production, trade specialization and structure and levels of employment. In the specific case of trade, both domestic and third markets are considered, including foreign direct investments (FDI) between both countries.

As a result the document is divided into five sections. The first section briefly analyzes the main growth, employment and trade patterns of Mexico. The second provides a literature review of Mexico's economic relationship with China, focusing on trade and investment analysis. The third examines the economic relationship between both countries in terms of bilateral investments and the main trade patterns between both countries with regard to Mexico's domestic market, as well as in its main export-market, i.e. the United States. The fourth section presents calculations regarding export-similarity indexes between both countries in the US market, shift-and-share analysis of both countries' exports to the US, and estimations of the effects of China's trade on Mexico's manufacturing employment. Finally, the fifth section concludes with the main issues of the document and present policy proposals.

1. Main growth, employment and trade patterns in Mexico

This section briefly analyzes some of the main structures that have emerged in Mexico's socioeconomy, particularly regarding its growth, employment and trade. It presents only an outline of each of these issues, in order to understand Mexico's socioeconomic relationship with China.

1.1. Growth and production

In the last 20 years, since the implementation of the liberalization strategy in 1988, Mexico has had significant difficulties in growing in terms of GDP and GDP per capita. While Mexico grew by more than 3% in both variables during 1940-1980, since 1988 its performance has been much more disappointing (see Table 1). Two issues stand out: a) Mexico's GDP per capita growth only represented almost 1/4 if comparing the periods 1960-1980 with 1980-2006, and b) China's and East Asia and the Pacific's GDP per capita performance for 1980-2006 has been 10 and 7.8 times higher than Mexico's. Even for the more recent period 2001-2006 China's GDP per capita performance was 7.3 times higher than Mexico's.

Table 1
Average annual growth rate of GDP per capita in selected countries (1960-2006)

	1960-1980	1980-2006	1990-2000	1990-2006	2001-2006
East Asia and Pacific	3.4	6.7	7.1	7.2	7.7
Argentina	1.8	0.5	3.3	2.8	2.7
Brazil	4.6	0.5	0.1	1.2	1.7
China	2.9	8.6	9.3	9.2	9.2
Latin America	2.9	0.7	1.6	1.6	1.7
Mexico	3.5	0.9	1.8	1.6	1.2

Source: Author, based on WDI (2007)

What are the reasons for Mexico's disappointing performance? At least five different reasons have been discussed recently:[2]

1. From the perspective of the public sector, since 2000 the failure to deepen the liberalization process in sectors such as petrochemicals, electricity, the pension system and the overall reforms of the public sector (PEF 2007, Sojo Garza Aldape 2005) have been the main cause of the slow growth process. Deepening the liberalization process since 1988 – in sectors such as petrochemicals, electricity, labor rights and foreign direct investments – would allow for better socioeconomic results.

2. In spite of Mexico's overall deregulation and opening in terms of trade and respective import tariffs, foreign direct investment, labor and an overall decreasing presence of the public sector – since the end of the 1980s, Mexico has generated important monopolistic structures in sectors such as telecommunications and the financial sector that have prevented a convergence with other industrialized countries (IMF 2006; WB 2007).

3. Mexico's GDP and GDP per capita growth performance have been below its historical and potential levels as a result of low investment growth. Mexico's exports have not led to increased investments, particularly in terms of technological

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[2] It is interesting that even former Presidents such as Salinas de Gortari have publicly acknowledged the limitations of trade openness (Salinas de Gortari 2004).

development, productivity spillovers and human capital formation. Large income disparities have deepened this problem (Moreno-Brid et. al. 2004; Ros 2007).

4. Mexico's engine of growth since the end of the 1980s, the export-oriented manufacturing sector, has been the cause of Mexico's increasing polarization process and the lack of linkages and growth: growth has been limited to an extremely small group of firms, households, branches, sectors and territories in Mexico and has lacked an overall "learning process" for the rest of the socioeconomy (Dussel Peters 2000). In addition, the export-oriented sectors and NAFTA have been challenged since 2001 by Asia and in particular by China in terms of system competitiveness, i.e. macroeconomic stability in Mexico has not resulted – at least so far – in a systemic competitiveness process at the micro, meso and macro levels, bringing into question even the more successful segments of Mexico's economy that have integrated with the US (Dussel Peters 2007).

5. In addition, Mexico's macroeconomy shows two important features: the lack of financing for the private sector and particularly for firms[3] and a continuous overvaluation of the exchange rate. According to official calculations the real exchange rate (based on a basket of foreign currencies and in which 1990=100) was overvalued by almost 25% in the mid- 2007, and at a similar level for most of the period 1990-2007, with the exception of the devaluation of 1994-1995 (Monitor de la Manufactura Mexicana 2007).[4] In contrast to Mexico's systematic overvaluation, countries such as China present a systematic undervaluation of at least around 10% (World Bank, 2007).

In addition to this lack of growth since the beginning of the liberalization strategy, Mexico's socioeconomy has gone through substantial changes. As shown in Table 2, the productive sector (the sum of agriculture, mining and manufacturing) is going through a substantial crisis: its share of total GDP fell from 34.7% in 1988 to 23.5% in 2006. This drastic process has been particularly profound for manufacturing, which over the same period saw its share of total GDP decline by almost 6%. This process contradicted initial expectations of NAFTA in the context of closing the gaps between Mexico and the United States in terms of GDP, employment, productivity and wages, particularly in Mexico's manufacturing sector.

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[3] In 2007 financing from commercial banks to private firms relative to GDP accounted for only 20% of the ratio in 1995.
[4] Strictly in terms of real exchange rates the topic becomes much more complex for Mexico when comparing the performance with China and its undervaluation, in spite of its recent devaluations since 2005-2006.

Table 2
GDP by selected sectors of Mexico's economy (1988-2006)
(Share over total GDP)

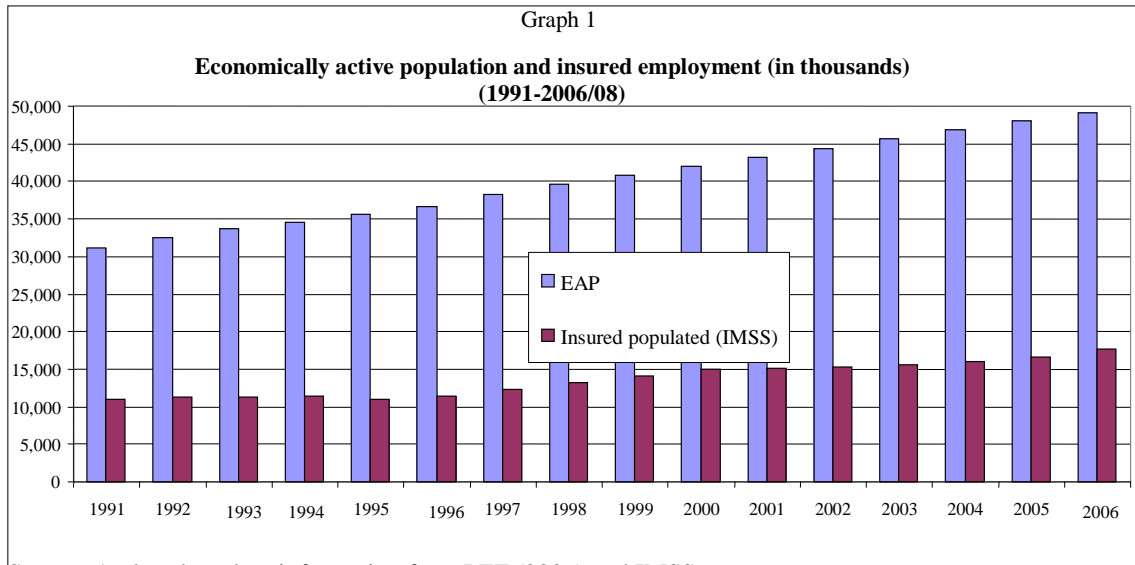|	Agriculture	Mining	Manufacturing	Commerce and Restaurants	Financial Services	Communal, Social and Personal Services
1988	7.90	2.95	23.86	25.35	9.7	17.01
1994	5.97	1.33	18.71	21.05	16.15	23.75
2000	4.17	1.41	20.31	21.36	12.14	24.38
2001	4.15	1.38	19.56	20.68	12.17	26.17
2002	3.94	1.35	18.62	20.02	13.40	26.97
2003	3.89	1.32	17.97	20.34	13.19	27.66
2004	3.91	1.45	18.04	20.80	12.98	26.76
2005	3.83	1.50	17.79	21.16	13.10	26.60
2006	3.87	1.57	18.04	21.18	12.95	25.97
2007/01	3.81	1.59	18.01	20.06	13.23	26.89
2007/02	4.07	1.61	18.10	20.99	12.98	26.12

Source: Author, based on information from INEGI (2007).

1.2. Employment

Parallel to weak GDP growth the performance in employment since the end of the 1980s was similarly disappointing. Four topics are significant: understanding why Mexico's open unemployment rate is so low compared with other nations; the relevance of Mexico's growing economically active population (EAP); the lack of formal employment generation; and recent trends in the quality of employment generated (Berg et. al 2006; Monitor de la Manufactura Mexicana 2007).

First, Mexico's open unemployment rate reached its highest levels since the 1990s in 2005 with levels slightly above 4%, and has since declined to around 3%. The definition of the open unemployment rate in Mexico (as used in OECD countries) refers to the percentage of the EAP that has not worked for more than an hour a week during the last two months and that is still searching for a job. Under Mexico's socioeconomic conditions, without no unemployment benefit system this definition is not useful. It is rather surprising to find any unemployment at all under this definition.

Second, until mid-2007 Mexico's economy experienced great difficulty in generating formal employment: for the period 1991-2007 it generated an average of less then 350,000 jobs annually while EAP increased by around 1 million, i.e. 32.4% of the annual growth of the EAP got a formal job, while the rest was not necessarily unemployed (as defined by the open unemployment rate) but rather had to either search for a job in the informal sector or migrate to the US (see Graph 1). These tendencies reflect the massive challenges of Mexico's socioeconomy and in particular the ones that have risen since the late 1980s when the economy has faced problems in growing.

Graph 1

Economically active population and insured employment (in thousands)
(1991-2006/08)

Source: Author, based on information from PEF (2006) and IMSS

Third, although formal employment, (i.e. employment registered with the Mexican Institute for Social Security (IMSS)) has grown at over 5% since 2005. Most of this employment has been generated in construction and services, while the productive sector (agriculture, mining and manufacturing) is still below the absolute employment levels of 2000. In the case of manufacturing, for example, formal employment in October of 2007 was still 11% below levels reached in 2000.

Fourth, the quality of the formal employment created has deteriorated substantially since the 1980s in several respects. On the one hand, real minimum wages in 2006 represented less than 30% of their 1980 level, i.e. there has been a real wage loss for this segment of the labor market of around 70%, while manufacturing has lost 15% in this period. In addition, formally generated employment insured at IMSS has changed substantially: while formal generation has increased since 2005, most of the new employment has been temporary, i.e. until the end of the 1990s less than 10% of total employment was temporary, while since 2004 53% of new employment registered under IMSS was temporary, i.e. the quality of new employment has worsened significantly.

1.3. Trade

At least three issues are relevant to understanding Mexico's foreign trade: its increasing significance in Mexico's economy in terms of the strategy implemented since the end of the 1980s; the increasing concentration of Mexico's trade and exports in terms of firms, branches, sectors and territories; and, finally, the role of temporary imports used in exports from Mexico's most dynamic growth sectors.

Graph 2 reflects the growing importance of exports as the main engine of growth for the Mexican economy since the 1980s. As in other countries and regions, exports of goods and services have increased substantially as a share of GDP from levels close to 10% to levels above 30% since 2000. From this perspective, export growth is significant for Mexico's

socioeconomy. As discussed in the next section, the concentration on exports to the US plays a substantial role in the context of NAFTA implemented since 1994.

Secondly, Mexico's exports are highly concentrated in terms of firms, branches, sectors and territories. It has been shown (Dussel Peters 2000) that around 3,500 firms or 0.01% of all firms account for more than 94% of Mexican exports, while representing less than 6% of Mexico's formal employment. In addition, the five main chapters of Mexican exports in 2006 – autoparts, electronics, automobiles, oil and optical instruments and equipment – accounted for 73% of total exports (see next section).

Graph 2
Exports of goods and services / GDP (1980-2005)
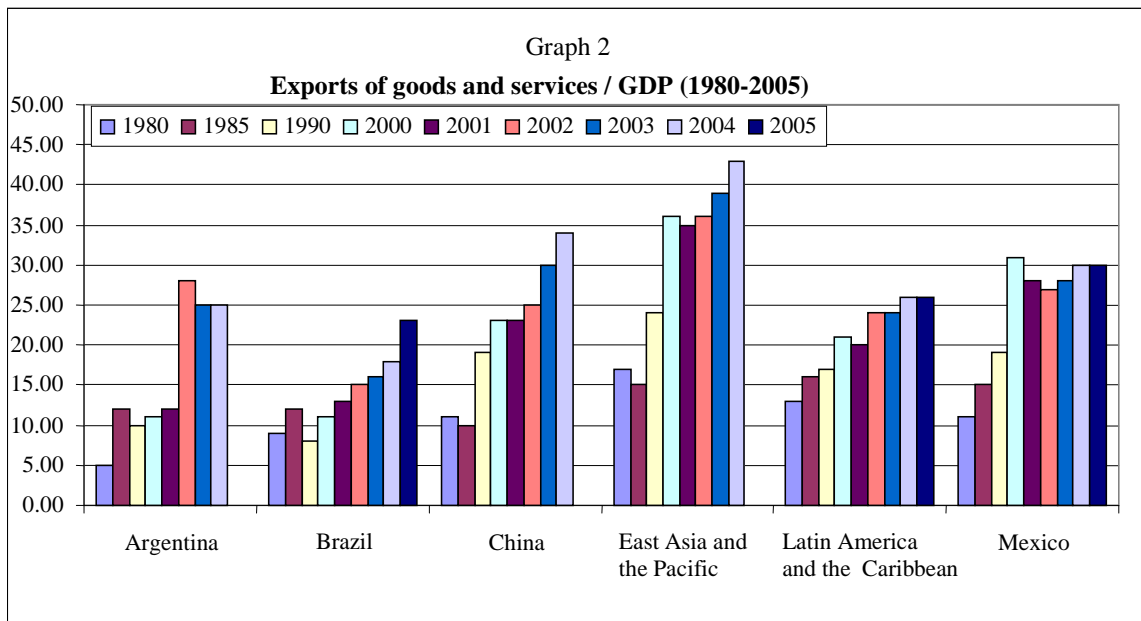
Source: Author, based on World Bank (2007).

Third, it is relevant to understand that Mexico has specialized in industries that depend on temporary import entries (TIEs), which accounted for 76% of total exports in 1993-2006, and in oil, which accounted for another 15% in the same period Both processes are characterized by low value-added with little integration to the rest of the economy.

Graph 3
Structure of exports by program (1993-2006) (share over total exports)
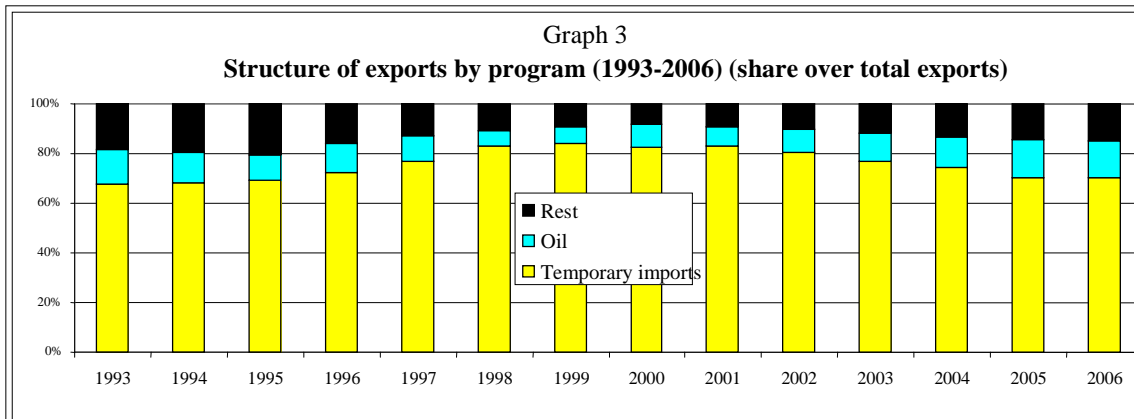
Source: Author, based on information from Bancomext (WTA)

2. A brief review of the literature on the relationship between Mexico and China

Studies on the socioeconomic and trade relationship between China and Mexico are still fairly new in Mexico, unlike the extensive existing bibliography on the bilateral relationship between China and the United States or the US and Mexico. In Mexico there are two main types of studies and periods on the topic:

- Before 2003, when the subject received minimal attention. Most of the studies were realized by trade negotiators (De la Calle 2002) or were of a very general nature, for the most part "explaining" China in Mexico (Cornejo 1985; González García 2003)[5] and from a more historical, sociological and diplomatic perspective.

- Since 2004, a number of more in-depth studies have been carried out on the bilateral relationship with China from several angles:

  o More detailed statistical information has become available on foreign direct investment (SE 2005). Although it is still very early, in 2005 339 companies were registered with Chinese capital, which represented 1.1% of foreign companies in Mexico. In addition, Chinese FDI between 1999 and 2005 was 41 million dollars, or 1.2% of the FDI of Asian countries: 52.7% was concentrated in manufacturing and 24.4% in services.[6] There are currently no estimates on the employment generated by this activity.

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[5] Research by authors such as Eugenio Anguiano, Flora Botton and Romer Cornejo, of the Centro de Estudios de Asia y África of the Colegio de México has been significant. Other authors such as Gómez Izquierdo (1992) have also discussed the historical dimensions of Chinese population in Mexico. The contribution of Watkins (2002) is notable, presenting a timely commercial study of competition between China and Mexico in the US market.

[6] FDI-data until 2007 has not changed substantially, i.e. Chinese FDI in Mexico accumulated $63 million for 1999-2007 (http://www.economia.gob.mx/?P=2261).

- o With a few exceptions in various sectors (CANAINTEX, 2007; CNIV, 2007), the private sector in Mexico has generated little comprehensive data on the economic effects of China on Mexico.[7]

- o International organizations such as the Economic Commission for Latin America and the Caribbean (ECLAC) (2004) and the IDB (2005) as well as several academic studies have presented initial, more detailed analyses of the economic effects of China in Latin America and, to a smaller degree, to Mexico. In general terms, both studies examine data on bilateral trade. Just as in other general studies on the textile/clothing manufacturing chain, based on the Global Trade Analysis Project (GTAP), Mexico is the country that is the most affected, and the biggest loser, in the US market from China's trade expansion because it has a similar export structure to China (Domínguez 2006; López Córdoba, Micco and Molina 2005).[8]

- o More recently, several studies (Pescador Castañeda 2004; Cornejo 2005; Dussel Peters 2005a, 2005b, 2007; Correa López and González García 2006; Oropeza García 2006; Villarreal and Villeda 2006; Cárdenas Castro and Dussel Peters 2007; Feenstra and Kee 2007; Trápaga Delfín and Dussel Peters 2007) have begun to analyze in greater detail the bilateral relationship, including bilateral sectorial research, for example on the textile/clothing manufacturing chain and the electronic sector. In this latter sector, Mexico lost more than 45,000 jobs between 2001 and 2003, US$3.2 billion in exports and US$500 M in FDI to Asia and particularly to China (Dussel Peters, 2005a). These studies have begun with the analysis of business opportunities in China. Faced with the significant increase in its imports, Mexico's competitiveness with respect to China and the consequences in general have been negative, both in the Mexican domestic market and in the US market. These studies calculate significant shifts in Mexican production.[9]

Despite this expanding recent literature, the level of analysis and detailed knowledge about the impact of China on Mexico has so far been relatively limited, particularly considering that China became Mexico's second trade partner in 2003. Until the end of 2007, with the exception of the Center for Chinese-Mexican Studies at the National Autonomous University of Mexico (UNAM), no single institution in the public, private or academic sectors has specialized in socioeconomic analysis of China in Mexico. Thus, in general it has been extremely difficult to get beyond the discussion of "opportunities and threats" and "doing business in China".

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[7] An interesting exception is the work of Luna Martínez (2003), who tried to highlight potential possibilities and threats in the bilateral relationship in the US market and in particular sectors.

[8] A number of publications of Sanjaya Lall (including Lall and Weiss 2005) have been very fruitful in pointing out the competition between Latin America and China at the sectorial level.

[9] The broader analysis of Garza Limón, is clear in this respect: "…we arrived late on the scene and are doing badly in the Chinese market…we cannot continue to have…defensive or restrictive policies with China, nor continue to make accusations of disloyal trade and human rights violations merely a pretext to justify inefficiency." (Garza Limón, 2005: 29)

3. The economic bilateral relationship and existing bilateral institutions

This first part of this section examines the economic relationship between both countries in terms of bilateral investments and the main trade patterns, as well as in Mexico's main export-market, i.e. the United States. The second part outlines the main bilateral institutions and projects related to trade.

3.1. The bilateral economic relationship

Some of the difficulties which account for the lack of analysis and knowledge of the bilateral relationship arise from problems in trade and investment statistics. In the case of investments for example, cumulative Chinese FDI in Mexico came to $63 M during 1999-2007 according to official statistics from the Secretaría de Economía, while our own research puts the level around 10 times higher. In trade statistics there are differences of 277% between Chinese exports to Mexico and Mexican imports from China in 2006 (Graph 4). In spite of the efforts of bilateral institutions (see section 3.2.) these issues remained unresolved at the end of 2007. As a result, it is important to bear in mind the respective data sources in the case of trade, whether Mexican (Bancomext 2007) or Chinese (CCS 2007).

Graph 4

China and Mexico: Differences in trade statistics (1995-2006)
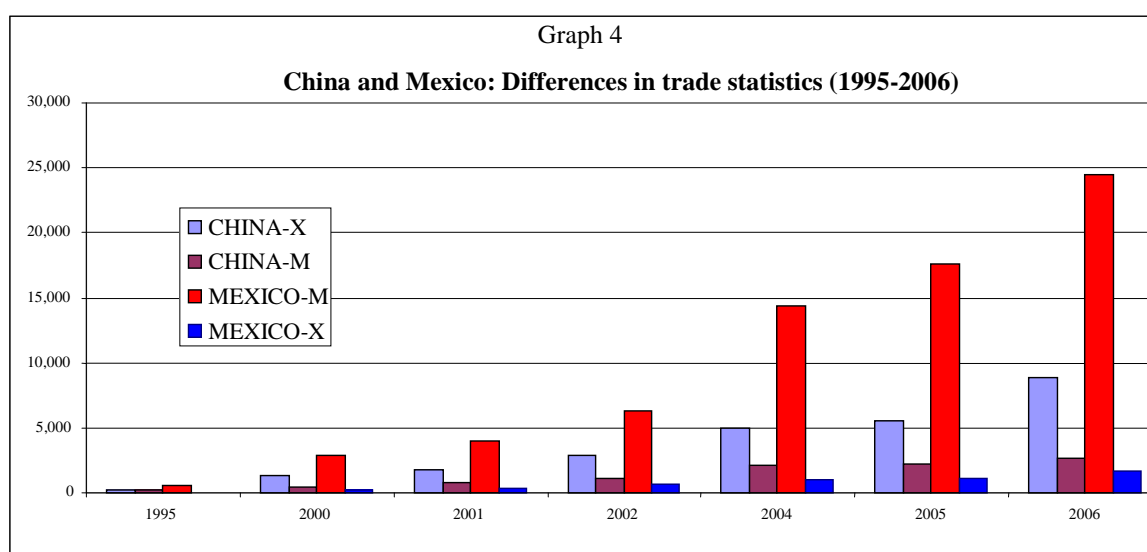
Source: Author, based on information from Bancomext (2007) and CCS (2007)

Table 3 shows bilateral FDI. Taking into account important statistical limitations, the table shows at least two interesting patterns. On the one hand, China's accumulated FDI in Mexico is substantially higher then Mexico's in China up to 2007, in a ratio of around 7:1; from a Mexican perspective China's FDI is still relatively small and accounts for less then

0.4% of Mexico's total FDI during 1994-2007.[10] In addition, bilateral FDI shows an interesting specialization pattern: while China's investments in Mexico have focused on manufacturing and increasingly on the automobile autopart and electronic chains, Mexico's FDI almost exclusively concentrated in food, led by Grupo Maseca (GRUMA) and Bimbo (Dussel Peters, 2007).

Table 3
Foreign direct investment between China and Mexico (up to 2007)

	FDI (in US$ M)	Activity
FDI by Chinese firms in Mexico[a]		
Information from Secretaria de Economia [b]	63	
Additional information up to 2007:		
Giant Motors	18	Automobiles, trucks
Sinatex	96	Textiles, garments
ZX and Chamco Auto*	400	Automobiles, trucks
Konka	10	Televisions
TCL (acquisition of Thomson)	100	Televisions and others
Other	Around 35	
TOTAL	722	
FDI by Mexican firms in China[a]		
Gruma	100	Food
Bimbo	11.30	Food
Other	Around 2	
TOTAL	113	

a: In some cases investments will be implemented in the next years.
b: Accumulated until the first semester of 2007 for the period 1999-2007.
* This investment was announced at the beginning of 2007, but will apparently not take place
Source: Author, based on information from SE (2007) and own information from press.

Bearing in mind the problems of trade data (Dussel Peters 2005b), what are the main trade patterns between Mexico and China, both bilaterally and in the US?

Based on Mexican statistics, China has become Mexico's second trading partner since 2003[11] after the United States.[12]   Table 4 (p. 16) shows some of the general characteristics of bilateral trade:

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[10] Until mid-2007 the investment of ZX and Chamco Auto was still being discussed in the news. However, by November 2007, this investment had been postponed indefinitely. Independently of the specific investment, China's FDI is still much bigger than Mexico's in China.

[11] In 2006 trade with China represented 9.5% of Mexico's total imports and 0.7% of its exports, comprising 5.2% of Mexico's total trade.

[12] On the other hand, based on Chinese statistics Mexico was China's 22nd and 35th trading partner in 2004 in terms of exports and imports, respectively.

- In general, the period 1993-2006 can be divided into two sub-periods: a) 1993-2000, in which total Mexican exports grew at an average annual growth rate (AAGR) of 19.3% and, b) 2000-2006, with an AAGR of only 7%.

- Mexico's trade structure reflects a high degree of concentration, especially of exports. Since 2000, Mexican exports to the US represented more than 88% of the total, i.e. for Mexico exports to the NAFTA-region (Canada and the US) predominate. No other destination accounts for more than 2% of Mexican exports.

- With the exception of Aruba, Mexican exports to China are the most dynamic during 1995-2006, with an AAGR of 41.5%; i.e. China has become an increasingly important export-market and the 6th largest in 2006. This performance, however, changes significantly if we consider Hong Kong and China as one entity: the AAGR falls to 12.5% for 1995-2006, since exports to Hong Kong in 1995 already accounted for more than $US500 M, while exports to China were less than $US 40 M.[13]

- Mexican imports from China have been even more dynamic, with an AAGR of 41.9% during 1995-2006; if we include Hong Kong, imports account for an AAGR of 38.8%. Mexican imports, however, show a very different structure from exports: since the implementation of NAFTA in 1994 the share of imports from the US has declined substantially, accounting for 50.92% in 2006, while imports from Asia, and particularly China, Japan, Korea, Taiwan and Malaysia have increased and substituted for US imports, accounting together for around 30% of Mexican imports in 2006 (Monitor de la Manufactura Mexicana 2007).

- In 2006 the ratio of Mexican imports from China relative to Mexican exports to China was 15:1 and China was the country with which Mexico had the largest trade deficit (of more than $22 billion).

- Mexico's trade structure (see Table 4) reflects a high degree of integration with the US economy. The US is the only trading partner with which Mexico has a trade surplus, which increased from $3 billion in 1993 to more than $80 billion in 2006. Thus, the US market is of major importance for Mexico, not only as its main trading partner but also since it is the main and only major trading partner with which it achieves a surplus.

Table 5 (p.17) allows for a deeper understanding of bilateral trade between Mexico and China for 1993-2006, in particular:[14]

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[13] The topic requires more detailed analysis in the future, but it stands out that Mexican exports to Hong Kong have fallen continuously, with an AAGR of -8.4%. During the period exports to Hong Kong have not played an important role and have been shipped directly to China (and not through Hong Kong).

[14] Tables 4 and 5 present trade statistics for Hong Kong and China as well as for China alone. Mexico's trade with Hong Kong plays a minor role – 0.12% and 1.25% of Mexican exports and imports in 2006, respectively – but will require a more detailed analysis in the future, in particular for understanding the final destination of Mexican exports and the effective source of these imports to Mexico. Trade with Hong Kong, however, does not change bilateral and disaggregated trade patterns between China and Mexico.

- Mexico's exports are highly concentrated in a small group of chapters with the top five accounting for 72.47% of total exports and 59.30% of imports in 2006. This concentration is even higher in the case of Mexican exports to the US, the main motor of growth of Mexico's economy since the end of the 1980s.

- In general, Mexican exports show a strong similarity with those of China, since electronics and autoparts are the largest and fastest growing chapters of the Harmonized Tariff System (HTS) in both countries. Both chapters account for more than 35% of Mexican exports in 2006. The main differences in exports between the countries, however, are that Mexico exports automobiles – accounting for 15.77% of total Mexican exports (or US$39.5 billion) – while they only account for 2.31% of China's exports (or $22.4 billion) in 2006.

- Mexico's trade structure is, rather surprisingly, relatively similar to China's, i.e. it imports and exports in similar chapters: it exports electronics, autoparts, automobiles and oil and imports under the same chapters.[15]

- It is important to emphasize that Mexico has had a trade deficit with China in primary products (chapters 1-25 of the HTS) since 1995 despite China's high demand in these chapters. Thus, it is important to understand these trade patterns and Mexico's overall limitations ini exporting agricultural and agroindustrial goods to China.

- Table 5 illustrates the main features of bilateral trade between China and Mexico. On the one hand, an increasing diversification of Mexican exports to China (at the chapter level): while electronics, autoparts and automobiles accounted for more than 60% of Mexican exports until 2004 (Dussel Peters 2005a), Mexican exports to China have since shifted substantially. In 2006 the main export chapter was copper, and exports from the autoparts-automobile commodity chain only accounted for 35.70%.[16] Thus, Mexico's exports to China show an increasing Latin Americanization, i.e. raw materials have been the most dynamic chapters to be exported to China in the most recent years.

- Mexican exports – as well as Chinese – depend heavily on imported inputs to be re-exported, as discussed in the last section: in the case of total exports, 75% of Mexican exports during 2001-2006 depended on these programs; in the case of exports to China they fell from 95.5% in 1999 to 39.5% in 2006.

Tables 6a and 6b deepen the specific trade between Hong Kong and China and Mexico (and is based on Mexico's statistics). Three topics are significant.

On the one hand, the dramatic growth of Mexican copper exports (in very different forms from waste and scrap to refined copper and copper mattes, among others), considering that they just started in 2005-2006. Similarly exports of aluminum, iron ores and cotton, among

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[15] The topic refers to the issue of intraindustry trade. Mexico accounts for an intraindustry trade coefficient with the US of above 50% until the end of the 1990s and a tendency to fall since then, while the same coefficient is below 5% with China (León Pacheco and Dussel Peters 2006).

[16] This is the only case in which Hong Kong's trade makes a difference, i.e. autoparts would still be Mexico's main export chapter to Hong Kong and China in 2006 (and before copper) (see table 5).

other raw materials, are becoming the main export products to China and Hong Kong and explain the sudden growth in the share of the main 20 4-digit items that Mexico exports to Hong Kong and China, increasing their share of total Mexican exports from 51% in 2004 to 76% in 2006. Within these 20 main 4-digit items, those related to raw materials increased from $104 million in 2004 to $744 in 2006 and accounted for 37.76% of total Mexican exports to Hong Kong and China.[17]

Second, the detailed 4-digit analysis shows that bilateral trade is extremely dynamic, with growth rates above 1,000% during 2004-2006 in several cases; total exports and imports increased by 161% and 68% respectively in these two years.

Third, Table 6b permits a greater understanding of Mexican imports from China and Hong Kong for the main 4-digit items: most of them are closely related to the electronics (telecommunications and PCs) chains, irrespective of their specific position within chapters of the Harmonized Tariff System: data processing machines and their parts and components (several items under 8471 and 8473, but also 8542, 8534, 9013 and 8541), television parts and radios and video equipment (items 8529, 8504, 8518, 8544, 8521 and 8414). Toys and autoparts also account for an increasing share of Mexico's imports from China and include some of the most dynamic 4-digit imports from China.[18] The topic will be discussed in detail for the electronics sector in Jalisco. In addition, Graph 5 shows that Mexican imports from China and Hong Kong are not only growing but are also changing their structure: the share of definitive imports (i.e. those for consumption in Mexico according to their tariff treatment) has fallen from 55.4% in 1995 to levels below 40% since 2004. Thus, these imports are increasingly being used for exports.[19]

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[17] From this perspective, Mexican exports to China seem to be in a transition from manufacturing to raw materials and are currently relatively diversified, both in terms of the wide variety of products exported and also very probably in terms of firms. However, it has not been possible to link exports at the 4 and 6-digit level with respective firms in Mexico.

[18] The autoparts-automobile chain will be probably one of the most important chains for future competition and cooperation between China and Mexico, both in the domestic and the US markets, although little analysis has been done so far on the topic. For an initial analysis, see Dussel Peters (2007) and Alvarez Medina (2007).

[19] Current trade data do not allow for a more in depth analysis, i.e. to investigate whether these imports are substituting for imports from other countries, particularly the United States, and whether, further, these imports are caused by intrafirm decisions or by interfirm competition. The next chapter elucidates some of these topics for the specific case of electronics.

Graph 5

Mexican imports from China and Hong Kong by type (1995-2006) (percentage over total)
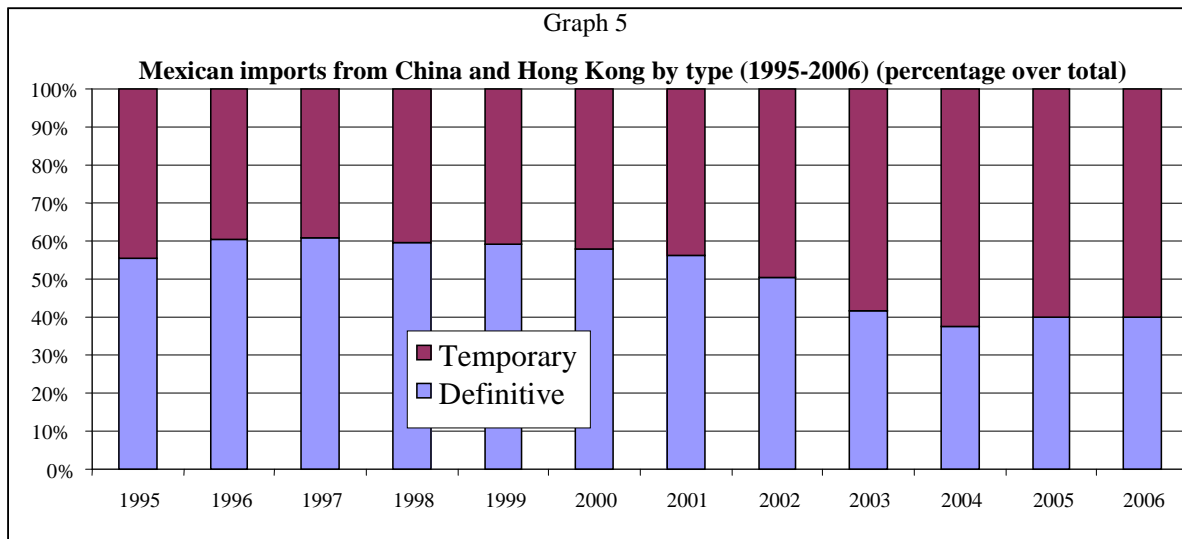
Source: Author, based on information from Bancomext (2007)

In addition to the already mentioned sectorial studies of the bilateral relationship – in particular in the electronics and yarn-textile-garment chains – two issues have been of concern: a) the increasing illegal import of Chinese goods and, b) the "triangulation" of Chinese goods.

The private sector has been publicly outspoken in relation to the first topic: in the yarn-textile-garment chain, for example, trade associations estimate that up to 65% of domestic consumption is being imported illegally, particularly from China (CANAINTEX 2007; Zaga Kalach 2007).[20] Another form of illegal trade, known as "technical smuggling", refers to the possibility of defining goods under the wrong 6 or 8-digit label of the HTS, for example classifying new clothes as used.[21]

Massive "triangulation" of Chinese goods through US ports, mainly through Long Beach, is also increasingly being acknowledged by US public institutions (USGAO 2004), i.e. Chinese goods enter as temporary imports to the US and are being exported to Mexico, now under the label "*made in USA*". It has not been possible to quantify the dimension of this kind of irregular trade.

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[20] Other goods such as steel and watering cans are also discussed as being imported illegally on a massive scale. In the latter case it is estimated that 80% are imported illegally (*Reforma*, July 23, 2007) (not in bib).

[21] There is little detailed information on the topic. The Secretaría de Economía, however, established that imports of rags and used cloths increased from 6,500 to 17,500 tons during 2003-2005 (*Reforma*, January 6, 2006) (not in bib).

Table 4
Mexico: Main Trading Partners (1993-2006)

EXPORTS

$US millions

#	Country	1993	1995	2000	2004	2005	2006	1995-2006
1	United States	42,851	66,273	147,686	167,455	183,437	212,285	--
2	Canada	1,569	1,987	3,353	2,796	4,232	5,183	--
3	Spain	918	797	1,520	2,016	2,880	3,280	--
4	Germany	430	515	1,544	1,926	2,290	2,975	--
5	Colombia	239	453	462	625	1,545	2,133	--
	China and Hong Kong	140	541	391	754	1,326	1,971	
6	China	45	37	204	474	1,134	1,690	--
7	Japan	686	979	931	553	1,476	1,604	--
8	Aruba	18	31	15	1,374	1,447	1,469	--
9	Holland	193	177	439	559	801	1,334	--
10	Brazil	292	800	517	574	890	1,148	--
11	Guatemala	204	310	535	602	864	935	--
12	United King and Ireland	202	481	870	775	1,186	927	--
13	India	10	25	60	454	522	671	--
14	Switzerland	141	608	553	780	117	95	--
15	Dutch Antilles	32	59	871	11	11	31	--
	Subtotal	47,969	74,075	159,949	181,729	204,159	237,733	--
	Rest	3,863	5,465	6,506	7,472	9,835	12,728	--
	Total	51,832	79,541	166,455	189,200	213,995	250,461	--

Share (percentage over total)

#	Country	1993	1995	2000	2004	2005	2006	1995-2006
1	United States	82.67	83.32	88.72	88.51	85.72	84.76	--
2	Canada	3.03	2.50	2.01	1.48	1.98	2.07	--
3	Spain	1.77	1.00	0.91	1.07	1.35	1.31	--
4	Germany	0.83	0.65	0.93	1.02	1.07	1.19	--
5	Colombia	0.46	0.57	0.28	0.33	0.72	0.85	--
	China and Hong Kong	0.27	0.68	0.23	0.40	0.62	0.79	--
6	China	0.09	0.05	0.12	0.25	0.53	0.67	--
7	Japan	1.32	1.23	0.56	0.29	0.69	0.64	--
8	Aruba	0.03	0.04	0.01	0.73	0.68	0.59	--
9	Holland	0.37	0.22	0.26	0.30	0.37	0.53	--
10	Brazil	0.56	1.01	0.31	0.30	0.42	0.46	--
11	Guatemala	0.39	0.39	0.32	0.32	0.40	0.37	--
12	United King and Ireland	0.39	0.60	0.52	0.41	0.55	0.37	--
13	India	0.02	0.03	0.04	0.24	0.24	0.27	--
14	Switzerland	0.27	0.76	0.33	0.41	0.05	0.04	--
15	Dutch Antilles	0.06	0.07	0.52	0.01	0.01	0.01	--
	Subtotal	92.55	93.13	96.09	96.05	95.40	94.92	--
	Rest	7.45	6.87	3.91	3.95	4.60	5.08	--
	Total	100.00	100.00	100.00	100.00	100.00	100.00	

Growth rate

#	Country	1993	1995	2000	2004	2005	2006	1995-2006
1	United States	--	24.4	17.4	3.2	9.5	15.7	11.2
2	Canada	--	12.6	11.0	-4.4	51.4	22.5	9.1
3	Spain	--	-6.8	13.8	7.3	42.8	13.9	13.7
4	Germany	--	9.4	24.5	5.7	18.9	29.9	17.3
5	Colombia	--	37.8	0.4	7.8	147.4	38.1	15.1
	China and Hong Kong	--	96.3	-6.3	17.9	75.8	48.7	12.5
6	China	--	-9.1	40.6	23.5	139.1	49.0	41.5
7	Japan	--	19.4	-1.0	-12.2	166.8	8.7	4.6
8	Aruba	--	33.4	-13.2	207.0	5.3	1.5	41.9
9	Holland	--	-4.3	19.9	6.2	43.3	66.5	20.1
10	Brazil	--	65.5	-8.4	2.6	54.9	29.1	3.3
11	Guatemala	--	23.4	11.5	3.0	43.6	8.3	10.6
12	United King and Ireland	--	54.4	12.6	-2.8	53.1	-21.9	6.1
13	India	--	61.6	18.9	66.1	14.8	28.7	34.8
14	Switzerland	--	107.7	-1.9	9.0	-85.0	-19.0	-15.5
15	Dutch Antilles	--	35.6	71.3	-66.5	4.1	176.9	-5.6
	Subtotal	--	24.3	16.6	3.2	12.3	16.4	11.2
	Rest	--	18.9	3.5	3.5	31.6	29.4	8.0
	Total	--	23.9	15.9	3.3	13.1	17.0	11.0

IMPORTS

$US millions

#	Country	1993	1995	2000	2004	2005	2006	1995-2006
1	United States	45,293	53,902	127,534	110,940	118,406	130,453	--
	China and Hong Kong	729	680	3,336	14,891	18,182	25,058	--
2	China	386	521	2,880	14,481	17,631	24,444	--
3	Japan	3,929	3,952	6,466	10,640	13,023	15,294	--
4	Germany	2,852	2,687	5,758	7,160	8,665	9,437	--
5	Canada	1,175	1,374	4,017	5,337	6,163	7,375	--
6	South Korea	837	771	3,690	5,271	6,465	10,617	--
7	Brazil	1,201	565	1,803	4,344	5,211	5,558	--
8	Taiwan	717	716	1,994	3,509	4,046	4,974	--
9	Malaysia	245	436	1,354	3,408	3,637	4,476	--
10	Spain	1,155	694	1,430	2,853	3,324	3,638	--
11	Italy	835	771	1,849	2,822	3,496	4,109	--
12	France	1,105	979	1,467	2,398	2,563	2,661	--
13	Singapur	215	289	606	2,230	2,215	1,955	--
14	Chile	130	154	894	1,464	1,754	2,470	--
15	United Kingdom and Ireland	593	532	1,091	1,461	1,865	2,141	--
	Subtotal	61,400	69,024	166,169	193,208	216,646	254,661	--
	Rest	3,965	3,429	8,289	4,095	4,769	1,543	--
	Total	65,365	72,453	174,458	197,303	221,414	256,205	--

Share (percentage over total)

#	Country	1993	1995	2000	2004	2005	2006	1995-2006
1	United States	69.29	74.40	73.10	56.23	53.48	50.92	--
	China and Hong Kong	1.12	0.94	1.91	7.55	8.21	9.78	--
2	China	0.59	0.72	1.65	7.34	7.96	9.54	--
3	Japan	6.01	5.45	3.71	5.39	5.88	5.97	--
4	Germany	4.36	3.71	3.30	3.63	3.91	3.68	--
5	Canada	1.80	1.90	2.30	2.70	2.78	2.88	--
6	South Korea	1.28	1.06	2.12	2.67	2.92	4.14	--
7	Brazil	1.84	0.78	1.03	2.20	2.35	2.17	--
8	Taiwan	1.10	0.99	1.14	1.78	1.83	1.94	--
9	Malaysia	0.38	0.60	0.78	1.73	1.64	1.75	--
10	Spain	1.77	0.96	0.82	1.45	1.50	1.42	--
11	Italy	1.28	1.06	1.06	1.43	1.58	1.60	--
12	France	1.69	1.35	0.84	1.22	1.16	1.04	--
13	Singapur	0.33	0.40	0.35	1.13	1.00	0.76	--
14	Chile	0.20	0.21	0.51	0.74	0.79	0.96	--
15	United Kingdom and Ireland	0.91	0.73	0.63	0.74	0.84	0.84	--
	Subtotal	93.93	95.27	95.25	97.92	97.85	99.40	--
	Rest	6.07	4.73	4.75	2.08	2.15	0.60	--
	Total	100.00	100.00	100.00	100.00	100.00	100.00	

Growth rate

#	Country	1993	1995	2000	2004	2005	2006	1995-2006
1	United States	--	9.1	18.8	-3.4	6.7	10.2	8.4
	China and Hong Kong	--	-3.5	37.5	45.4	22.1	37.8	38.8
2	China	--	16.1	40.8	49.7	21.8	38.6	41.9
3	Japan	--	0.3	10.3	13.3	22.4	17.4	13.1
4	Germany	--	-2.9	16.5	5.6	21.0	8.9	12.1
5	Canada	--	8.1	23.9	7.4	15.5	19.7	16.5
6	South Korea	--	-4.1	36.8	9.3	22.6	64.2	26.9
7	Brazil	--	-31.4	26.1	24.6	19.9	6.7	23.1
8	Taiwan	--	-0.1	22.7	15.2	15.3	22.9	19.3
9	Malaysia	--	33.3	25.4	26.0	6.7	23.1	23.6
10	Spain	--	-22.5	15.6	18.9	16.5	9.4	16.3
11	Italy	--	-3.9	19.1	11.1	23.9	17.5	16.4
12	France	--	-5.9	8.4	13.1	6.9	3.9	9.5
13	Singapur	--	15.9	16.0	38.5	-0.6	-11.8	19.0
14	Chile	--	8.9	42.1	13.1	19.8	40.8	28.7
15	United Kingdom and Ireland	--	-5.3	15.5	7.6	27.6	14.9	13.5
	Subtotal	--	6.0	19.2	3.8	12.1	17.5	12.6
	Rest	--	-7.0	19.3	-16.2	16.4	-67.6	-7.0
	Total	--	5.3	19.2	3.1	12.2	15.7	12.2

Source: Author, based on information from Bancomext (WTA)

Table 5
Mexico: Trade by Chapters with United States and China (1993-2006)

EXPORTS ($US millions)

		1993	1995	2000	2004	2005	2006	AAGR 1995-2006	Share 2006
	TOTAL EXPORTS	51,832	79,541	166,455	189,200	213,995	250,461	11.0	100.00
	Main 5 chapters	34,287	50,978	118,402	134,390	152,432	181,512	12.2	72.47
	Rest	17,545	28,563	48,053	54,811	61,562	68,949	8.3	27.53
85	Electronics	13,778	20,315	47,521	46,850	51,782	61,705	10.6	24.64
87	Automobiles	7,051	12,223	28,158	28,574	32,149	39,495	11.3	15.77
27	Oil	7,229	8,203	16,073	23,515	31,989	38,989	15.2	15.57
84	Autoparts	5,080	8,807	22,201	29,228	28,855	32,660	12.7	13.04
90	Optical equipment and instruments	1,149	1,431	4,449	6,223	7,656	8,664	17.8	3.46

IMPORTS ($US millions)

		1993	1995	2000	2004	2005	2006	AAGR 1995-2006	Share 2006
	TOTAL IMPORTS	65,365	72,453	174,458	197,303	221,414	256,205	12.2	100.00
	Main 5 chapters	29,429	37,461	104,413	116,800	132,527	151,920	13.6	59.30
	Rest	35,936	34,992	70,045	80,504	88,887	104,285	10.4	40.70
85	Electronics	12,821	17,322	46,263	44,432	47,976	56,521	11.4	22.06
84	Autoparts	9,455	9,990	25,340	33,735	35,932	39,884	13.4	15.57
87	Automobiles	1,929	3,861	17,061	18,474	22,150	25,098	18.6	9.80
39	Plastic materials and goods	3,655	4,783	10,443	12,665	14,301	15,942	11.6	6.22
27	Oil	1,570	1,506	5,306	7,494	12,167	14,476	22.8	5.65

Exports to the United States

		1993	1995	2000	2004	2005	2006	AAGR 1995-2006	Share 2006
	TOTAL	42,851	66,273	147,686	167,455	183,437	212,285	11.2	100.00
	Main 5 chapters	28,740	44,765	107,564	122,468	133,992	157,898	12.1	74.38
	Rest	14,110	21,508	40,121	44,987	49,445	54,387	8.8	25.62
85	Electronics	13,428	19,694	46,275	44,749	47,686	56,038	10.0	26.40
84	Autoparts	3,778	7,136	19,278	26,677	25,336	27,947	13.2	13.16
87	Automobiles	5,733	10,270	25,402	26,364	28,259	34,074	11.5	16.05
27	Oil	4,696	6,366	12,364	19,037	25,790	31,960	15.8	15.06
90	Optical equipment and instruments	1,105	1,300	4,245	5,641	6,921	7,879	17.8	3.71

Imports from the United States

		1993	1995	2000	2004	2005	2006	AAGR 1995-2006	Share 2006
	TOTAL	45,293	53,902	127,534	110,940	118,406	130,453	8.4	100.00
	Main 5 chapters	21,123	28,471	78,073	62,426	67,029	73,341	9.0	56.22
	Rest	24,170	25,431	49,461	48,514	51,377	57,112	7.6	43.78
85	Electronics	9,522	13,713	35,393	20,188	18,245	19,684	3.3	15.09
84	Autoparts	5,762	6,107	16,881	15,638	16,813	18,632	10.7	14.28
87	Automobiles	1,306	3,093	12,315	10,726	12,353	13,792	14.6	10.57
39	Plastic materials and goods	3,293	4,286	9,303	10,242	11,260	12,515	10.2	9.59
27	Oil	1,239	1,272	4,182	5,632	8,358	8,718	19.1	6.68

Exports to China

		1993	1995	2000	2004	2005	2006	AAGR 1995-2006	Share 2006
	TOTAL	45	37	204	474	1,136	1,688	41.5	100.00
	Main 5 chapters	2	5	165	371	698	1,304	66.0	77.23
	Rest	42	32	39	104	438	384	25.3	22.77
74	Copper	0	0	0	15	146	429	--	25.43
84	Autoparts	0	1	157	271	294	403	74.6	23.89
87	Automobiles	0	0	5	14	51	199	90.0	11.81
29	Organic chemicals	2	4	3	22	104	139	38.4	8.21
26	Ores, slag, ashes	0	0	0	49	101	133	--	7.88

Imports from China

		1993	1995	2000	2004	2005	2006	AAGR 1995-2006	Share 2006
	TOTAL	386	521	2,880	14,481	17,696	24,438	41.9	100.00
	Main 5 chapters	146	292	1,729	11,097	13,148	18,886	46.1	77.28
	Rest	240	229	1,151	3,384	4,548	5,552	33.6	22.72
85	Electronics	57	140	904	5,377	7,110	10,608	48.3	43.41
84	Autoparts	26	38	415	4,615	4,567	5,655	57.7	23.14
95	Toys	32	68	204	478	625	1,067	28.4	4.37
90	Optical equipment and instruments	15	20	114	388	511	927	41.5	3.79
39	Plastic materials and goods	16	26	92	239	336	629	33.7	2.57

Exports to China and Hong Kong

		1993	1995	2000	2004	2005	2006	AAGR 1995-2006	Share 2006
	TOTAL	--	541	391	755	1,328	1,970	12.5	100.00
	Main 5 chapters	--	39	288	394	745	1,384	38.2	70.28
	Rest	--	502	103	361	583	585	1.4	29.72
84	Autoparts	--	19	277	276	329	467	--	23.73
74	Copper	--	0	0	15	148	436	108.4	22.15
87	Automobiles	--	0	5	15	53	202	77.9	10.27
29	Organic chemicals	--	19	6	39	114	143	20.1	7.28
26	Ores, slag, ashes	--	0	0	50	102	135	--	6.84

Imports from China and Hong Kong

		1993	1995	2000	2004	2005	2006	AAGR 1995-2006	Share 2006
	TOTAL	--	680	3,335	14,891	18,248	25,052	38.8	100.00
	Main 5 chapters	--	374	1,958	11,334	13,552	19,213	43.0	76.69
	Rest	--	306	1,377	3,557	4,696	5,839	30.8	23.31
85	Electronics	--	187	1,078	5,499	7,312	10,830	44.6	43.23
84	Autoparts	--	54	433	4,657	4,613	5,698	52.6	22.74
95	Toys	--	74	212	490	629	1,077	27.5	4.30
90	Optical equipment and instruments	--	28	128	288	480	964	38.2	3.85
39	Plastic materials and goods	--	31	106	400	519	644	31.9	2.57

Source: Author, based on information from Bancomext (WTA).

Table 6a
Mexico: 20 leading 4-digit items exported to China and Hong Kong(2006)

			2004	2006	2004	2006	
			\$US M		Share Over Total		Growth Rate
1	8473	Parts etc for typewriters & other Office Machines	210	300	27.82	15.23	42.9
2	7404	Copper waste and scrap	0	293	0.03	14.87	117,961.0
3	8708	Parts & access for motor vehicles (Head 8701-8705)	14	151	1.91	7.68	951.4
4	2933	Heterocyclic comp, Nit Hetero-Atoms only	17	109	2.19	5.51	556.7
5	7403	Refined copper & alloys (no mast alloy) unwrought	6	94	0.85	4.78	1,367.1
6	8471	Automatic data process machines; Magn reader etc.	2	92	0.27	4.68	4,367.6
7	2603	Copper ores and concentrates	49	64	6.46	3.26	31.7
8	3915	Waste, pairings and scrap, of plastics	7	59	0.94	2.95	716.7
9	8703	Motor cars & vehicles for transporting persons	0	51	0.00	2.57	708,527.2
10	7401	Copper mattes; cement copper (precipitated copper)	8	36	1.02	1.81	361.2
11	7602	Aluminium waste and scrap	0	33	0.02	1.66	20,434.9
12	2408	Zinc ores and concentrates	0	32	0.00	1.61	241,915.8
13	8409	Parts for engines of heading 8407 or 8408	34	31	4.52	1.57	-9.2
14	2601	Iron ores and concentrates, including roast pyrites	0	29	0.00	1.47	- -
15	4107	Leather of animals Nesoi, no hair Nesoi	11	27	1.41	1.36	151.7
16	2917	Polycarboxylic acids & anhyd etc, halog, sulf etc	6	26	0.85	1.32	306.5
17	8518	Electric apparatus for line telephony etc, parts	3	21	0.42	1.08	568.1
18	0306	Crustcns lve frsh etc, Ckd etc, Flrs Mls H consumption	5	21	0.72	1.06	280.6
19	5201	Cotton, not carded or combed	4	17	0.55	0.87	310.2
20	7220	F1-R1 stainless steel products, under 600mm wide	7	15	0.97	0.75	102.2
		Main 20 4-digit items	385	1,499	50.97	76.09	289.7
		Rest	370	471	49.03	23.91	27.3
		Total exports	755	1,970	100	100	161.1

Source: Author, based on information from Bancomext (WTA)

		Table 6b					
		Mexico: 20 leading 4-digit items imported from China and Hong Kong (2006)					
			2004	**2006**	**2004**	**2006**	
			Million $US		**Share Over Total**		**Growth Rate**
1	8471	Automatic data process machines; magn reader etc.	2,419	2,555	16.24	10.20	5.6
2	8529	Parts for television, radio and radio apparatus	878	2,520	5.9.0	10.06	186.9
3	8473	Parts for typewriters & other office machines	1,654	1,866	11.11	7.45	12.8
4	75258	Trans appar for radiotele etc; TV camera & Rec	247	1,088	1.66	4.34	340.0
5	7542	Electronic integrated circuits & microassembly Pts	765	1,062	5.14	4.24	38.8
6	7524	Elec trans, static conv & induct, adp pwr supp, pt	558	801	3.75	3.20	43.5
7	7534	Printed circuits	327	640	2.20	2.56	95.8
8	9013	Liquid crystal devises Nesoi; lasers; opt appl; pt	92	553	0.62	2.21	502.3
9	8517	Electric apparatus for line telephony etc. Parts	220	550	1.48	2.20	150.2
10	9802	Expts charity Nesoi; Impts return articles, advanced	365	537	2.45	2.14	47.3
11	9504	Articles for arcade, table or parlour games, pt	61	490	0.41	1.95	698.5
12	8518	Microphones; loudspeakers; sound amplifier etc, pt	249	462	1.67	1.84	85.7
13	8536	Electrical apparatus for switching etc, Nov 1000v	241	396	1.62	1.58	64.8
14	8544	Insulated wire, cable etc; opt sheath fib cables	240	380	1.61	1.52	58.1
15	8521	Video recrdng/reproduc Appar wheth/Nt Video Tuner	284	373	1.91	1.49	31.4
16	3926	Articles of plastics (inc polymers & resins) Nesoi	197	318	1.33	1.27	60.9
17	9503	Toys Nesoi; scale models etc; puzzles; parts etc.	252	314	1.69	1.26	25.0
18	8541	Semiconductor devices; light-emit diodes etc, pts	177	258	1.19	1.03	45.8
19	8708	Parts & Access for motor vehicles (Head 8701-8705)	81	220	0.54	0.88	173.4
20	8414	Air or vac pumps, compr & fans; hoods & fans; pts	144	206	0.77	0.82	80.5
		Main 20 4-digit items	9,421	15,591	62.27	62.23	65.5
		Rest	5,469	9,461	36.73	37.77	73.0
		Total exports	14,891	25,052	100	100	68.2

Source: Author, based on information from Bancomext (WTA)

3.2. Existing bilateral institutions

Even though Mexico initiated diplomatic relations with the People's Republic of China in February of 1972 and with China in 1899, its relationship with China after its period of reforms at the end of the seventies, despite several high-level visits (Gómez Cavazos, 2005), was not formally established until August 2004 through the Bilateral Commission in of 2004. As a result, in September of 2004 both governments established a High Level Group (GAN) on a broad number of bilateral topics, including trade and investment; GAN held its first meeting in January of 2005.[22] During the group's first meeting, various subgroups were created, including the Subgroup on Statistical Cooperation, the Subgroup on the Status Recognition of the Market Economy in China and the Subgroup on Industrial Policy Material. Similarly, various agreements were signed to avoid double taxation (September 2005), maritime transport (January 2005) and to combat illegal trade and for cooperation between Bancomext and Eximbank of China (September 14th 2004) with the intent of opening reciprocal lines of credit of up to 300 million dollars to promote bilateral trade. Since then, some progress has been made in the bilateral trade of specific products, such as table grapes and avocados, among others (GAN, 2005; Anguiano Roch, 2007; Villalobos, 2007). Both institutions – the Bilateral Commission and GAN – have however so far lacked overall results on short, medium and long term topics; the lack of high-level support and leadership in both countries has been one of the main shortcomings of these institutions.

A second relevant initiative connected to the bilateral relationship with China is recent activities carried out by the National Bank for External Trade (Bancomext in Spanish), which since 2007 has been renamed "Pro-México" and comes under the Secretary of the Economy. Bancomext has made a serious effort, considering the budget granted to it by the federal government, to establish points of contact in China (Shanghai, Beijing, Guangzhou and Hong Kong) after a few offices had been closed in earlier years. One of Bancomext's current priorities is getting to know the Chinese market more in depth and identifying products for which there could be significant Chinese demand. These efforts will be carried out via trade promotion such as trade missions, campaigns for special products, participation in international fairs, reciprocal visits between buyers and investors and the Program to Boost Exports to the Chinese Market, which had funding of 25 million pesos in 2005.[23] There has not been an evaluation of the program so far, although resources and personnel clearly fall short of expectations.

Finally, the government of the state of Michoacán and the Mexican Association of Economic Secretaries (AMSDE in Spanish), with support from the federal Secretary of Economics, initiated the Scholarship Program in Business China-Mexico in 2005. This initiative, supported since 2006 by the Center for Chinese-Mexican Studies of the National

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[22] By the end of 2006 agreements had been reached on sanitary and fitosanitary measures for Chinese exports to Mexico of various agricultural products and the import of others from Mexico, the creation of work groups and the negotiation of an Agreement on the Reciprocal Promotion and Protection of Investments (APPRI in Spanish) to consolidate bilateral investments (Villalobos, 2007).

[23] The program helps companies – especially small ones – obtain access to their products in areas such as information services, consultancy, supply promotion, international fairs and agendas in Mexico, in most cases covering 50% of costs (Casas Guerrero 2005). About two years ago Bancomext offered various specialized courses to businessmen who wanted to invest in China under the slogan, "How to Do Business in China".

Autonomous University of Mexico, represents the first long-term activity to allow for a deeper socioeconomic understanding of the bilateral relationship as well as language training (AMSDE, 2007). There has not been an evaluation of the program yet, since the first projects were being implemented in 2007.

Finally, it is important to understand that the bilateral relationship has been under increasing strain in the last years, particularly from a trade perspective. On the one hand, Mexico was the last country to negotiate bilaterally China's accession to the World Trade Organization (WTO) in December of 2001; as part of this accord both countries agreed that Mexico could keep anti-dumping measures for more than 1300 tariff lines covering products such as textiles, clothing, footwear, organic chemicals, toys and pencils, among others (Dussel Peters, 2005a). These measures would only be subject to the provisions of the WTO Agreement from 12 December, 2007 (Dussel Peters, 2007 Monitor de la Manufactura Mexicana, 2007). In addition, both the United States (on 2 February, 2007) and Mexico (on 26 February, 2007) requested a WTO Panel challenging China's incentive programs for policies such as R&D, trade and industry, among others.[24] Finally, Mexico has been one of the few countries in Latin America that has not granted market economy status to China in the context of the WTO.

Part of this increasing tension is reflected in the lack of GAN results since 2004 on topics such as statistics, the recognition of China as a market economy and illegal trade and tourism, among others. In the short run, until the first quarter of 2008, at least two scenarios are imaginable: a) one in which increasing trade disputes deepen in the framework of the WTO and in bilateral institutions and in which China challenges the anti-dumping measures implemented by Mexico since 2001, while Mexico continues – together with the US – challenging China's wide range of instruments and incentives for firms, trade and production and b) one in which China does not challenge Mexico's anti-dumping measures, because most of these items are already being imported, either illegally or through the discussed "triangulation", while Mexico engages in more effective and results-oriented bilateral negotiations, in contrast to a confrontation within multilateral institutions such as the WTO.

4. The trade relationship between China and Mexico in the US market

Acknowledging the existing analysis of the trade relationship between China and Mexico in the US market,[25] what have been the main recent developments? The first part of this section provides an overview of the evolution of Mexico's and China's positions in the US market. This is taken further in the second part which analyzes the Export-Similarity Index of China and Mexico's exports to the US at an aggregate and disaggregated level to understand, through this methodology, the extent to which the two countries compete in the US market. The third part presents a simple "shift-and-share" analysis of Mexico and China's exports to the US market for several particular sectors. The last part analyses

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[24] In March 2007 China eliminated one of the subsidy programs and implemented a new income tax providing tax breaks for qualifying firms. Additional consultations were held in June 2007. Panel proceedings in that dispute are underway.

[25] See for example: Cárdenas Castro (2006); Dussel Peters (2007); Zaga Kalach (2007); Oropeza García (2006); Watkins (2007).

trends in the unit values of Mexican exports to the US in an attempt to identify the impact of Chinese competition on prices as well as the share of Mexico in the US market.

4.1. Mexico and China in the US market

First, as shown in Graph 6, both Mexico and China have been the most successful exporters to the US during 1990-2006, with AAGRs of 12.4% and 20.2%, respectively. Out of the ten main exporters to the US, China and Mexico have been able to increase their share of total US imports: in the case of China from 3.1% in 1990 to 15.5% in 2006 (or from 4.9% and 15.9% if we include Hong Kong), and from 6.1% to 10.7% for Mexico. China could become the main exporter to the US in 2007, displacing Canada (USITC, 2007).[26]

Second, the period 1990-2006 can be divided in two sub-periods: a) 1990-2000 in which both China and Mexico, increase their share of total US imports and with an AAGR of 9.5% of total US imports, and b) 2001-2006, in which the AAGR of US imports was 10.5% and with a negative dynamism during 2001-2003. It is particularly in this second period that China's presence increases, while Latin America's, Central America's and Mexico's fell substantially: China's exports to the US increased with an AAGR of 23% and Mexico's by 8.7%, resulting in a falling share in US imports for this second period.

Third, Table 7 reflects the intense competition of Chinese and Mexican products in the US market. In general, both countries have specialized in electronics and autoparts, with a share of 35.7% and 37.5% of total Chinese and Mexican exports respectively to the US in 2006. While both countries compete in these chains, China has clearly taken the lead since 2001-2002: in electronics, for example, imports from China increased by an AAGR of 22% during 2001-2006, while Mexico's AAGR was of 4.8% (see Dussel, 2008a).

Fourth, three chapters differentiate Chinese and Mexican exports to the US: automobiles (Chapter 87), which is an important chapter for Mexico, but still small – but very dynamic – for China; oil (Chapter 27), accounting for Mexican exports of $32.2 billion in 2006; and third, China's exports in chapters such as toys (Chapter 95) and furniture (Chapter 94); which are significantly smaller in absolute and relative terms for Mexico.

Graph 6
United States: Total imports from selected countries (1990-2007/09)
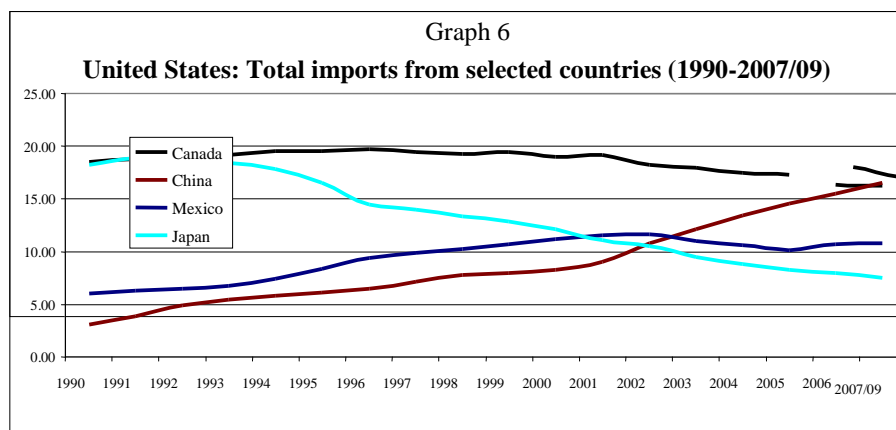
Source: Author, based on information from USITC (2007).

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[26] Until September of 2007 China had already accumulated the highest exports to the US, ahead of Canada.

Table 7
United States: imports from China and Mexico (1990-2006)

	1990	1995	2000	2002	2004	2005	2006	AAGR 1990-2006	1990	2000	2005	2006
				$US M						**Share**		
TOTAL IMPORTS	492,978	743,505	1,216,887	1,163,548	1,460,160	1,662,380	1,845,053	8.6	100.00	100.00	100.00	100.00
Main 5 Chapters	275,667	420,163	698,501	635,346	813,075	947,392	1,053,921	8.7	55.92	57.40	56.99	57.12
Rest	217,311	323,342	518,386	528,202	647,086	714,988	791,132	8.4	44.08	42.60	43.01	42.88
84 Autoparts	66,530	122,600	180,908	161,872	199,054	221,345	242,634	8.4	13.50	14.87	13.31	13.15
27 Oil	63,867	58,493	131,020	116,067	194,368	271,717	316,705	10.5	12.96	10.77	16.35	17.17
87 Automobiles	73,857	102,329	163,854	170,516	191,614	201,178	216,334	6.9	14.98	13.47	12.10	11.73
85 Electronics	58,138	114,190	186,099	152,087	183,725	206,446	227,839	8.9	11.79	15.29	12.42	12.35
90 Optical equipment & instruments	13,274	22,551	36,620	34,805	44,313	46,706	50,410	8.7	2.69	3.01	2.81	2.73
FROM CHINA	15,200	45,555	100,063	125,168	196,160	242,638	287,052	20.2	100.00	100.00	100.00	100.00
Main 5 Chapters	6,274	25,534	61,748	79,209	126,756	154,196	180,796	23.4	41.27	56.05	61.71	63.28
Rest	8,926	20,021	38,315	45,959	69,403	88,442	106,256	16.7	58.73	43.95	38.29	36.72
84 Autoparts	472	3,624	13,406	20,215	43,783	52,598	62,165	35.7	3.10	7.96	13.40	16.15
85 Electronics	1,926	7,886	19,564	24,404	39,988	52,820	64,637	24.6	12.67	17.31	19.55	19.50
95 Toys	2,122	6,222	12,382	14,441	17,219	19,079	20,848	15.3	13.96	13.66	12.37	11.54
94 Furniture	276	1,979	7,202	9,923	14,417	17,045	19,351	30.4	1.82	4.34	7.20	7.93
64 Shoes	1,477	5,824	9,195	10,227	11,348	12,654	13,795	15.0	9.72	12.78	9.19	8.17
FROM MEXICO	30,164	61,705	135,911	134,732	154,959	169,216	197,056	12.4	100.00	100.00	100.00	100.00
Main 5 Chapters	19,745	41,086	96,075	94,428	108,413	119,282	142,953	13.2	65.46	66.59	70.69	70.09
Rest	10,478	20,619	39,836	40,304	46,546	49,934	54,102	10.8	34.54	33.41	29.31	29.91
85 Electronics	7,745	16,478	35,778	32,707	37,327	39,783	47,335	12.0	25.68	26.71	26.32	24.28
87 Automobiles	3,656	10,316	26,026	26,358	26,111	26,767	33,232	14.8	12.12	16.72	19.15	19.56
84 Autoparts	2,387	6,324	17,046	17,806	20,022	21,381	23,442	15.3	7.91	10.25	12.54	13.22
27 Oil	5,288	5,837	12,779	12,213	18,934	24,998	32,161	11.9	17.53	9.46	9.40	9.06
90 Optical equipment & instruments	669	2,131	4,446	5,344	6,018	6,354	6,783	15.6	2.22	3.45	3.27	3.97

Source: Author, based on information from USITC (1991-2007)

The issue of the costs of transportation between Mexico and China in the US market is also of great importance and has received little attention so far. In general, it is believed that geographical proximity remains a relevant comparative advantage in comparison with China. Recent analysis (Dussel Peters 2008), however, suggests that while transport costs are much lower for Mexico than for China – 6.26% and 1.14% of the value of imported goods from China and Mexico respectively, in 2006 – Mexico is using the most expensive mode of transportation, i.e. 83% of Mexican exports enter the US through buses and trucks. In terms of the cost of transport relative to the distance covered this mode of transport is the most expensive. Thus, and this was shown concretely in several case studies, while transportation is expensive from Mexico, its main attraction is the possibility of supplying quickly, almost in "real time" under the heading of quick replenishment, the US market. This still poses a barrier for exports from Asia and China.

4.2. The Export-Similarity Index of Chinese and Mexican exports to the US (1990-2006)

The Export-Similarity Index (ESI) is a rather simple methodology to compare the trade structure of two countries and establishes the similarities in the shares of different products in the total exports of a country. The ESI for two countries i and j is defined as:

$ESI_{ij} = sum [min(X_{ci}, X_{cj}) * 100]$, where

X_{ci} = share of exports of good c in total exports of country i.

The coefficient varies between 1, if the composition of exports in both countries is absolutely similar, and 0 when there is no similarity at all. The ESI can be calculated for different levels of disaggregation and the results will also depend on the level of disaggregation, as with calculations on intraindustry trade (Finger and Kreinin 1979). [27] The main results of the ESI are presented in Table 8, highlighting that:

- Rather surprisingly the ESI between Mexico and China and Brazil and China in the US market is not that different, neither at 2-digits nor at 10 digits. This runs against several of the formerly discussed regional analyses, since Mexico is usually seen as a loser and Brazil as a winner in their relationship with China. In both cases – Brazil and Mexico – the ESI with China increases significantly during 1990-2006.

- The ESI between China and Mexico in the computers, peripherals and parts sector is very high and rather homogeneous for 1990-2006, reflecting a high degree of similarity of both countries for their exports in the US market.

- At the chapters or 2-digit level of the HTS between Mexico and China it is interesting to highlight that the coefficient has increased for all 5 main chapters that

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[27] As already discussed, the ESI accounts for the similarity between both export structure to the United States in specific sectors. The ESI could also be discussed in more detail – at the 10-digit level of the HTS – and would probably lead to more specific results in the future. The chapter 27, oil, for example, refers to hundreds of specific oil-related products with different levels of value-added, technology and degree of transformation. Thus, the ESI in some cases can lead to misleading results, for example in the case of chapter 27 in which China and Mexico apparently account for a rather high ESI, while their exports and export-specialization is very different.

are being exported by Mexico, and in particular in electronics, autoparts and optical equipment and instruments, while the index is rather high – but remains constant – for the period. From this perspective, the ESI reinforces the already discussed conclusion that Mexico and China compete – so far – in electronics, optical equipment and instruments and autoparts in the US market, while competition in automobiles is so far low.

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Mexico-China, total commodities																	
2 digits of the HTS	38.79	40.46	40.74	41.13	46.00	50.57	51.81	53.34	56.24	57.28	57.73	57.68	57.86	56.41	58.09	58.46	56.98
10 digits of the HTS	15.96	14.27	13.74	12.53	12.65	13.33	14.59	15.70	16.27	16.20	15.93	15.87	16.11	14.94	15.45	17.19	16.85
Brazil-China, total commodities																	
2 digits of the HTS	34.48	38.75	38.47	40.07	39.80	40.67	40.73	42.81	41.54	40.24	41.18	42.22	43.57	41.52	37.92	39.38	38.50
10 digits of the HTS	8.25	9.53	11.24	10.74	10.69	10.75	9.84	9.47	9.83	9.98	10.87	11.77	12.77	12.91	13.23	14.79	13.62
Mexico-China in computers, peripherals and parts																	
Total (109 commodities)	20.64	60.55	50.75	34.35	69.33	79.74	31.64	34.49	42.69	46.25	50.00	52.31	51.25	50.54	37.65	38.83	37.87
Main 25 Mexican commodities (according to share of 2006)	0.00	100.00	0.00	100.00	73.16	82.52	15.59	18.68	23.87	29.18	37.27	45.93	52.05	51.14	38.96	40.26	39.89
Main 25 Mexican commodities (according to share during 1990-2006)	0.00	100.00	0.00	100.00	71.11	81.83	37.12	39.65	49.55	52.60	57.00	56.21	56.27	52.03	38.63	39.37	38.74
Main 25 Chinese commodities (according to share of 2006)	0.00	0.00	0.00	0.00	71.11	83.99	32.02	34.34	43.29	50.13	52.13	52.63	51.81	50.98	38.01	39.50	37.84
Main 25 Chinese commodities (according to share of 1990-2006)	0.00	0.00	0.00	0.00	73.16	84.72	31.19	34.14	43.97	46.95	51.59	53.09	51.72	51.25	37.85	39.27	37.79
Mexico-China for Mexican 5 main export Chapters																	
Electronics	16.80	19.88	23.66	23.94	24.13	26.47	28.15	30.32	28.28	29.72	31.33	30.08	31.99	31.52	32.61	32.46	33.87
Automobiles	13.64	13.00	15.06	13.07	10.50	9.68	8.38	8.12	9.36	10.89	11.47	11.68	13.02	14.83	15.84	18.11	17.45
Autoparts	17.48	23.97	29.49	27.86	23.12	27.04	27.22	31.35	37.60	39.95	42.72	38.79	38.06	33.19	25.98	25.68	25.13
Oil	36.40	42.57	37.91	39.27	42.19	49.71	48.73	49.43	47.95	30.95	41.63	36.38	27.33	23.33	20.27	32.30	36.63
Optical equipment and Instruments	17.85	14.01	20.63	14.94	15.74	15.20	17.98	14.12	18.05	17.08	16.39	18.47	21.33	22.45	21.92	23.61	26.51

Source: Author, based on **USITC (1991-2007)**

Finally, Graph 7 calculates the ESI for China and Mexico for a number of important Mexican chapters, i.e. at a 2 digit-level of the Harmonized Tariff System (HTS), for specific periods and attempting to go beyond annual substantial changes. With the exception of oil, in all the rest of the considered chapters the ESI increases significantly from 1990-2000 to 2001-2006 and at relatively high levels.

Graph 7
Export-Similarity Index for Mexico and China in the US (1990-2006)
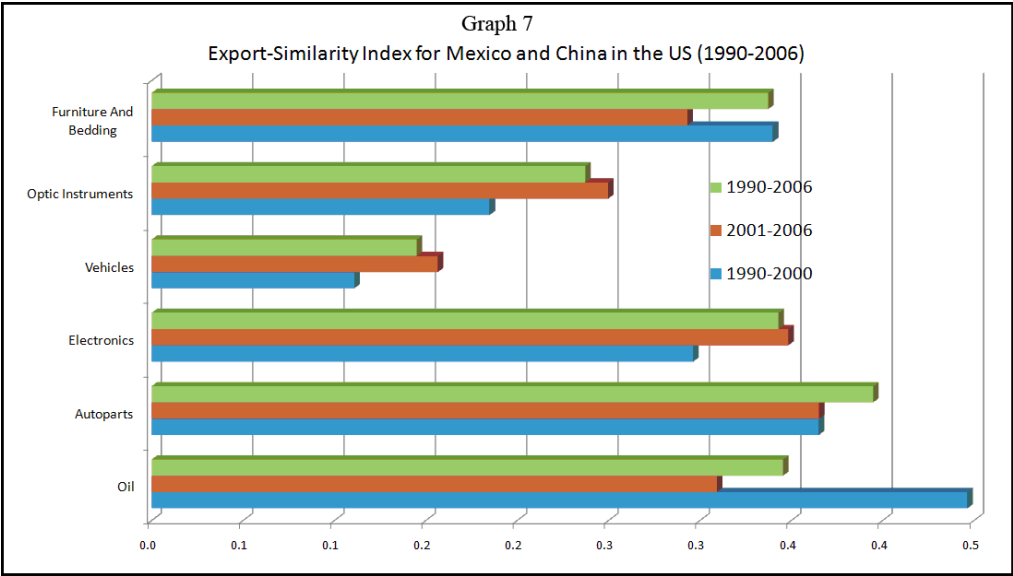
Source: Author, based on information from USITC (1990-2007)

4.2. A shift and share analysis of Chinese and Mexican exports to the US (1990-2006)

Shift and share analysis has been widely used in the last decades to examine differences in variables such as trade, employment and productivity, among others (Richardson 1978). In general it has proved to be a useful descriptive tool for isolating trends in the respective performance. The goal in this section is to compare China and Mexico's export performance – at an aggregate level, but also for electronics in general and specifically for PCs – according to its highest share over total US imports. As a result, this brief analysis will focus on the shift effect – i.e. based on changes in the share of total exports and its changes measured in absolute US dollar terms – among both countries.[28] From this perspective, this analysis does not include a causal and dynamic analysis and does not identify the reasons for these changes, but rather presents the extent of changes that have taken place.

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[28] For a more detailed analysis, see Dussel Peters (2007).

TOTAL IMPORTS	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1990-2006
China-total (millio US$)	15,120.00	18,855.00	25,514.00	31,425.00	38,592.00	45,370.00	51,209.00	61,996.00	70,815.00	81,522.00	99,581.00	102,069.00	124,796.00	151,620.00	196,160.00	242,638.00	287,052.00	1,644,315.00
Mexico-total (million US$)	29,506.00	30,445.00	33,935.00	38,668.00	48,605.00	61,721.00	74,179.00	85,005.00	93,017.00	109,018.00	134,734.00	130,509.00	134,121.00	137,199.00	154,959.00	169,216.00	197,056.00	1,661,893.00
China (share over total)	3.08	3.90	4.86	5.47	5.86	6.13	6.48	7.19	7.80	8.01	8.26	9.01	10.81	12.13	13.43	14.60	15.56	9.81
Mexico (share over total)	6.01	6.29	6.46	6.73	7.39	8.34	9.38	9.86	10.25	10.71	11.18	11.52	11.61	10.98	10.61	10.18	10.68	9.92
Mexico-total (based on a maximum share of 2001) (million US$)	57,043.00	56,162.00	60,967.00	66,742.00	76,380.00	85,875.00	91,774.00	100,128.00	105,378.00	118,124.00	139,940.00	131,499.00	134,074.00	145,136.00	169,525.00	193,002.00	214,211.00	1,945,958.00
China (based on a maximum share of 2006) (million US$)	76,450.00	75,270.00	81,710.00	89,449.00	102,367.00	115,091.00	122,997.00	134,194.00	141,230.00	158,313.00	187,551.00	176,238.00	179,689.00	194,515.00	227,201.00	258,666.00	287,090.00	2,608,019.00
TOTAL IMPORTS IN ELECTRONICS																		
China-total imports in electronics (million US$)	489.00	646.00	964.00	1,378.00	3,089.00	4,556.00	9,421.00	12,966.00	16,446.00	19,711.00	25,961.00	27,226.00	36,433.00	47,445.00	69,323.00	86,979.00	102,727.00	465,758.00
Mexico-total imports in electronics (million US$)	14,721.00	1,632.00	2,101.00	2,464.00	5,662.00	6,462.00	12,958.00	17,391.00	23,152.00	27,258.00	35,092.00	36,962.00	35,134.00	34,620.00	39,047.00	40,219.00	46,576.00	368,150.00
China-total imports in electronics (share over total)	2.25	2.69	3.70	4.43	5.86	7.17	6.51	7.70	9.07	9.66	10.34	11.89	15.81	19.71	24.60	28.38	31.03	16.71
Mexico-total imports in electronics (share over total)	6.53	6.78	8.06	7.93	10.75	10.17	8.96	10.33	12.77	13.36	13.97	16.14	15.25	14.38	13.86	13.12	14.07	13.20
Mexico (based on maximum share of 2001) (million US$)	3,512.00	3,882.00	4,205.00	5,016.00	8,501.00	10,252.00	23,340.00	27,160.00	29,269.00	32,936.00	40,535.00	36,969.00	37,191.00	38,851.00	45,480.00	49,462.00	53,437.00	449,998.00
China (based on maximum share of 2006) (million US$)	6,751.00	7,464.00	8,083.00	9,664.00	16,344.00	19,710.00	44,872.00	52,216.00	56,272.00	63,321.00	77,931.00	71,075.00	71,502.00	74,694.00	87,438	95,093.00	102,736.00	865,146.00
TOTAL IMPORTS IN PCs																		
China (million US$)	0.00	0.00	0.00	0.00	326.00	490.00	2,309.00	3,355.00	4,404.00	5,971.00	8,256.00	8,173.00	11,947.00	18,653.00	29,486.00	35,465.00	40,020.00	168,856.00
Mexico (million US$)	0.00	0.00	0.00	0.00	242.00	215.00	2,117.00	3,455.00	4,012.00	5,493.00	6,869.00	8,466.00	7,906.00	6,956.00	7,375.00	6,732.00	6,576.00	66,414.00
China (share over total)	0.02	0.14	0.01	0.00	5.47	6.77	4.84	6.02	8.01	9.74	12.05	13.84	19.17	29.14	39.91	46.36	47.87	23.34
Mexico (share over total)	0.01	0.07	0.03	0.08	4.05	2.97	4.44	6.20	7.29	8.96	10.02	14.34	12.68	10.87	9.98	8.61	7.87	9.18
Mexico (based on maximum share in 2001) (million US$)	29.00	26.00	27..00	41.00	856.00	1,038.00	6,844.00	7,996.00	7,889.00	8,787.00	9,828.00	8,468.00	8.937	9,181.00	10,594.00	11,212.00	11,989.00	103,744.00
China (based on maximum share in 2006) (million US$)	98.00	88.00	91.00	138.00	2,857.00	3,464.00	22,848.00	26,692.00	26,337.00	29,334.00	32,809.00	28,267.00	29,834.00	30,647.00	35,367.00	37,427.00	40,022.00	346,318.00

a: The calculations assume for Mexico and China the highest share over total US-imports achieved during 1990-2006
Source: Author, based on information from USITC

The previous part highlighted the increasing presence of China in US imports during the period 1990-2006. Table 9 calculates changes in China and Mexico's exports to the US considering their respective maximum share in total US imports, and keeping the rest of exports to the US constant. This exercise is performed for total imports, electronics and PCs. In all three sectors considered (total imports and those in electronics and in PCs) China increases its share in total US imports dramatically: the share of China's exports to the US increased by a factor greater than 5 for the period to account for 15.6% in 2006 and the dynamism has been even more impressive in electronics and PCs, in the latter increasing its share of US imports from 0.02% to 47.9% between 1990 and 2006. In this context, Mexico's integration with the US market has also been positive but, as already discussed earlier, primarily during 1990-2001/2002, and its share has fallen since then for total imports, electronics and PCs. In the case of the latter, for example, the share has fallen from 14.3% in 2001 to 7.9% in 2006.

The results presented in Table 9 are also relevant from several perspectives. On the one hand they show that Mexico's export performance in the US was very positive until 2001, but has fallen since then, i.e. in 2006 Mexican exports represented 92% of exports achieved through its highest share of 2001. In contrast, China accounted for its highest share of total US imports in 2006 as a result of increasing exports to the US since 1990. On the other hand, Table 8 also shows that for the case of specific chains or segments the fall in Mexico's share of total US imports has been substantial: in electronics, for example, which accounted for 25% of total Mexican exports to the US, the level in 2006 was 18% below its potential share of 2001. In the case of PCs, the fall in Mexico's share represented more than 45% of its actual exports in 2006. In all three cases China achieved its highest share in 2006.

From this perspective, while it is true that Mexico has lost its share in total US imports, as already discussed, it is also true that it has recovered slightly since 2004 and that in 2006 aggregate exports are not significantly below its highest share of 2001. On the other hand, specific chains and segments, such as PCs have suffered substantially as a result of a dramatic share loss.

Table 10 shows in more detail the results of the shift-and-share analysis, specifically[29]:

- The global demand effect (GDE), which reflects the calculated results if growth would have been similar in all sectors of the considered countries, shows that Mexico and China did benefit substantially during 1990-2000 and that actual exports to the US grew far more than could be accounted for by the GDE. The situation, however, changes for 2001-2006, as already discussed. The estimations for GDE were calculated in two forms: a) with the growth rate for 1990-2006 and, b) with the growth rate for 2001-2006. The results are contrasting: in the case of Mexico, for example, in the first case estimated exports to the US were only 56.23% of actual exports, while estimated exports – calculated using the growth rate for 2001-2006 – were much higher than actual exports (107.9%), i.e. the GDE accounts for important benefits of Mexico's exports to the US in the first period (1990-2000),

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[29] For a detailed explanation of the shift-and-share analysis, also widely used by ECLAC in its MAGIC-software, see: Buitelaar (1997) and Dussel Peters (2001).

but a strong fall in the second.[30] The GDE, on other hand, shows that China's exports to the US are, in both cases, well beyond estimated exports and accounted in 2006 for 19.78% and 57.92%, respectively. Thus, while Mexico showed a performance below global demand for total US imports, China was far above this effect for the period 2001-2006.

- The structural demand effect (SDE) – which reflects the benefits of a country specializing in products, electronics and PCs in this case – accounts for massive benefits for Mexico and China for specializing in electronics and PCs during 1990-2006, as well as for the exports of the rest of the world to the US. The situation changes, however, when estimating the SDE for 2006 and when considering the growth rates for 2001-2006; in this case both countries, China and Mexico, lose massively according to this estimation.

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[30] As already discussed, Mexico's difficulty with integration to the US's is a result of a falling demand in US imports as well as Mexico's limitations to increase exports to the US.

Table 10
Shift-and-Share analysis: Imports to the United States 1990-2006

	1990	2000	2001	2006	1990-2006
TOTAL					
China	15,120	99,581	102,069	287,052	1,644,315
Mexico	29,506	134,734	130,509	197,056	1,661,893
Rest	446,697	971,024	900,057	1,360,945	13,454,840
Total	491,322	1,205,339	1,132,635	1,845,053	16,761,049
TOTAL IMPORTS IN ELECTRONICS					
China	489	25,961	27,226	102,727	465,758
Mexico	1,421	35,092	36,962	46,576	368,150
Rest	19,848	190,095	164,865	181,783	1,954,187
Total	21,758	251,148	229,053	331,085	2,788,095
TOTAL IMPORTS IN PCs					
China	0	8,256	8,173	40,020	168,856
Mexico	0	6,868	8,466	6,576	66,414
Rest	204	53,412	42,410	37,010	488,186
Total	204	68,538	59,049	83,606	723,456
TOTAL IMPORTS IN NON-ELECTRONICS					
China	14,631	73,620	74,843	184,326	1,178,557
Mexico	28,085	99,643	93,547	150,480	1,293,743
Rest	426,849	780,929	735,192	1,179,162	11,500,654
Total	469,565	954,191	903,582	1,513,968	13,972,954
TOTAL IMPORTS IN NON-PCs					
China	15,120	91,324	93,897	247,033	1,475,459
Mexico	29,506	127,865	122,043	190,480	1,595,480
Rest	446,493	917,612	857,647	1,323,935	12,966,654
Total	491,119	1,136,801	1,073,587	1,761,447	16,037,593

GLOBAL DEMAND EFFECT	Estimated			Difference with real imports (real = 100)		
Total Imports	2000[a]	2006[a]	2006[b]	2000[a]	2006[a]	2006[b]
China	37,093	56,779	166,270	37.25	19.78	57.92
Mexico	72,386	110,803	212,598	53.72	56.23	107.89
Rest	1,095,861	1,677,471	1,466,185	112.86	123.26	107.73
Total	1,205,339	1,845,053	1,845,053	100.00	100.00	100.00

STRUCTURAL DEMAND EFFECT	Total			Electronics			Non-electronics		
Total Imports in Electronics[c]	2000[a]	2006[a]	2006[b]	2000[a]	2006[a]	2006[b]	2000[a]	2006[a]	2006[b]
China	-1,716	-2,164	-1,515	4,446	5,606	-4,997	-6,162	-7,770	3,482
Mexico	1,085	1,369	-2,432	12,914	16,284	-6,784	-11,829	-14,916	4,352
Rest	631	795	3,947	180,410	227,487	-30,260	-179,779	-226,692	34,206
Total	0	0	0	197,770	249,378	-42,041	-197,770	-249,378	42,041

Total Imports in PCs[c]	Total			PCs			Non-PCs		
China	-2,082	-2,535	-641	12	15	-1,742	-2,095	-2,550	1,101
Mexico	-4,079	-4,967	-374	9	10	-1,804	-4,088	-4,977	1,431
Rest	6,161	7,502	1,015	68,017	82,816	-9,038	-61,856	-75,314	10,053
Total	0	0	0	68,038	82,841	-12,584	-68,038	-82,841	12,584

a Based on US's total imports growth rate for 1990-2006, base year 1990.   b Based on US's total imports growth rate for 2001-2006, base year 2001
c Assuming two sectors, electronics and non-electronics (for the rest of the respective imports).
Source: Author, based on information from USITC

4.4. The unit value of Mexican exports to the US and the net barter terms of trade

The literature on the statistical debate on the terms of trade (TT) traditionally involved the analysis of the net barter terms of trade (NBTT) between primary products and manufactured goods (Diakosavvas and Scandizzo 1991; Sarkar 2001; Ocampo and Parra 2003; Torres 2006). However, the interest in this topic broadened in three ways: a) considering all goods and not only primary-manufacturing, b) the direction of trade, i.e. the origin and destination of the goods considered, and c) classifications of goods according to different degrees of innovation and technology (Sarkar and Singer, 1991; Berge and Crowe, 1997; Maizels, 2000).

Given the trade structure of Mexico, what has happened to the NBTT, bearing in mind the potential effects of China's penetration of the US market on Mexico (Kaplinsky 2006)? The section will include an analysis of China's and Mexico's trends in NBTT in the US market and presents the basis for future more detailed work. [31]

In the work of León and Soto (1995), evaluating the NBTT of the majority of Latin American countries with ECLAC data, they found that for the period 1928-1993 there was no statistically significant tendency for Mexico. For US manufacturing, Maizels (2000) found that for the first half of the 1980s a significant improvement in the NBTT took place with developing countries, while the relationship with industrialized countries was trendless. In the case of the latter countries the NBTT turned negative until 1997.

For the Chinese case, Zhihai and Yumin (2002) estimated a deterioration of 13% for 1993-2000 for total trade (not including oil). For the case of trade with the US, China suffered a fall of 23% and 24% for all goods and manufacturing, respectively.

In what follows we will analyze the unit values of imports and NBTT for Mexico and China in the US, based on US statistics.[32] We will include total trade of the US, with Mexico and China by the Harmonized Tariff System (HTS) at 10-digits. So far, and according to our literature review, only 5-digit level analysis – according to the SITC classification – has been done; there has been no NBTT analysis for exports and imports for 1990-2006. [33]

A few technical topics are relevant for understanding the results:

> 1. Although several hundred 10-digit items were eliminated in order to calculate the unit values and to eliminate outliers, the representativity was still very high: for total US imports, for example, 10-digit items used accounted for 82%,

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[31] Detailed previous analysis with Chinese and Mexican customs data at the 6-digit level proved not to be useful for the analysis, particularly as a result of difficulties in calculating the unit value as a result of short time series and changes in the unit of imports (such as in Mexico before and after 2003).

[32] As a result of the scope of this analysis, we will not include a detailed description of the construction of indexes, its selection (Paasche, Laspeyres, Fisher, etc.), its specificity (simple or chained) and the base year, as well as the election of the goods to be included in the index (either full series or specific chriteria for considering only a group of commodities). The chained Laspeyres Index was used for calculating the NBTT, considering that chaining will reduce the spread between the index, i.e. in terms of the amount of price change that has occurred between the two periods under consideration.

[33] Kaplinsky and Santos Paulino (2005, 2006) use the information from EUROSTAT for the European Union based on the Harmonized Tariff System at the 8-digit level, but only for its import prices.

74% and 78% of total US imports and of imports from China and Mexico, respectively during 1990-2006 (see Table 11).

2.   Bearing in mind the goal of this section – to analyze the possible effects of China's exports on Mexican exports – in this case to the US market, which accounted for 84% of total Mexican exports during 2000-2007 – 21 indexes were calculated: 12 for total US imports and China and 9 for Mexican imports.

> a.   For imports the following index were calculated: i. total US imports for chapters 1-29 (a proxy for primary products) and 30-99 (a proxy for manufactured commodities) of the HTS, ii. A selection of total and Chinese imports based on Mexican exports to US in order to detail China's competition with Mexican exports in the US market and thus eliminating China's exports to the US that do not compete with Mexico. This new universe of US imports were also disaggregated into total imports, for primary and manufacturing goods, iii. In addition, and based on the former universe of goods from China and total US imports that compete with Mexican exports, two groups of products were calculated based on the following criteria: I. Those in which the share of China at the 10-digit level is above 20% of total US imports for the period 2001-2006, and II. Those in which the growth of its share over total US imports during 2001-2006 was above China's total growth share of 14%, i.e. in this group of items the share increased substantially and above the impressive growth of the share of China during 2001-2006. For both groups the division into total, primary and manufacturing goods was also calculated.

Table 11
Representativity of data according to specific used criteria
(share over respective total)

	WORLD		MEXICO		CHINA	
	1990 -2006	2001 -2006	1990 -2006	2001 -2006	1990 -2006	2001- 2006
			IMPORTS			
Total (chapters 1-99)	100	100	100	100	100	100
Total, used for construction of indexes and including outliers (chapters 1-99)[a]	82	82	78	79	75	74
Final used data[b]						
Raw Materials	20	22	18	18	4	3
Manufacturing	62	60	61	61	72	71
Total	82	82	78	79	75	74
Competition with Mexico						
Total US-imports						
Raw materials	18	21			3	2
Manufacturing	60	58	Does not apply		71	70
Total	78	79			73	72
Criteria 1 (China's >20% share in product)						
Raw materials	1	1	0	0	2	2
Manufacturing	16	19	16	16	58	62
Total	17	19	16	16	59	63
Criteria 2 (China's >14% share in growth of product)						
Raw materials	1	1	1	1	1	1
Manufacturing	24	27	29	32	26	33
Total	25	28	30	32	27	33
			EXPORTS			
Total exports	100	100	100	100	100	100
Total, used for construction of indexes and including outliers	77	73	68	69	77	81
Without representative atypical unitary prices	74	72	66	68	76	80

a Here we include all the data for 10-digit items that include quantities and values.
b Several items were eliminated given their high volatility and their effects on the respective index; their weight is very small on total trade and is not significant.
Source: Author, based on information from USITC (1990-2007)

What are the main results of the calculations? They can be divided under two headings: the tendencies in unit values of US imports during 1990-2006 and tendencies in NBTT for the same period. In all cases 2001 was defined as the base year for the calculations, given the prior analysis which showed that China has entered the US market on a massive scale since 2001, with significant impacts on other exporters, including Mexico.

The tendencies in unit values of imports during 1990-2006 do reflect interesting differences. On the one hand, while manufacturing unit values only increased slightly since 2001, they rose sharply for raw materials, reaching 125% in 2006. Considering that Chinese exports to the US (and in general) exclusively concentrate in manufacturing, Chinese unit values only increased slightly, while the differences are substantial for Mexico: unit values for exports of raw materials to the US increased by 36.3% to 2006 and only by 2.7% for manufacturing. These tendencies are also true when only considering the unit values for Mexican exports and those that compete with Chinese and total imports from the US (see Table 12).

Table 12
US Imports: Unitary prices (1990-2006)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
TOTAL IMPORTS																	
Mexico																	
Raw materials		103.08	112.50	101.36	113.61	116.55	120.26	112.05	89.40	133.60	154.55	100.00	103.41	129.55	135.29	138.37	136.26
Manufacturing		101.87	95.53	88.32	74.08	88.32	78.41	91.93	91.03	94.63	97.03	100.00	90.17	95.12	93.88	96.15	102.68
Total Mexico		107.45	106.19	97.94	90.07	101.87	94.29	104.13	99.54	93.81	104.12	100.00	110.31	115.46	110.31	113.65	119.11
China																	
Raw materials		84.32	97.22	88.20	101.95	100.39	101.95	97.05	89.51	95.77	101.28	100.00	83.98	102.16	108.89	121.01	103.90
Manufacturing		117.96	113.38	108.53	97.00	95.68	101.67	110.23	107.34	108.62	110.94	100.00	102.51	110.32	116.99	110.70	113.35
Total China		114.34	112.33	107.17	97.41	96.05	101.80	109.55	106.39	107.98	110.45	100.00	101.60	109.91	116.58	111.18	112.87
Total imports from US																	
Raw materials		98.03	107.67	92.68	104.80	105.49	112.57	105.95	87.00	118.31	140.84	100.00	68.19	118.90	122.12	135.86	124.88
Manufacturing		102.01	101.81	102.81	90.41	103.02	83.63	97.17	95.84	98.44	104.93	100.00	91.56	102.68	106.36	103.26	105.87
Total US imports		100.78	103.16	100.38	93.54	103.59	89.19	99.04	94.09	102.07	111.68	100.00	86.25	106.25	110.15	111.54	111.14
IMPORTS ONLY ACCORDING TO MEXICAN EXPORTS TO THE US																	
Mexico																	
Raw materials		103.08	112.50	101.36	113.62	116.55	120.23	112.04	89.47	133.53	154.55	100.00	103.41	129.55	135.29	138.37	136.26
Manufacturing		101.88	95.54	88.33	74.21	88.33	78.41	91.93	91.03	94.64	97.03	100.00	90.17	95.12	93.94	96.33	102.66
Total Mexico		107.45	106.19	97.94	90.17	110.36	116.99	106.59	122.44	93.81	104.12	100.00	110.31	115.46	110.31	113.79	119.09
China																	
Raw materials		84.85	99.55	90.23	103.44	110.59	104.63	97.34	89.48	97.88	107.98	100.00	84.09	102.78	107.46	119.89	107.02
Manufacturing		119.00	112.88	109.80	98.45	100.55	102.17	110.35	107.51	108.50	111.03	100.00	102.68	110.46	117.13	110.50	113.42
Total China		115.43	112.19	108.63	98.86	101.13	102.38	109.82	106.73	108.08	110.88	100.00	101.95	110.15	116.75	110.79	113.15
Total imports from US																	
Raw materials		97.46	103.75	92.26	102.16	106.96	111.74	102.32	84.13	118.56	142.01	100.00	66.80	117.45	119.00	131.67	125.17
Manufacturing		100.39	101.33	102.75	89.92	103.18	84.93	96.87	95.67	98.38	104.89	100.00	90.50	102.64	106.39	103.52	105.64
Total US imports		99.49	101.83	100.31	92.50	103.98	89.89	97.99	93.46	101.84	111.47	100.00	85.24	105.79	109.33	110.50	110.99

Source: Author, based on information from USITC (1990-2007)

More detailed analysis shows, however, a different picture: Table 13 indicates that using the earlier specified criteria – i.e. criteria 1 defined by all 10-digit items in which China presents a share above 20% of all respective imports in 2006 and criteria 2, in which China's share increased by more than 14% during 2001-2006, two patterns arise: a) under criteria 1 Mexico's unit values do benefit in manufacturing – reaching 119% in 2006, and do much better than China, b) under criteria 1 – i.e. all those 10-digit items in which China's share increased by more than 14% during 2001-2006 – Mexico's unit values show a particularly bad performance since 2001 and account for 98% in 2006 for manufacturing. This differentiated performance is relevant, since it shows that unit values do perform well since 2001 in items in which China already has a big share (over 20%), while the unit values in those where China is still increasing its share and competing are falling significantly. In Mexico's case the difference in the performance between both groups of export-items is very significant and account for the competition of Chinese and Mexican products in the US market (see Graph 8). [34]

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[34] Results for unitary values of total US imports do also reflect important differences between tendencies in raw materials and manufacturing, i.e. an improvement in unitary prices for imports in raw materials since 2003. This would favor a more detailed discussion on the topic, such as suggested by Kaplinsky (2006).

Table 13

Unitary Values of US Imports: Tendencies According to Different Sets of Imports[a]

CRITERIA 1[b]	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Mexico																	
Raw materials		88	92	94	89	97	99	90	96	89	96	100	101	100	99	108	110
Manufacturing		108	114	103	105	100	98	98	99	101	103	100	94	100	97	106	119
Total of Mexico		107	113	102	105	100	98	98	99	101	103	100	95	99	97	106	119
China																	
Raw materials		108	103	89	102	121	107	98	98	97	108	100	100	109	117	118	109
Manufacturing		115	106	104	102	109	106	102	100	98	101	100	98	101	107	102	105
Total of China		114	106	104	102	109	106	102	100	98	101	100	98	102	107	102	105
Total US																	
Raw materials		104	99	80	110	157	102	93	90	94	91	100	86	98	101	104	100
Manufacturing		103	102	100	101	106	104	99	96	96	101	100	95	99	103	100	104
Total		104	102	99	102	109	104	99	96	96	100	100	94	99	103	100	104
CRITERIA 2[c]																	
Mexico																	
Raw materials		105	102	78	96	102	98	111	92	100	99	100	104	103	97	105	107
Manufacturing		101	101	94	94	93	90	94	89	94	93	100	88	91	88	94	98
Total of Mexico		101	100	92	94	93	90	94	89	94	93	100	88	92	88	94	98
China																	
Raw materials		115	92	93	98	119	97	105	93	95	115	100	100	96	105	115	101
Manufacturing		122	106	111	101	115	109	105	107	97	105	100	99	98	107	94	100
Total of China		122	105	110	101	115	109	105	107	97	105	100	99	98	107	94	100
Total US																	
Raw materials		105	93	79	98	131	95	91	90	100	91	100	85	92	94	96	95
Manufacturing		105	102	108	101	107	105	99	95	96	101	100	96	99	103	101	102
Total		105	101	106	101	108	104	98	94	96	101	100	95	99	102	101	101

a In all cases, on Mexican item imports define the set of imported items, also for Chinese and total imports
b Refers to all 10-digit items in which China has a share on total US-imports above 20%
c Refers to all 10-digit items in which China's share increased by more than 14% during 2001-2006
Source: Author, based on information from USITC (1990-2007)

Graph 8
Unit value of US-imports for 10-digit items in which China´s share increased by more than 14% during 2001-2006
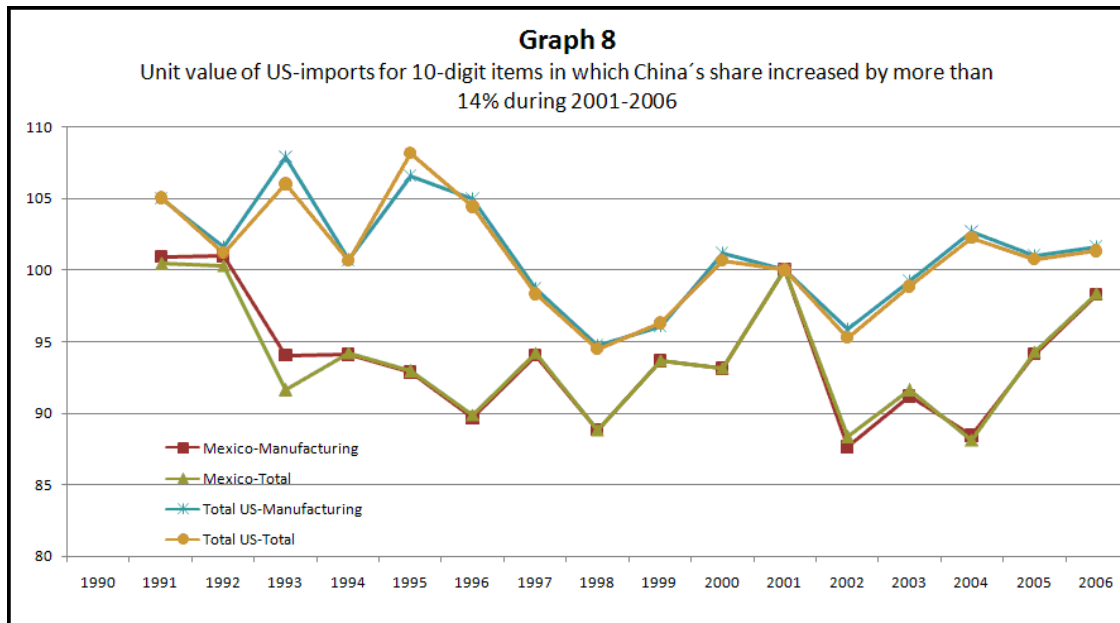
Source: Author, based on information from USITC (1990-2007)

Tendencies for Net Barter Terms of Trade (NBTT) also show important differentiated tendencies for total trade, Mexico and China during 1990-2006. In general, both data sets – i.e. for total trade and only for those goods traded between Mexico and the US – display a similar tendency: Mexico's NBTT in manufacturing have moved in favor of the US and against Mexico by 19% for 2001-2006, while they fell by 1% for Chinese manufacturing imports (see also Graph 9).

Graph 9
NBTT of the US in manufacturing: Total, China and Mexico (1990-2006)
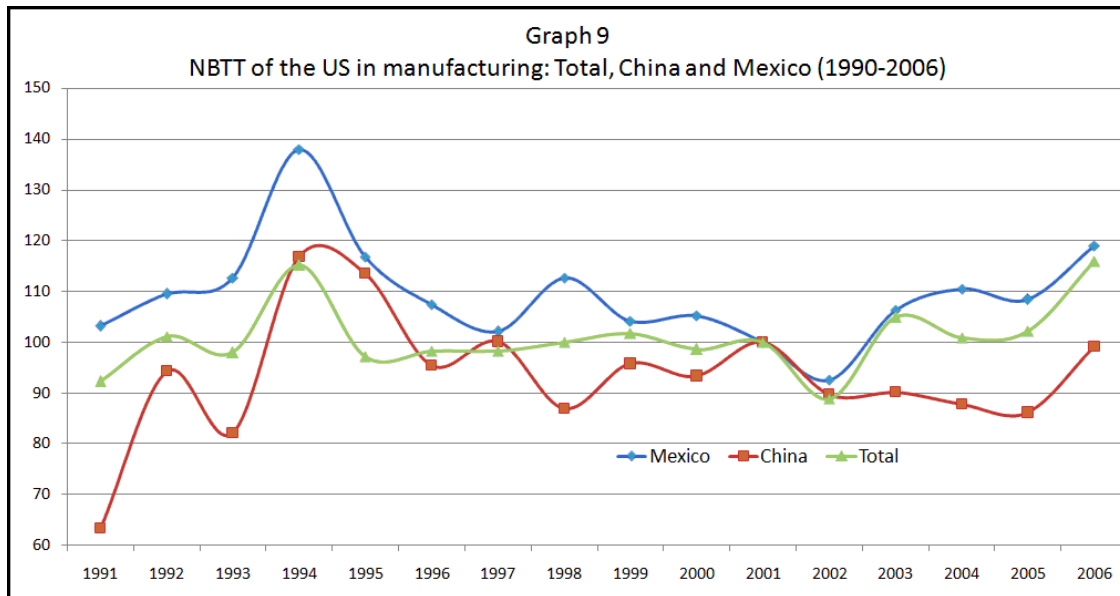
Source: Author, based on information from USITC (1990-2007)

As a result, the United States have benefited substantially from competition between China and other countries, including Mexico. Thus, NBTT have benefited the US from 2001, since China's massive exports to the US. One of the main losers of this process has been Mexico, resulting in significant losses in NBTT in Mexico's main export items, manufacturing.

5. Effects of China's trade on Mexico's manufacturing employment

This section deepens some of the already existing analysis of the bilateral relationship between Mexico and China, particularly in terms of trade and the effects of China's increasing presence in Mexico on its manufacturing employment. Topics analyzed previously, particularly Mexico's poor employment record in manufacturing and the increased penetration of the domestic market by Chinese imports, are relevant for this section.

In the case of Argentina, Castro, Olarreaga and Saslavsky (2007) found that a 1% increase in imports generates a 0.07% decrease in manufacturing employment. Imports from China only explain between 0.1% and 0.2% of the fall of manufacturing employment resulting from total imports. In the case of Brazil the effect on employment is twice as high.

From this perspective, what is the effect of imports on Mexico's manufacturing employment and in particular as a result of imports from China?[35] To estimate the impact of changes in import penetration on labor demand, we follow Greenway et. al (1998) and assume a Cobb-Douglas production function across industry and time. From a firm's optimization conditions we can establish a base model whose dependent variable is labor demand, explained by its own lagged labor demand, wages and production (or capital stock).

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[35] For a full discussion see Castro, Olarreaga and Saslavsky (2007).

In addition, international trade variables explain labor demand: import penetration (understood as total imports over apparent consumption) and imported inputs used for production (which could be understood as complementary to employment). As an option, the interaction between import penetration and the share of total US imports from Mexico is also considered. Finally, several dummies in time and sectors were included in order to control for heterogeneity

OLS, IV and GMM-estimations were pursued to correct for potential biases in the respective estimations (Arellano and Bond 1991). The methodologies allowed for correcting for biases in the estimations. The first, caused by joint determination is endogeneity of an independent and the dependent variable. The second can occur as a result of inertia of some aggregated variables such as employment, whose magnitude can be explained by its prior, lagged behavior, causing serial correlation. In the case of both problems, GMM is usually used since it lacks the biases in estimates in the context of these problems.

Variables were obtained from Instituto Nacional de Estadística, Geografía e Información (INEGI) for Mexico's manufacturing sector and its 49 branches for 1994-2003. All variables are expressed in nominal terms and were transformed to $US; in the case of imports and exports they were additionally deflated by Mexico's inflation. In the case of the variables expressed in current pesos (wages, production and imported inputs) these variables were also deflated by Mexico's inflation. In some other cases INEGI's data was obtained on a monthly basis and they had to be annualized. In all cases, the information is exclusively for Mexico's manufacturing sector, not including *maquiladoras*. Only trade variables – the only exception – were obtained from Comtrade.

The methodology and model used for estimating the effects of Mexico's trade with China on its manufacturing sector is similar to the one used by Castro, Olarreaga and Saslavsky (2007), i.e. following Greenway et. al. (1998). We depart from a Cobb-Douglas production function for a representative firm i in time t:"

$$q_{it} = A^\gamma k_{it}^\alpha l_{it}^\beta \qquad\qquad (1)$$

where q is gross real production, k is capital stock and l units of labor utilized, and where α and β are the share of each factor used in production. Firms demand labor and capital until the marginal benefit of labor is equal to the cost of labor. (w) and the marginal benefit of capital is equal to the interest rate (c). Deriving the first order conditions for l in (1), we obtain the following expression:"

$$l_{it} = \beta p_{it} q_{it} / w_{it} \qquad\qquad (2)$$

where p is the price of the good i and w is the wage. Replacing (1) in (2) and rearranging the equation yields the following expression:

$$l_{it} = \beta p \left[\ Ak_{it}^{\alpha}l^{\beta} \ \right] \Big/ w_{it} \tag{3}$$

From the first order conditions of l, follows that,

$$\beta \, q_{it}/l_{it} = w_{it}$$

$$\beta Ak^{\alpha}l^{\beta}/l_{it} = w_{it}$$

thus, the derived labor demand for the industry i in time t can be written as:

$$l_{it} = \left\{ \ \left(\beta Ak_{it}^{\alpha}\right)\Big/ w_{it} \ \right\}^{(1/1-\beta)} \tag{4}$$

Taking logarithms and rearranging equation (4), we obtain the derived labor demand for the firm and thus industry i:

$$\ln l_{it} = \alpha_0 + \alpha_1 \ln K_{it} + \alpha_2 \ln w_{it} \tag{5}$$

In view that the technical efficiency of production increases over time and that the rate of technological adoption and increases in x-efficiency is correlated with trade changes, we assume that parameter A in the production function varies in the following way:

$$A_{it} = e^{(\lambda_0 T_i)}M_{it}^{\lambda_1} X_{it}^{\lambda_2}, \ \lambda_0, \lambda_1, \lambda_2 \rangle 0 \tag{6}$$

where T is a time trend, M is a measure of import penetration, and X is a measure of export penetration. This implies that labor demand for industry i in time t is:

$$\ln l_{it} = \alpha_0 + \alpha_1 \ln K_{it} + \alpha_2 \ln w_{it} + \alpha_3 \ln M_{it} + \alpha_4 \ln X_{it} + \alpha_5 T + \varepsilon \tag{7}$$

with:

$$\alpha_0 = \ln \beta / 1 - \beta$$

$$\alpha_1 = \alpha_0 / 1 - \beta$$

$$\alpha_2 = -1 / 1 - \beta$$

$$\alpha_3 = \lambda_1 / 1 - \beta$$

$$\alpha_4 = \lambda_2 / 1 - \beta$$

$$\alpha_5 = \lambda_0 / 1 - \beta$$

This implies that labor demand is a function of changes in industry capital, wages, imports penetration and export penetration. Formally,

$$L^* = L(K, w, M, X) \qquad (8)$$

Additionally we use equation (7) of lagged employment in logarithms as an explanatory variable. This and the the wage variable were introduced with respective lags in order to limit for endogeneity bias. A similar methodology can be found in Fajnzylber and Maloney (2000).

The main results for manufacturing employment show that (see Table 14):

- The "base model" presents in almost all cases the expected sign, although the statistical significance is sensitive to the technique for estimation and to the inclusion (or not) of fixed effects by industry through dummy variables.

- The lagged employment variable is always significant at the 1% level and positive, although the magnitude of the coefficient depends on the inclusion (or not) of the industry dummy. In cases with the dummy variable, the coefficient varies from 0.39 to 0.58. When the dummy is not included, the coefficient is close to 1.

- The hourly wage is always negative, although not always significant, especially in the case of GMM estimations where a higher efficiency in estimations is expected. The inclusion of the dummy variable for the industry is also sensible (the coefficient is close to –0.2).

- Production is positively associated with different degrees of significance, with the exception of the last two GMM models.

o When trade variables are included, it is more difficult to detect a trade pattern. First, import penetration is not always significant (only in regressions 1, 4, 5, 9 and 10) and the sign is not always as expected, i.e. negative.

o Imported inputs are never significant and the sign and coefficient do also vary substantially.

o On the other hand, the interaction of import penetration with the share of imports from the United States (not including *maquiladoras*) is always positive and significant in 7 out of the 9 regressions. This interaction captures the non-lineal effects of a variable that accounts jointly for the penetration of imports from the world and the share of imports from the US.

o In the cases in which time and industry dummies were included, as well as import penetration, both variables have the expected sign and are significant (regressions 1, 4 and 5), i.e. under *ceteris paribus* conditions, the growth of total import penetration has a negative effect on employment of -0.06 and -0.08%.

o Equations 1, 4 and 5 control by total penetration and imported inputs; when trade penetration of industrial goods from the US increases (or its share over total), labor demand in Mexico between 0.07% and 0.09%.

o When we include China with an important share of imports, we did not find definitive and significant results. Only in regression 3 did we find a weak and significant result with a negative relationship between the share of imports from China and employment in Mexico.

	-1 OLS	-2 OLS	-3 OLS	-4 IV	-5 IV	-6 IV	-7 IV	-8 IV	-9 IV	-10 GMM	-11 GMM	-12 GMM
Employment (-1)	0.585*	0.979*	0.983*	0.431*	0.397*	0.397*	0.984*	0.985*	0.985*	0.963*	0.955*	0.955*
	(-0.057)	(-0.009)	(-0.009)	(-0.087)	(-0.088)	(-0.088)	(-0.01)	(-0.01)	(-0.01)	(-0.054)	(-0.064)	(-0.064)
	-0.237*	-0.036*	-0.037*	-0.178	-0.200+	-0.200+	-0.023**	-0.026**	-0.026**	-0.118+	-0.14	-0.14
	(-0.060)	(-0.011)	(-0.011)	(-0.109)	(-0.11)	(-0.11)	(-0.011)	(-0.011)	(-0.011)	(-0.067)	(-0.10)	(-0.10)
Production	0.259*	0.031*	0.027*	0.299*	0.298*	0.298*	0.024**	0.024**	0.024**	0.068+	0.054	0.054
	(-0.029)	(-0.009)	(-0.009)	(-0.041)	(-0.041)	(-0.041)	(-0.010)	(-0.010)	(-0.010)	(-0.034)	(-0.039)	(-0.039)
Total import penetration	-0.061**	-0.006	0.0010	-0.071*	-0.082*	0.014	-0.005	-0.002	0.008+	-0.291+	-0.198	0.017
	(-0.025)	(-0.01)	(-0.009)	(-0.025)	(-0.029)	(-0.018)	(-0.010)	(-0.010)	(-0.004)	(-0.154)	(-0.13)	(-0.032)
Total imported inputs	-0.011	0.001	0.001	-0.015	-0.012	-0.012	0.001	0.001	0.001	-0.013	0.002	0.002
	(-0.013)	(-0.003)	(-0.003)	(-0.015)	(-0.016)	(-0.016)	(-0.003)	(-0.003)	(-0.003)	(-0.020)	(-0.028)	(-0.028)
Total import penetration * import share	0.078*	0.013+	0.008	0.083*	0.096*		0.012+	0.01		0.309**	0.215+	
	(-0.024)	(-0.007)	(-0.006)	(-0.023)	(-0.025)		(-0.007)	(-0.007)		(-0.143)	(-0.11)	
Share of imports from China			-0.003+		-0.004	-0.004		-0.003	-0.003		-0.009	-0.009
			(-0.002)		(-0.005)	(-0.005)		(-0.002)	(-0.002)		(-0.016)	(-0.016)
Share of imports from USA						0.096*			0.01			0.215+
						(-0.025)			-0.007			-0.11
Constant	0.861+	-0.216*	-0.208*	1.634**	1.983*	1.983*	-0.126**	-0.136**	-0.136**	0.020	0.105	0.105
	(-0.519)	(-0.057)	(-0.057)	(-0.682)	(-0.715)	(-0.715)	(-0.061)	(-0.063)	(-0.063)	(-0.386)	(-0.414)	(-0.414)
Observations	439	439	428	391	384	384	391	384	384	439	428	428
R-squared	0.997	0.994	0.994	0.997	0.997	0.997	0.995	0.995	0.995			
Dummies	Time & sector	Time	Time	Time & sector	Time & sector	Time & sector	Time	Time	Time	Time	Time	Time

+ significant at 10%; ** significant at 5%; * significant at 1%
 Robust standard errors in parentheses
Time period: 1994-2003
Sectors: 49
ISIC revision 2, 4 digits

6. Conclusions and policy proposals

The Mexican government implemented an export-oriented strategy from the late 1980s based on macroeconomic stabilization, expecting that proximity to the United States, import liberalization and cheap labor power would be sufficient to develop a country with 105 million inhabitants. Most of the variables performed in the expected direction: a significant export-orientation was achieved, macroeconomic stability in Mexico became a symbol for most of Latin America and integration to the US market also allowed for significant growth in specific trade-related branches and sectors. From this perspective, most of the expected goals of the strategy were achieved.

On the other hand, both growth and development were only achieved in a limited way in the best of the cases. Even when comparing export-industrialization to prior decades of ISI in Mexico the results were not positive. Performance in terms of growth, employment generation and wages, but also consumption, investments, GDP per capita, technological development and absorption of export-oriented products and processes were disappointing; only some of these issues were addressed in detail in this study. As discussed in the first part, many of these gaps were the result of the processes and incentives inherent to export-orientation: the specialization in exports through imports to be re-exported characterized Mexico's engine of growth with few linkages, little employment generation and even fewer developments in R&D and technological spillovers. In addition, NAFTA allowed for an initial deepening of the regional integration process, but began to decline by the late 1990s: falling tariffs in the US and the practical abolition of tariffs in sectors such as electronics, as well as a massive shift of segments or production chains from the US to Asia and China resulted in the need to either enhance the regional integration process through new mechanisms – a "NAFTA plus" – or face the slowly declining weight of NAFTA.

It is in this context that China's fast and massive integration into the world market since the 1980s, but particularly since the 1990s, has played a substantial role in Latin America and particularly in Mexico. In quantitative terms China's increasing role in terms of GDP, trade, upgrading and long-term growth and development is substantial for Latin America and the world market in general. However, China presents a significant challenge for most of Latin America and particularly for Mexico from a more qualitative perspective: for more than 25 years it has outperformed Mexico while following an ideologically and conceptually different development path. China's GDP per capita performance during 1980-2006 was ten times higher than Mexico's. China's success, from this perspective, leads to a deep questioning of Latin America's and Mexico's export orientation and macroeconomic stability. Clearly, this is not only a matter of semantics and concepts. Up to now, China has continued to maintain massive public policies, in addition to substantial direct ownership and control over property, a fixed exchange rate, a planned economy and highly controlled markets including in trade, labor, services and capital, among others.

It is in this context that the bilateral relationship between both countries, while formally and diplomatically adequate, has been increasingly tense from an economic and trade perspective. Particularly for Mexico: China has become its second trading partner since 2003, while this is far less important for China. Important FDI from China – in sectors such as yarn-textile-garment, electronics and more recently in autoparts-

automobiles – present China as an "unexpected new neighbor" for Mexico. While these increases in trade and economic relations are indisputable, Chinese imports and competition in the US have been much more problematic. From this perspective, it is possible that in the short term, i.e. until 2008, the bilateral relationship worsens significantly, as a result of trade disputes within the WTO. Other topics such as illegal imports, triangulation and poor statistics have increased the tension between both countries. The difficulties in this bilateral relationship also increase in the most important export market, the United States. While exports have become increasingly significant for China, which has a relatively diversified export structure to the US, the EU, Asia and other nations, the US accounts for more than 85% of Mexican exports, i.e. it is the critical destination for Mexican exports and its strategy.

As discussed in more detail in section 4 of this study, China has been increasing exports to the US since the 1980s, and massively since 2001, displacing practically all other nations including Mexico. The Export-similarity Index and chapter-level statistics show that Mexico and China's main exports to the US, at least at the chapter-level, are relatively similar, i.e. it is not expected that the fierce competition with (and displacement of) Mexico in the medium run will change. In addition, estimates of the terms of trade based on US statistics show important benefits for China and losses to Mexico during 1990-2006. It is expected that autoparts and automobiles will be the next chains in which competition will increase in the next years.

Initial statistical analysis still presents substantial difficulties in measuring the impact of Mexico's trade with China on Mexican employment. Preliminary results so far estimate negative, but statistically non-significant, effects for 1994-2003. While this kind of modeling still requires important improvements, it is certain that in specific chains such as yarn-garment-textiles, the competition with Asian and Chinese legal and particularly illegal imports in Mexico's domestic market has been important and has effectively displaced Mexican production and employment. It is not difficult to understand that Mexico's 15:1 trade relationship with China in 2006, i.e. exporting 1 unit and importing 15, has generated massive displacement in terms of production and employment, although an increasing proportion of China's imports are also being used as inputs for exports (mainly to the US).

The initial findings regarding the unit value of US imports from China and Mexico, as well as the net barter terms of trade (NBTT) also show that China is competing with Mexico in the US market through lower unit values, and that this is affecting Mexico's NBTT in the US. The topic clearly requires further research, but apparently China has been successful in displacing Mexican exports through lower unit values and significantly affecting Mexico's NBTT in manufacturing.

In terms of policy proposals a few issues stand out. On the one hand, the need to promote FDI's potential in a development framework, i.e. FDI can clearly allow for development in terms of technology, employment, wages, and overall learning processes only if it is part of a larger socioeconomic strategy with specific instruments parallel to FDI flows. The lack of such instruments and an overall perspective does not allow for integration of these processes in terms of territorial endogeneity. Specifically for Mexico there have been no such policies to accompany FDI flows in terms of regional-sectoral policies in terms of technological development, training, specific support of particular products and processes, etc. The most recent document of the new government, the National Development Plan for

2007-2012 (PEF 2007), clearly reflects this perspective: macroeconomic stabilization in terms of fiscal and monetary policy are the basis for competitiveness, while other issues such as trade, industrial, regional and sectorial policies have been left aside since the end of the 1980s. Specific instruments, and costs in terms of programs and qualified personnel, are not envisioned in a framework of macroeconomic adjustment. Thus, the public sector at the municipal, regional and national level in Mexico should implement policies that allow such an integration process.

The bilateral relationship between China and Mexico is currently at a stage where strategic long-term decisions are needed. The trade and economic dynamic between the two nations does not coincide with their political and diplomatic weight, nor with the real and effective relationship that should exist between the two countries. Beyond debates on the "Chinese threat" it is essential that public, private and academic sectors seek to formalize the bilateral relationship with the People's Republic of China and be capable of overcoming the current incongruent relationship. From a Mexican perspective, China is not only Mexico's second trading partner, an active competitor in the domestic market as well as in the US market, but also a socio-economic gate to the Pacific and the twenty-first century.

Why is normalizing the relationship with China relevant? There are multiple benefits. In addition to being Mexico's second biggest trading partner and having a dynamism that exceeds that of Mexico's other trading partners, three aspects stand out. First, it is essential that Mexico take advantage of the enormous demand for imports in China. They are an important global exporter, and will soon become the main global exporter, and their imports show the same dynamics. However, Mexico has yet to take advantage of this opportunity. Secondly, regularizing the trade and economic relationship with Mexico would be significant, faced with the possibility that imports from China and the establishment of Chinese companies in Mexico could increase the competitiveness of Mexican production. In several sectors, from agriculture to science and technology, China has products, processes and experiences that are relevant to Mexico. This opportunity should not be rejected by Mexico, which is currently replacing US imports with Asian imports, particularly from China, and should instead be actively benefited from. Third, China has undoubtedly replaced an important sector of Mexican production, both for the domestic market and exports, especially those oriented to the United States, and therefore it is imperative that preparation measures be taken in the short, medium, and long term. Since the nineties, China has become a "global player"; the potential for strategic and short, medium and long-term strategies shows great opportunities and the need to take action before the implied challenges.

Mexico's current relationship with its second biggest trading partner is irregular and requires short, medium, and long-term solutions such as compensatory quotas. The current debate over whether or not to accept China as a market economy, timely debates in the WTO and multiple, international fora, among many others, all lead to the conclusion that greater institutional measures are required to improve and deepen the bilateral relationship, at least in socio-economic terms.

Two measures can be taken in the next years to overcome the bilateral impasse:

1. The creation of an Assessment Council. We propose the creation of an Assessment Council of the Executive, the Senate, and the House of Deputies on China. Its objective would be to serve as a center of information, analysis and proposals for the Executive, the Senate and the House of Deputies and would be made up of high level government employees, businesspeople, NGOs, and associations, as well as by a large group of experts and academics that would allow the proposals to be sustained in the bilateral relationship. Trade and economic aspects would be priorities, although it is also conceivable that other commissions would be created, tied to topics such as politics, culture, science, academics, sports, tourism, labor and migratory issues, sectorial and even "intersecretarial" issues. [36] The Council also ought to work in the same capacity for the Bilateral Mexico-China Commission. The Executive, the Senate, and the House of Deputies ought to provide sufficient financing for the medium-term functioning of the Commission, while specific projects could be financed by academic institutions and the private sector.

2. Strengthening of existing bilateral institutions. Today bilateral institutions – particularly the Bilateral Mexico-China Commission and its High-Level Group (GAL) – have pointed out relevant topics as discussed in the second section of this paper, but have lacked the political support in both countries to solve important issues in the short, medium and long-term. In the meetings of the various bilateral institutions they have already highlighted problematic issues such as illegal trade, industrial policy, R&D cooperation, tourism, visa problems and academic exchange, among many others. These topics such be solved in the very near future with financial support and adequate personal.

These measures should be taken in the very short term in several cases. As discussed in the document, several issues will arise in the bilateral relationship in the second half of 2007 and beginning of 2008 – particularly in the framework of WTO – that can generate massive obstacles and tensions. The proposal of China's President, in 2005 in Mexico, to create a long-term strategic relationship is still open and needs to materialize; otherwise the bilateral relationship could easily head for major conflicts.

References

Alvarez Medina, Lourdes. 2007. 'La industria automotriz China: Posibilidades de competir con la industria automotriz en México'. In Dussel Peters, Enrique and Yolanda Trápaga Delfín. *China y México: Implicaciones de una nueva relación.* La Jornada, Cechimex/UNAM, ITESM y Fundación Friedrich Ebert, México, pp. 191-208.

AMSDE (Asociación Mexicana de Secretarios de Desarrollo) 2007.

http://www.negociosmexicochina.com/home/home.asp, consultada en julio.

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[36] The NAFTA Assessment Council was made up of 20 people, including the chancellors of various universities, appointed by the Executive. This process without a doubt requires a greater opening to integrate other segments of Mexican society.

Anguiano Roch. 2007. 'Relaciones México-China en su perspectiva histórica'. In Enrique Dussel Peters and Yolanda Trápaga Delfín. *China y México: Implicaciones de una nueva relación*. Centro de Estudios China-México-UNAM, Fundación Friedrich Ebert, La Jornada e ITESM, pp. 25-50.

Arellano, M. and S. Bond. 1991. 'Some Tests of Specification for Panel Data', *Review of Economic Studies* 58: 277-297.

Bancomext (Banco Nacional de Comercio Exterior) 2007. *World Trade Atlas*. México: Bancomext.

Berg, Janine, Christoph Ernst and Peters Auer (eds) 2006. *Meeting the Employment Challenge: Argentina, Brazil and Mexico in the Global Economy*. Boulder Colorado: Ryenne & Lienner/OIT.

Berge, K. and T. Crowe 1997. 'The Terms of Trade Facing South Korea with Respect to its Trade with LDCs and DMEs'. Working Paper 12, Queen Elizabeth House, Oxford University.

Buitelaar, R. 1997, *La Posición de los Países Pequeños en el Mercado de las Importaciones de los Estados Unidos: Efectos del TLC y la Devaluación Mexicana*, CEPAL, Serie Desarrollo Productivo No. 39, Santiago de Chile, pp. 16 y 17.

CANAINTEX (Cámara Nacional de la Industria Textil). 2007. Several documents, http://www.canaintex.org.mx.

Cárdenas Castro, Hilda Lorena. 2006. *Competencia entre México y China en la cadena hilo-textil-confección en el mercado de los Estados Unidos (1990-2005)*. Tesis de Licenciatura de la Facultad de Economía de la UNAM, México.

Cárdenas Castro, Hilda Lorena y Enrique Dussel Peters. 2007. 'México y China en la Cadena Hilo-Textil-Confección en el Mercado de Estados Unidos'. *Comercio Exterior* 57(7): 530-545.

Casas Guerrero, Carlos. 2005. 'Estrategia de Promoción con la República Popular China'. Ciclo de Conferencias China-México/UNAM, November 16th.

Castro, Lucio, Olarreaga, Marcelo and Saslavsky, Daniel. 2007. 'The Impact of Trade with China and India on Argentina's Manufacturing Employment'. World Bank Policy Research Working Paper 4153.

CCS (China Custom Statistics). Various years. Commercial information. Hong Kong: CCS.

CNIV (Cámara Nacional de la Industria del Vestido). 2007. Several documents, http://www.cniv.org.mx.

Cornejo, Romer. 1985. 'Las Zonas Económicas Especiales en China'. *Estudios de Asia y África* 20(2).

—— 2005. 'México y la Competitividad de China'. In Sergio Casarín and Carlos Moneta (eds) *China y América Latina*, pp. 235-268. Buenos Aires: BID-INTAL.

Correa López, María Isabel y Juan González García. 2006. *Perfiles Recientes del Desarrollo Económico de China.* México: Universidad Autónoma de México/Universidad de Colima.

De la Calle, Luis. 2002. 'China en la OMC: Espejo para México', *Foreign Affairs en Español* 3: 152-161.

De León Ramírez, Carlos Alberto and Ángela Roxana Loyola de Hidalgo. 2005. 'Índices de Términos de Intercambio en El Salvador 1995-2004', *Documentos Ocasionales* 2005-02 (Banco Central de Reserva de El Salvador).

Diakosavvas, D. and P. Scandizzo. 1991. 'Trends in the Terms of Trade of Primary Commodities, 1900-1982: The Controversy and Its Origins', *Economic Development and Cultural Change* 39(2): 231-264.

Domínguez, Jorge. 2006. 'China's Relations with Latin America: Shared Gains and Asymmetric Hopes', Inter-American Dialogue Working Paper: Washington, D.C.

Dussel Peters, Enrique. 1999. 'La Subcontratación como Proceso de Aprendizaje: El Caso de la Electrónica en Jalisco (México) en la Década de los Noventa', *Desarrollo Productivo* 55: 1-69.

—— 2000. *Polarizing Mexico: The Impact of Liberalization Strategy*. Boulder, Colorado: Lynne & Rienner.

—— 2001. 'Un Análisis de la Competitividad de las Exportaciones de Prendas de Vestir de Centroamérica Utilizando los Programas y la Metodología CAN y MAGIC', *Estudios y Perspectivas* 1 (CEPAL): 1-57.

—— (coord.), Luis Miguel Galindo Paliza y Eduardo Loría Díaz. 2003. *Condiciones y Efectos de la Inversión Extranjera Directa y del Proceso de Integración Regional en México Durante los Noventa. una Perspectiva Macro, Meso y Micro.* México: Facultad de Economía/Universidad Nacional Autónoma de México, Banco Interamericano de Desarrollo-INTAL y Plaza y Valdés,.

—— 2005a. *Economic Opportunities and Challenges Posed by China for Mexico and Central America.* Bonn: Deutsches Institut für Entwicklung/German Development Institut.

—— 2005b. 'El Caso de las Estadísticas Comerciales entre China y México: Para Empezar a Sobrellevar el Desconocimiento Bilateral', *Economía Informa* (México) 335: 50-61.

—— (coord.) 2007. *Oportunidades en la Relación Económica y Comercial entre China y México.* México: CEPAL/Cámara de Senadores/SRE/CECHIMEX-UNAM.

2008. *Los Costos de Transporte de las Exportaciones Mexicanas.* Washington, DC: Banco Interamericano de Desarrollo (BID), To be published.

—— (coord.) 2008a. 'The Mexico-China Economic Relationship in Electronics: A Case Study of the PC Industry in Jalisco' Part of the ESRC-funded project *The Impacts of China's Global Expansion on Latin America.* Center for Chinese-Mexican Studies, National Autonomous University of Mexico. To be published.

ECLAC (Economic Commission for Latin America and the Caribbean) 2004., *Oportunidades y Retos Económicos de China para Mexico y America Latina,* Mexico: CEPAL (LC/MEX/L633)

—— 2007. *Anuario Estadístico de América Latina y el Caribe 2006.* Santiago: ECLAC.

Fajnzylber, Pablo and Maloney, William, 2000. 'Labor Demand and Trade Reform in Latin America'. Policy Research Working Paper Series 2491, World Bank.

Feenstra, Robert and Hiau Looi Kee. 2007. 'Trade Liberalisation and Export Variety: A Comparison of Mexico and China', *The World Economy*, 30(1): 5-21.

Finger, Michael. and Kreinin, M.E.M. 1979. 'A Measure of Export-Similarity and its Possible Uses', *Economic Journal* 89(356): 905-912.

GAN (Grupo de Alto Nivel China-México). 2005. *Notas de la Primera Reunión del Grupo de Trabajo de Alto Nivel,* January 24th.

Garza Limón, Cecilio. 2005. 'El Ambiente de Negocios en la República Popular China', *Economía Informa* 335: 24-30.

Gómez Cavazos, I. 2005, 'Condiciones y potencial de las relaciones México-Republica Popular China' *Economía Informa* 33: 5-10.

Gómez Izquierdo, José Jorge. 1992. *El Movimiento Antichino en México (1871-1934).* México: Instituto Nacional de Antropología e Historia.

González García, Juan. 2003. *China: Reforma Económica y Apertura Externa.* México: Miguel Angel Porrúa, El Colegio de México y la Cámara de Senadores.

Greenaway, David, R.C. Hine and P. Wright. 1998. 'An Empirical Assessment of the Impact of Trade on Employment in the United Kingdom'. Center for Research on Globalization and Labor Markets, University of Nottingham School of Economics.

IDB (Inter-American Development Bank). 2005. *The Emergence of China. Opportunities and Challenges for Latin America and the Caribbean.* Washington, DC: IDB.

IMF (International Monetary Fund). 2006. 'Mexico: Selected Issues'. IMF Country Report 06/351. IMF. Washington, DC.

INEGI (Instituto Nacional de Estadística, Geografía e Informática). 2007. Several documents from http://www.inegi.gob.mx/inegi/default.aspx.

Kaplinsky, Raphael. 2006. 'Revisiting Revisited Terms of Trade: Will China Make A Difference?' *World Development* 34(6): 981-995.

Kaplinsky, Raphael and A. Santos Paulino. 2005. 'Innovation and Competitiveness: Trends in Unit Prices in Global Trade', *Oxford Development Studies* 33 (3-4): 333-355.

Kaplinsky, Raphale and A. Santos Paulino. 2006. 'A Disaggregated Analysis of EU Imports: Implications for the Study of Patterns of Trade and Technology', *Cambridge Journal of Economics* 30: 587-611.

Lall, Sanjaya and John Weiss. 2005. 'China's Competitive Threat to Latin America: An Analysis for 1990-2002'. Working Paper 120 QEH Working Paper Series. Oxford: Queen Elizabeth House.

León Pacheco, Alejandra and Enrique Dussel Peters. 2006. 'El Comercio Intraindustrial de México. Tendencias Generales y con los Estados Unidos y China (1990-2004)'. Texas: Federal Reserve Bank of Dallas.

López Córdoba, Ernesto, Alejandro Micco and Danielken Molina. 2005. 'How Sensitive are Latin American Exports to Chinese Competition in the US-Market?' Mimeo.

Luna Martínez, Sergio A. (2003). 'Mexico-US Integration and the Export Competition from China'. Presentation at University of Michigan Conference, US Economic Forecast and Consumer Outlook for 2004, mimeo.

Mahoney, Melissa, William Milberg, Markus Schneider and Rudi von Arnim. 2006. 'Spurring Growth Dynamics from Services Offshoring', pp. 1-11. Policy note, Schwartz Center for Economic Policy Analysis New York: New School for Social Research.

Maizels, Alfred. 2000. 'The Manufacturers Terms of Trade of Developing Countries with the United States, 1981-1997. 'Working Paper 36. Oxford: Queen Elizabeth House

Monitor de la Manufactura Mexicana. 2007. *Monitor de la Manufactura Mexicana* 6 (3). Centro de Estudios China-México/UNAM, Canacintra and CDE/UNAM, México.

Moreno-Brid, Juan Carlos, Estéban Pérez Caldentey and Pablo Ruiz Nápoles. 2004. 'El Consenso de Washington: aciertos, yerros y omisiones', *Perfiles Latinoamericanos* 24: 149-168.

Navarrete, Jorge Eduardo. 2007. *China: La Tercera Inflexion: Del Crecimiento Acelerado al Desarrollo Sustentable.* México: National Autonomous University of Mexico (UNAM).

Ocampo, José Antonio and María Angela Parra. 2003. *The Terms of Trade of Commodities In the Twentieth Century.* CEPAL Review 79, pp. 7-35.

Oropeza García, Arturo. 2006. *China: Entre el Reto y la Oportunidad.* México: UNAM,.

PEF (Poder Ejecutivo Federal). 2007. 'Informe Presidencia'. Anexo Estadístico. México: PEF.

Pescador Castañeda, A. 2004, 'China, un Nuevo Reto para la Política Exterior Mexicana del siglo XXI' in Instituto Matías Romero/SER, *Los retos para la Política Exterior de México en la Actual Coyuntura,* Mexico: Instituto Matías Romero/SER

Richardson, Harry. 1978. 'The State of Regional Economics: A Survey Article', *International Regional Science Review* 3(1): 1-48.

Ros, Jaime. 2007. *La Desaceleración del Crecimiento Económico desde 1982.* To be published.

SE (Secretaría de Economía). 2005. *Inversión de China en México.* México: SE.

Salinas de Gortari, Carlos. 2000. *México: Un Paso Difícil a la Modernidad.* México: Plaza y Janés.

Salinas de Gortari. 2004. 'Una agenda comercial para el largo plazo', *Foreign Affairs en Español* 4(1): 2-16.

Sarkar, Prabijit. 2001. 'The North-South Terms of Trade Debate: A Re-examination', *Progress in Development Studies* 1(4): 309-327.

Sarkar, Prabijit and Hans Singer, 1991. 'Manufactured Exports of Developing Countries and Their Terms of Trade since 1965', *World Development* 19(4): 1617-1620.

Sojo Garza Aldape, Eduardo. 2005. *De la Alternancia al Desarrollo: Políticas Públicas del Gobierno del Cambio.* México: Fondo de Cultura Económica,.

Torres, Luis Daniel. 2006. 'La hipótesis Prebisch-Singer y el Debate Estadísitco de los Términos de Intercambio'. Tesis de Licenciatura, Facultad de Economía, UNAM, México.

Trápaga Delfín, Yolanda y Enrique Dussel Peters. 2007. *China y México: Implicaciones de una Nueva Relación.* México: La Jornada/ITESM/CECHIMEX-UNAM,.

USGAO (United States General Accounting Office). 2004. *U.S. Customs and Border Protection Faces Challenges in Addressing Illegal Textile Transshipment*. Washington, DC: USGAO.

USITC (United States International Trade Commission). Several years. *Import and Export Data.* USITC, Washington, DC.

Villalobos, Angel. 2007. 'La Relación Comercial China-México'. In Enrique Dussel Peters (coord.). *Oportunidades en la Relación Económica y Comercial entre China y México*, pp. 113-124. CEPAL/Cámara de Senadores/SRE/CECHIMEX-UNAM, México,.

Villarreal, René and Ramiro Villeda. 2006. *El Secreto de China: Estrategia de Competitividad.* México: Ediciones Ruz.

Von Morgenstern, Ingo Beyer and Xiaoyu Xia. 2006. 'China's High-Tech Market: A Race to the Middle', *The McKinsey Quarterly* (September).

Watkins, Ralph. 2002. 'Mexico Versus China: Factors Affecting Exports and Investment Competition', *Industry Trade and Technology Review*, July: 11-26.

Watkins, Ralph. 2007. 'El Reto de China para la Manufactura Mexicana'. In Enrique Dussel Peters (coord.) *Oportunidades en la Relación Económica y Comercial entre China y México,* pp. 137-163. CEPAL/Cámara de Senadores/SRE/CECHIMEX-UNAM, México,.

WB (World Bank). 2007. *World Development Indicators*. Washington, DC: World Bank.

WTA (World Trade Atlas). 2007. México: Bancomext.

Zaga Kalach, Rafael. 2007. 'Oportunidades en la Relación Económica y Comercial entre China y México y su Contexto Latinoamericano: La Cadena Fibra-Textil-Confección'. En Enrique Dussel Peters (coord.). *Oportunidades en la Relación Económica y Comercial entre China y México* pp. 339-352. CEPAL/Cámara de Senadores/SRE/CECHIMEX-UNAM, México.

Zheng, Zhihai and Yumin, Zhao. 2002. 'China's Terms of Trade in Manufacturing', *Discussion Papers* 161 (UNCTAD).

Zhong Xiwei. 2007. 'Science & Technology Policy Reform and its Impact on China's National Innovation System', *Technology in Society*,29(3).

ANNEX

Chapter		1990-2000	2001-2006	1990-2006
1	Live animals	0.0	0.0	0.0
2	Meat	0.0	0.0	0.0
3	Fish and seafood	0.3	0.1	0.2
4	Dairy, eggs, honey etc.	0.5	0.2	0.3
5	Other of animal origin	0.2	0.3	0.3
6	Live trees and plants	0.3	0.4	0.3
7	Vegetables	0.0	0.1	0.1
8	Edible fruit and nuts	0.0	0.0	0.0
9	Spices, coffee and tea	0.0	0.1	0.1
10	Cereals	0.1	0.0	0.0
11	Milling; malt; starch	0.1	0.1	0.1
12	Misc grain, seed, fruit	0.2	0.3	0.2
13	Lac; Vegetable sap; extrct	0.3	0.6	0.5
14	Other vegetable	0.2	0.4	0.3
15	Fats and oils	0.1	0.2	0.2
16	Prepared meat, fish etc.	0.1	0.2	0.1
17	Sugars	0.6	0.6	0.6
18	Cocoa	0.3	0.2	0.2
19	Baking related	0.3	0.3	0.3
20	Preserved food	0.1	0.1	0.1
21	Miscellaneous food	0.2	0.3	0.3
22	Beverages	0.6	0.2	0.4
23	Food waste; animal feed	0.1	0.3	0.3
24	Tobacco	0.1	0.1	0.1
25	Salt; sulphur, earth, stone	0.2	0.3	0.3
26	Ores, slag, ash	0.1	0.0	0.1
27	Mineral fuel, oil etc	0.4	0.3	0.3
28	Inorg Chem; Rare earth mt.	0.1	0.2	0.1
29	Organic chemicals	0.1	0.1	0.1
30	Pharmaceutical products	0.1	0.1	0.1
31	Fertilizers	0.7	0.1	0.6
32	Tanning, dye, paint, putty	0.3	0.4	0.4
33	Perfumery, cosmetic, etc	0.4	0.4	0.4
34	Soap, wax, Etc; dental prep	0.2	0.3	0.3
35	Albumens; mod starch; glue	0.4	0.5	0.5
36	Explosives	0.0	0.0	0.0
37	Photographic/Cinematogr	0.2	0.4	0.3
38	Misc. Chemical products	0.1	0.2	0.0
39	Plastic	0.4	0.4	0.4
40	Rubber	0.4	0.3	0.4
41	Hides and skins	0.2	0.1	0.1
42	Leather art; saddlry, bags	0.3	0.4	0.4
43	Furskin and artificial fur	0.2	0.2	0.2
44	Wood	0.3	0.3	0.3
45	Cork	0.5	0.7	0.6
46	Straw, Esparto	0.4	0.3	0.4
47	Woodpulp etc	0.0	0.0	0.1
48	Paper, paperboard	0.3	0.3	0.3
49	Book + newspaper; manuscript	0.5	0.5	0.5
50	Silk; silk yarn, fabric	0.0	0.3	0.1
51	Animal hair+yarn, fabric	0.3	0.2	0.3
52	Cotton+yarn, fabric	0.1	0.1	0.2
53	Other veg textile fiber	0.2	0.1	0.1
54	Manmade filament, fabric	0.2	0.3	0.3
55	Manmade staple fibres	0.1	0.2	0.2
56	Wadding felt, twine, rope	0.2	0.3	0.3
57	Textile floor coverings	0.1	0.2	0.2
58	Spcl woven fabric, etc	0.3	0.6	0.5
59	Impregnated text fabrics	0.3	0.4	0.4
60	Knit, crocheted fabrics	0.2	0.3	0.3
61	Knit apparel	0.3	0.3	0.3
62	Woven apparel	0.3	0.3	0.3
63	Misc textile articles	0.4	0.5	0.4
64	Footwear	0.3	0.3	0.3
65	Headgear	0.3	0.4	0.4
66	Umbrella, wlk-sticks, etc	0.2	0.4	0.3
67	Artif flowers, feathers	0.5	0.2	0.4
68	Stone, plastr, cement etc	0.3	0.3	0.3
69	Ceramic products	0.2	0.2	0.2
70	Glass and glassware	0.3	0.3	0.3
71	Precious stones, metals	0.3	0.3	0.3
72	Iron and steel	0.2	0.2	0.3
73	Iron/steel products	0.3	0.3	0.3
74	Copper and articles thereof	0.1	0.3	0.3
75	Nickel and articles thereof	0.3	0.4	0.4
76	Aluminium	0.4	0.5	0.5
78	Lead	0.4	0.8	0.7
79	Zinc and articles thereof	0.6	0.3	0.4
80	Tim and articles thereof	0.8	0.3	0.7
81	Other base metals etc	0.2	0.2	0.2
82	Tool, cutlry, of base mtls	0.3	0.3	0.3
83	Misc art of base metal	0.3	0.3	0.3
84	Machinery	0.4	0.4	0.4
85	Electrical machinery	0.3	0.3	0.3
86	Railway; trf sign eq	0.4	0.5	0.5
87	Vehicles, not railway	0.1	0.2	0.1
88	Aircraft, spacecraft	0.1	0.4	0.3
89	Ships and boats	0.2	0.1	0.1
90	Optic, nt 8544; med instr	0.2	0.2	0.2
91	Clocks and watches	0.1	0.1	0.1
92	Musical instruments	0.2	0.4	0.3
93	Arms and ammunition	0.1	0.3	0.2
94	Furniture and bedding	0.3	0.3	0.3
95	Toys and sports equipment	0.4	0.5	0.5
96	Miscellaneous manufact	0.4	0.6	0.5
97	Art and antiques	0.3	0.4	0.3
98	Special Other	0.5	0.5	0.5
99	O Specl Impr Provisions	1.0	1.0	1.0

Source: Author, based on information from USITC (1991-2007)