

**Chinese OFDI and Trade with Mexico: some environmental and
social Dimensions**

**Claudia Schatan*
and
Diana Piloyan**

*** We thank Raquel Chuayffet for her intense and valuable work in the data processing.**

1. Introduction

This study has the purpose of exploring the unique characteristics of Mainland Chinese outbound foreign direct investment (OFDI) in Mexico and the peculiarities of trade between China and Mexico. In both cases, special attention is drawn toward environmental sustainability and social effects of such activities in the manufacturing sector in the latter country.

OFDI from China in significant amounts is a relatively recent phenomenon, it still concentrates in a small group of countries and it is not a constant flow. If the period 2005 ó 2012 is considered, the OFDI in the main destination countries took place mainly in one or two years, according to The Heritage Foundation.¹ During the last twelve years the main interest has been quite clear: between 2000 and 2011, 87% of OFDI went to energy and primary goods, while investment directed to manufacture and other activities were quite marginal (Dussel Peters, 2012b), though, at the same time, OFDI has tended to diversify and enter new fields. Latin America has been an important OFDI destination, receiving around 75 billion dollars between 2005-2010, mainly from State owned enterprises and with the support of China Development Bank and to a lesser extent with that of ExIm Bank of China and the Industrial and Commercial Bank of China (Gallagher, Irwin and Koleski, 2012).

The very quick rise of OFDI and its importance worldwide must be taken with caution, because it may not be a permanent trend in the near future. In a very recent Survey carried out by the China Council for the Promotion of International Trade (2013) and applied to more than 1000 enterprises from 15 states in Mainland China, the outlook is not very optimistic, since those enterprises whose revenues exceed 20% from their investments abroad are considering cutting down the latter in coming years, especially those from the private sector. 61% of the surveyed companies are in the manufacturing activity (CCPIT, 2013).

Mexico has had little relationship with China as a recipient of OFDI and as an exporter to China, while as an importer from that country it has become relevant and its increasing trade deficit has turned to be a concern for Mexican authorities. Until the mid 2000s, though quite unimportant as a Chinese counterpart, Mexico appeared as a different trading and investment partner to that country as compared with other Latin American nations, since most of its OFDI went to the manufacturing sector. But in recent years it has progressively moved closer to that of the South American profile. In fact, OFDI has risen considerably in the primary goods sectors, especially mining, as well as construction (of infrastructure) and the pattern of exports also has increasingly concentrated in primary goods, with some important exceptions. As a result of the recent energy law reform in Mexico, the absolute barriers to entry in oil producing sector by foreign direct investment have been lifted and China will most probably be interested in using this opportunity, so the pattern of OFDI going to Mexico and exports from Mexico to China may deepen the features acquired in recent years.

¹ The Heritage Foundation, *China Global Investment Tracker Interactive Map*
<http://www.heritage.org/research/projects/china-global-investment-tracker-interactive-map>

Independently of the understandable interest of China in Mexico's primary resources, both as a potential OFDI destination and as a greater provider of such resources through trade, as well as Mexico's interest in receiving greater support to enjoy the economic advantages offered by these sectors, Mexico may have certain conditions that can become increasingly promising for OFDI going to the manufacturing sector and bilateral trade of these goods between these two countries or with the United States. In fact, during the last two years, Chinese investment in the manufacturing sector has become more visible again.

There has been some interest in investing in Mexico by Chinese firms that stems from its strategic geographical location and its Free Trade Agreement with the United States and Canada. Exporting goods manufactured in Mexico and with enough NAFTA regional content has the benefit of facing lower tariffs in the United States, as compared with those that have to be paid if exported directly from China, besides other advantages as the lower transport costs, especially important for heavy manufactured goods.

However, such interest did not materialize until quite recently partly because producing goods in China at very low costs seemed a preferable alternative to that of producing them in Mexico, at higher costs and then sending them to the US markets. That is, the advantages offered by the special treatment provided by NAFTA to its partners, as well as other favorable aspects of producing in Mexico did not make up for the greater benefits provided by those producing in China.

In fact, with similar export profiles, Mexico and China became strong competitors in the United States market and during a good part of the 2000s, China was able to displace Mexico in numerous US markets, as has been seriously studied by Dussel Peters and Gallagher (2013).

This paper will mostly explore the characteristics and development of trade between Mexico and China, with a special focus on the manufacturing sector as well as the profile of Chinese OFDI in such activity. It will try to answer the question of whether these two elements have had a specific effects on the environmental and social conditions in Mexico.

The second section will look into the Trade between Mexico and China and its environmental and social (especially employment) effects on the former country; the third section will study the Chinese Outbound Foreign Direct Investment (OFDI) characteristics; the fourth section will address the Corporate environmental and social responsibility of Chinese OFDI and the fifth section will draw conclusions and propose some public policies for Mexico to face the challenges and take advantage of the renewed relationship with the Chinese economy, especially in the manufacturing sector, without deteriorating its environment and labor conditions.

2. Trade between Mexico and China

There has been a growing trade relationship between Mexico and China, though quite asymmetric. Since China joined the WTO in 2001, imports from China have increased at a very high speed, and from 2003 to present, China has become the second trading partner for Mexico (and the main importer and exporter worldwide). Mexico is now the largest importer from China in Latin America and the Caribbean (LAC), accounting for 48% of the region's total purchases, followed by Brazil (20%), Argentina (6%) and Chile (6%) (Osvaldo Rosales and Mikio Kuwayama, 2012). Mexican trade deficit with China has also increased enormously and it is a matter of concern for the former country.

In this section we will analyze the evolution of trade between Mexico and China, the trade agreements reached between them and some of the possible consequences of this intensified bilateral exchange both in environmental and social terms.

2.1. Mexico ó China Bilateral Trade

A first feature to underline in the Mexico-China bilateral trade is that between 2000 and 2012, the structure of exports from Mexico to China changed. While, on average, 87% of those exports had been manufactured goods in 2000-2002, this percentage had fallen to 55%, on average, in the period 2010-2012. Hence, primary goods are becoming considerably more important in the export sphere from Mexico to China. This is consistent with the fact that China has also been increasing considerably its investments in primary goods, mainly mining, and it influences this flow of goods to China too (see section on IED). This phenomenon certainly has an impact on environment, since the production for these exports are greater polluters, in general, than other activities.

A second aspect to be taken into account is the difference between the performance of Mexican imports from that of exports to China. Though exports to China grew at a higher average annual rate (34.1%) than imports (27.1%) between 2002 and 2012, exports were far from catching up with imports by the end of this period. In fact, though exports to China have become more relevant in total Mexican exports, they still are very marginal (they were only 0.2% in 2000 and in 2012 they had reached 1.5% of total Mexican exports) and imports rose from 2% to 7% of all Mexican imports from the world. At the same time, the Mexican trade deficit with China increased almost tenfold between 2002 and 2012, i.e., from 2.2 to 21.4 billion dollars (being the latter year one when Mexico experienced a surplus of 75 million dollars with the world) (Table 1). This fact has had an impact on employment, as we will see below. In fact, Chinese imports have had a significant negative effects on some manufacturing sectors in Mexico. Duran and Pellandra (2013) show that imports from China increased by 3.2 percentage points in Mexico's apparent consumption² between 2005 and 2010.

² Apparent consumption: production+imports-exports.

Table 1
Total Trade Between Mexico and China
(Millions of US Dollars)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Total Ms from China	2,845	3,215	4,815	5,370	8,606	11,496	13,624	12,084	17,565	23,550	27,151
Total Ms from the world	168,651	170,546	196,808	221,819	256,086	281,927	308,583	234,385	301,482	350,842	370,751
% Ms from China of Total Ms	2	2	2	2	3	4	4	5	6	7	7
Total Xs to China	653	969	475	1,131	1,687	1,887	2,052	2,205	4,191	5,963	5,716
Total Xs to the world	160,751	164,907	187,980	214,207	249,961	271,821	291,265	229,712	298,305	349,569	370,827
% Xs to China of Total Xs	0	1	0	1	1	1	1	1	1	2	2
Trade Balance (China)	-2,192	-2,245	-4,340	-4,239	-6,919	-9,608	-11,572	-9,878	-13,374	-17,587	-21,435
Trade Balance (The world)	-7,900	-5,639	-8,828	-7,612	-6,125	-10,105	-17,318	-4,672	-3,177	-1,273	75

Source: Project Database

Table 2
10 Mexican sectors with the greatest trade deficit with China in 2012
 (Billions of Dollars)

Sectors	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
SOUND RECORDER,PHONOGRPH	-167	-229	-470	-637	-1022	-1610	-2064	-1962	-2713	-3630	-3617
CLOTHNG,NONTXTL;HEADG EAR	-4	-29	-80	-122	-238	-635	-778	-1169	-1824	-2439	-2933
OFFICE MACHINES	-116	-151	-339	-356	-724	-1095	-1308	-1275	-1600	-1830	-1723
COPPER	1	6	-11	22	58	21	51	88	-29	-1170	-1273
AUTOMATC.DATA PROC.EQUIP	-168	-127	-207	-274	-448	-410	-567	-750	-894	-965	-995
TRANSISTORS,VALVES,ETC.	-65	-98	-164	-151	-245	-327	-356	-312	-425	-519	-582
ARTICLES,NES,OF PLASTICS	-104	-118	-125	-177	-251	-337	-462	-335	-412	-494	-535
LIGHTNG FIXTURES ETC.NES	-17	-19	-30	-39	-71	-112	-145	-125	-216	-345	-451
PRINTED MATTER	-49	-65	-83	-96	-138	-140	-135	-128	-182	-264	-450
METALWORKING MACHNRY NES	-10	-20	-44	-83	-146	-214	-251	-8	-327	-415	-449
Total	-699	-851	-1554	-1913	-3225	-4859	-6015	-5975	-8623	-12071	-13009

Source: Project Database

Table 3
10 Mexican sectors with the greatest trade surplus with China in 2012
 (Billions of Dollars)

Sectors	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
PASS.MOTOR VEHCLS.EX.BUS	0	23	0	13	46	95	58	115	548	798	855
ORE,CONCENTR.BASE METALS	7	3	-1	3	37	77	121	185	244	114	358
IRON ORE, CONCENTRATES	0	15	0	55	29	39	82	93	158	264	199
TELECOMM.EQUIP.PARTS NES	-55	-67	-84	-98	-140	-218	-153	-102	-124	45	153
ORGANO-INORGANIC COMPNDS	3	24	7	66	94	74	48	44	108	165	100
PLASTIC WASTE, SCRAP ETC	6	12	1	16	16	19	17	22	25	53	57
MEASURE,CONTROL INSTRMNT	3	3	-173	-229	11	6	9	18	26	31	48
PULP AND WASTE PAPER	0	0	0	0	0	3	20	4	19	44	33
SYNTHETIC RUBBER, ETC.	1	2	0	0	10	14	17	18	29	29	30
ANIMAL FEED STUFF	-1	-1	-1	-1	-2	-2	-4	-5	-4	-319	29
Total	-36	14	-251	-175	102	108	214	392	1028	1224	1863

Source: Project Database

The five greatest sources of deficit in 2012 were sound recorders, clothing, office machines, copper, automatic data processing equipment, transistors, valves, etc, and the ten sectors with the greatest deficit accounted for 61% of total Mexican deficit with China in 2012 (up from 32% on 2002) (see Table 2). Nine of these ten sectors were manufacturing ones.

In most of these cases, the initial deficit in 2002 was negligible, so the large surge in imports can probably be explained to a great extent by the easier access of Chinese products to the Mexican markets, especially from the mid 2000s and some after 2008 when the special transitional measures to restrain Chinese imports going into the Mexican market were eliminated. The greater integration of Mexico to international value chains also had a significant role in increasing imports from China, as inputs to be used in the assembly industry, especially in the electronics sector (see Table 2). The most important case is the transistors, valves, etc. sector (SITC three digit) which by itself explained 10% of total Mexican imports from China in 2012 and it had been only 0.1% in 2002.

Among the ten sectors that were the ones with the greatest surplus in their trade balances with China most of them were primary goods (minerals, animal feed) and wastes recycling, but some manufactured goods that had no weight at the beginning of the period rose to top places, such as the passenger motor vehicles sector, which climbed to the first place. Telecommunications equipment parts also was important and it had had a deficit until 2011 (see Table 3). These two last cases are encouraging because they show that it is possible to export high technology goods to China with high value added.

The deficit problem in Mexico's trade balance with China has occurred notwithstanding the agreement Mexico and China signed when the latter country joined the WTO and which granted the first country a 6-year transition period for phasing out its compensatory tariffs on Chinese products and a further three year trade remedy agreement.³ From then on, products from 14 sectors coming from China would be free of tariffs that ranged from 40 to 250%, which had been allowed by the transition agreement, and would hence pay only the amount required from such imported goods from non NAFTA trading partners.

Clearly, the transitional agreements just mentioned did not avoid the upswing in exports from China to Mexico. Complaints have been raised about several unfair practices, such as undervaluation, false origin declaration and distortion of goods description to avoid duties, as well as entry of Chinese exports via the United States, labeling them as made in that country⁴. It is estimated that 65% of domestic consumption of textiles and apparel was illegally imported, especially from China in 2007 (Dussel Peters, 2007; interview with CANAINTEX, 2013). This has unleashed a defensive attitude by Mexico because of the competition its productive sector has felt from Chinese imports (legal and illegal).

³ Over these three years, anti-dumping duties on China would be partly replaced by transitional duties, and finally these would be eliminated by December 2011, when such agreement was to finish.

⁴ A. Vazquez, H. López-Portillo, V. Vázquez-Bravo; How far is Mexico willing to go to protect itself from China?, International Law Office, <http://www.internationallawoffice.com/newsletters/detail.aspx?g=ccc3e33e-221a-44dd-abba-00290b32c6ca>

Since the end of the bilateral transition agreement there has been a rise in the number of trade remedy investigations against China⁵. In fact, Mexico has brought several dumping accusations against China before the WTO and levied numerous antidumping duties on Chinese imported goods, especially in the steel industry and the textile industry. Mexico's Economy Secretariat has been carrying out a large number of investigations on Chinese dumping and other unfair practices, responding to Mexican firm complaints against a variety of imports from China. Over the last two years, these investigations have included food blenders, galvanized steel mesh, sodium hexametaphosphate, ceramic and porcelain dishware, child bicycles, graphite electrodes, RG-type coaxial cables, steel chain, among others^{6 7}

In October 2012, Mexico requested the WTO to make consultations with China concerning several measures that China has supposedly undertaken direct and indirect support of production and exports of clothing and textile products. Mexico claimed that these measures would involve prohibited and actionable subsidies which contravene China's obligations under the Subsidies and Countervailing Measures Agreement, GATT 1994, the Agreement on Agriculture, and China's Accession Protocol.⁸

Notwithstanding these numerous tensions, there are some encouraging signs of cooperation among the two countries as, for example, the Agreement between the Government of Mexico and China's footwear industry (2012), which establishes the conditions for importing Chinese shoes into Mexico. It establishes import reference prices for Chinese footwear and when prices are below the reference price, mechanism of verification to detect under-invoicing practices can be undertaken and this can lead to the embargo of the merchandise and fines. A similar mechanism has been followed for textiles and clothing.

A Bilateral Commission Mexico-China was set up in 2003 (and had had five meetings by the end of 2013) as well as High Level Group (set up in 2013) between the two countries with the purpose of seeking new opportunities in trade, investment and cooperation. There have also been a number of bilateral agreements on different issues that may have helped ease the tense relationship between the two countries: an agreement to combat illegal trade and cooperation between Banco Nacional de Comercio Exterior (Bancomext) and Eximbank of China, as well as agreements on cultural, transport agreements, mining cooperation, etc. (Dussel Peters, 2012a, and interview with Secretary of Economics officials)

3.2. China-US-Mexico Trade

⁵ But demands from Mexico against Chinese unfair trade practices were quite common before the end of the transition agreement also (see Dussel Peters, 2009).

⁶ *México demanda a China ante OMC por textiles*; El Economista, 15/10/2012
<http://eleconomista.com.mx/industrias/2012/10/15/mexico-pide-china-explicacion-posibles-danos-textileras>

⁷ One of the latest of these measures were taken in mid 2013, when Mexico set duties on seamless steel tubes from China, because of allegations of unfair pricing practices by TenarisTamsa, a large steel tube manufacturer in Mexico. The tariff applied could be as high as 56% of the customs duty price after tax.

⁸ WTO, Mexico files dispute against China on alleged subsidies to clothing and textile products, http://www.wto.org/english/news_e/news12_e/ds451rfc_15oct12_e.htm

Bringing the US into the scene shows that Mexico is dealing with Chinese product competition not only domestically but also within the United States, since both countries have a similar pattern of exports to that market (Dussel Peters, 2009; Dussel and Gallagher, 2013). But China has penetrated the US market in an impressive way, so that in 2005 it became its second trading partner after Canada and it displaced Mexico to the third place. However it has not always been that way, because between 1990 and 2000, both China's and Mexico's exports to the US market were growing at high rates, and were increasing their share in it without any of them displacing the other (see Dussel Peters, 2009; Dussel Peters and Gallagher, 2013).

However, since 2000, the picture has changed. Dussel Peters and Gallagher (2013) (following Lall and Weiss, 2005), show that between 2000 and 2009, 81% of manufacturing exports from Mexico to the US (56% of the total) were under direct or partial threat⁹. These authors point out that 53 sectors are under triple threat from China, since the US is losing market in Mexico to Chinese exports and Mexico is suffering the same fate in the US markets in these same sectors. In fact, 12 of the 53 sectors under triple threat belong to the clothing and textile activities and another six to the electronics sector, both of which are labor intensive activities (see also Gallagher and Przecanski, 2010). The only sector which escapes such threat is the automobile industry, where Mexico is gaining greater market share in the US than China. Gallagher and Porzecanski (2009) emphasize the fact that the threat suffered from Chinese competition in Mexico covers a wide range of sectors, from the most basic to those that use high levels of technology.

Though discouraging, there are some positive signs, at least in the telecommunications and electronics sector. Though Mexico has lost ground in the US market, the fact that its electronic inputs imported from China grew so rapidly and that these are incorporated into final goods that mainly go to the United States, suggests that if there hadn't been this surge in these specific imports, Mexico could have lost greater ground in the US than it did (therefore it saved jobs in this way), but its insertion in the GVC is far from being ideal, since it concentrates in the assembly activity.

It is also important to consider that the period 2000-2011 includes different tendencies, and over the last four or five years, Mexico has been recovering its competitiveness in the United States (Duran and Pellandra, 2013; Watkins, 2013), even to some extent in areas where it was hit the hardest, as some textiles. In fact, overall, in 2011, Mexico had recovered its share in the US market to around 12% of total US imports (Watkins, 2013). The reasons for this, according to this author is that Mexico keeps having important comparative advantages such as: lower transportation costs; shorter time to get products to end market; better communication and supervision of producing processes; greater flexibility for production changes; clearer government regulations; greater intellectual property regulations. Mexico is most competitive in goods that have a high ratio of weight to value, such as motor vehicles, large screen televisions; large household appliances. Some

⁹ A country's exports in a certain sector are under total threat if China's market share in the export market is expanding and another country's share is shrinking; while partial Chinese threat exists if both China's exports are increasing their share in the exporting market and so are the other country's exports, but the first expands such share faster than the latter.

goods in which Mexico is competitive that are more quality intensive than the above, are: medical goods, process control instruments; and precision metalworking. Mexico also has an advantage in those sectors where firms need just-in-time delivery of inputs (Watkins, 2013).

The advantages Mexico offers has enabled the deep integration of manufacturing activities in certain sectors regarding the Mexican favorable conditions to produce and export to the US, helping it to keep or recover its presence in its Northern neighbors market. But the challenge ahead is enormous and the response Mexico can provide is uncertain. Though it is true that Mexico was able to keep its share of the US market over period if 2000 and 2012, China was able to increase its participation in the US market from 8% in 2000 to 18% in 2011.

3.3. Environmental impacts of Mexico-China trade

In this section we will look specifically into pollution (GHG) effects that Mexican production for exports to China has generated. We will distinguish between those emissions that expand as a result of the increase in exports (scale effect), those changes in emissions that resulted from the changing structure of exports during the period under study (composition effect) and finally, those that are attributable to technology innovations that helped curb GHG emissions (environmental technological effect).

10

For this analysis, we used the 3 digit SITC database for exports and the GTAP database for GHG emissions for 2004 and 2007 (both sources of data were provided by the Project organizers). From a list of 262 sectors, we focused on 164 for this analysis because exports were inexistent or under 10,000 dollars for the rest of them.

We decomposed the increase in GHG emissions that resulted from the rise of exports (between 2000/2002 and 2010/2012¹¹) from Mexico to China in three different components: a scale effect, a composition effect and an environmental technology effect¹²:

$$\Delta P = \{ [x_{i1} * (X_2/X_1)] * t_{i1} \text{ ó } (x_{i1} * t_{i1}) \} + \{ [(x_{i2} * t_{i1}) \text{ ó } (x_{i1} * t_{i1})] \text{ ó } [(x_{i1} * (X_2/X_1)) * t_{i1} \text{ ó } (x_{i1} * t_{i1})] \} \text{ ó } [(x_{i2} * t_{i1}) \text{ ó } (x_{i2} * t_{i2})]$$

¹⁰ Based on the methodology used by Schatan in "Mexico's Manufacturing Exports and the Environment under NAFTA", in *The Environmental Effects of Free Trade*, CEC, <http://www.ecolex.org/server2neu.php/libcat/restricted/li/MON-068387.pdf>

¹¹ Instead of taking the first and last year of the series, we averaged the three first years and the last three years to analyze the change in trade and emissions because of the very erratic behavior of the figures. These averages give us a more stable view of the trade and emissions behavior.

¹² To calculate the environmental technology effect we took the sectorial GTAP GHG information of emissions for each dollar produced for exports in 2004 and multiplied it by the 2000-2002 average exports by sector. We then took the GTAP information of GHG emissions for each dollar produced for exports in 2007 and multiplied it by the 2010-2012 average exports by sector. We calculated what the emissions would have been in 2010-2012 if the increase in exports would have emitted the same amount of GHG that in 2004. The difference between this value and that obtained applying the emissions of the latter period with GTAP 2007 is what we consider the technical effect.

$$\text{Scale effect} = \{[x_{i1} * (X_2/X_1)] * t_{i1} \text{ ó } (x_{i1} * t_{i1})\}$$

$$\text{Composition effect} = \{[(x_{i2} * t_{i1}) \text{ ó } (x_{i1} * t_{i1})] \text{ ó } [(x_{i1} * (X_2/X_1)) * t_{i1} \text{ ó } (x_{i1} * t_{i1})]\}$$

$$\text{Environmental technology effect} = [(x_{i2} * t_{i1}) \text{ ó } (x_{i2} * t_{i2})]$$

Where:

ΔP : is the pollution change between period 1 and period 2.

t_{i1} : Pollution index for sector i in period 1

t_{i2} : Pollution index for sector i in period 2

x_{i1} : manufactured exports of sector i in period 1.

x_{i2} : manufactured exports of sector i in period 2.

$$X_1 = \sum x_{i1}$$

$$X_2 = \sum x_{i2}$$

$$i = 1, 2, \dots, 164.$$

From Table 4 we can appreciate that total exports increased at a much higher rate (1280%) between 2000-2002 and 2010-2012) than manufacturing exports (774% in the same period). As a result, there was also a change in structure of exports as mentioned before, in favor of primary goods, whose GHG emissions are in general higher than most manufacturing activities.

The results show that there was an increase of 2286.6 million tons of GHG emissions (CO₂ equivalent) linked to the increase in Mexican exports to China during the period 2000/2002 - 2010/2012. Most of this rise was a result of the scale effect, i.e., the increase in exports, but the composition effect also caused an increase of exports emissions, because the structure of exports favored more polluting sectors. The environmental technological effect (i.e., the improvement in producing processes technology between 2004 and 2007, GTAP) had a partially compensating negative effect on emissions in the period considered. In fact, if the latter had not existed, the GHG pollution would have been 44% higher than what it actually was (see Table 4).

The manufacturing sector exports expanded its GHG emissions by half the rate of the expansion of total exports. This increase was the result of trade expansion, and the composition effect acted favorably against these emissions since they had negative evolution, i.e., manufacturing exports tended to restructure in favor of less polluting sectors. The environmental technology effect was also negative, helping compensate for the increase in GHG emissions derived from the scale expansion (see Table 4 and Chart 1)

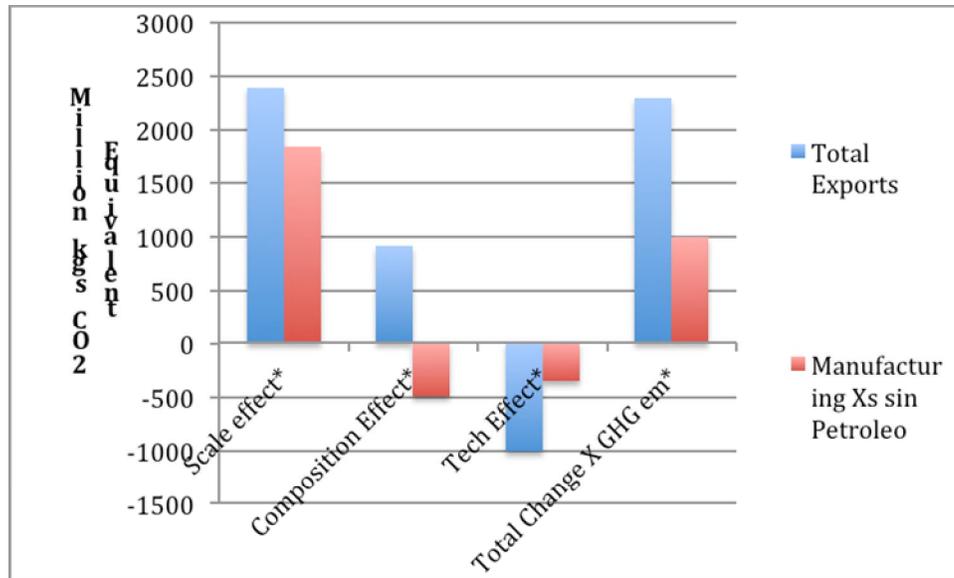
Table 4
Scale, Composition and Environmental Technology Effects
(between 2000-2002 and 2010-2012)

Variables	Total Exports	Manufacturing Exports
Change in exports (Millions US\$)	2957.4	1560.5
Change Xs %	1279.7	773.9
Scale effect*	2384.6	1843.7
Composition Effect*	912.3	-496.7
Tech Effect*	-1010.3	-353.2
Change in X GHG emissions*	2286.6	993.8
Change X GHG Emissions %	1227.1	689.8
% of X GHG emissions Scale Effect	104.3	185.5
% of X GHG emissions Comp. Effect	39.9	-50.0
% of X GHG emissions Tech Effect	-44.2	-35.5
% of X GHG emissions; Three Effects	100.0	100.0

* Measured in millions of Kgs, CO2 Equivalent.

Source: Project Database

Chart 1
Scale, Composition and Technical Effects



Source: Table 5

3.4. Social Effects of Trade between Mexico and China: Employment

The signing of NAFTA allowed Mexico to be very successful in some goods exports, especially in apparel exports to the United States, which helped that country expand its employment in that sector from 375,000 to 750,000 between 1994 and 2000. But over the next three years such industry lost about 230,000 jobs (Watkins, 2007)

The picture regarding the loss of jobs from Chinese competition at home and in the US may not be as bleak as thought until recently, but some labor intensive sectors will not be able to recover its manufacturing jobs of the end of the 1990s, as is the case of garment industry. Modern technology has widely been introduced in this sector in China, Mexico and worldwide, partly as a result of competition intensification since early 2000s. As mentioned before, competition mainly of Chinese textile and apparel products in the Mexican market and the displacement of Mexican products of this kind in the United States market since China entered the WTO in 2001 and with the end of the Multifiber International Accord (MIA) in 2005, there was a significant loss of jobs in Mexico in this sector.

As can be seen in Table 5, the Textile inputs, textiles and apparel industry lost 30% of its employment between 1999 and 2009 and, whereas in 1999 this sector absorbed 17.6% of total manufacturing jobs, this percentage fell to 11.2% in 2009, a strong contrast with Transport equipment production, which increased its employment from 4.8% 1999 to 11.2% of total manufacturing employment in 2009. Within the aggregated textile inputs, textiles and apparel sector, it was in textile inputs and apparel where the greatest number of

jobs were lost in the period 1999-2009: more than 110,000 in each of these two sectors, while textile production, after an initial fall, recovered by 2009. It must be noted that apparel had its greatest jobs loss after 2004 (with the elimination of the MIA).

As to other sectors employment harmed in some way by Chinese competition, we know that many information and telecommunications technology (ICT) companies from the US moved to China since 2001 electronics international crisis started and so did many firms that had been operating in Mexico in this activity. According to information from INEGI Input ó Output matrices, between 2003 and 2009, around 45,000 jobs were lost in this activity in Mexico (Schatan, 2013).

Table 5
Mexico Employment Indicators by Sector

Economic Activity	Employment by sectors			% of Total			Rate of Growth	
	1999	2004	2009	1999	2004	2009	1999/2004	2004/2009
Food Industry	652343	695523	833400	15.41	16.57	17.88	6.62	19.82
Beverages and tobacco industry	138954	149528	163937	3.28	3.56	3.52	7.61	9.64
Textile inputs, textiles and apparel industry	742986	617850	521433	17.56	14.72	11.19	-16.84	-15.61
Leather products and similar products, except clothing	151019	118228	140324	3.57	2.82	3.01	-21.71	18.69
Wood industry	81921	70686	85217	1.94	1.68	1.83	-13.71	20.56
Paper industry	79850	92411	101195	1.89	2.20	2.17	15.73	9.51
Printing and linked industries	142759	105946	131209	3.37	2.52	2.82	-25.79	23.85
Production of oil and carbon derivatives	50707	45485	32371	1.20	1.08	0.69	-10.30	-28.83
Chemical industry	213670	203274	233208	5.05	4.84	5.00	-4.87	14.73
Plastic and rubber industry	215478	211923	234936	5.09	5.05	5.04	-1.65	10.86
Production of non mineral products	200643	187188	215419	4.74	4.46	4.62	-6.71	15.08
Basic metal industry	44981	67176	81273	1.06	1.60	1.74	49.34	20.99
Metal products, machinery and equipment. Including surgical and precision instruments	1116349	801938	985239	26.38	19.10	21.14	-28.16	22.86

Transport equipment production	202459	512335	540436	4.78	12.20	11.59	153.06	5.48
Furniture and related products	132077	146654	160691	3.12	3.49	3.45	11.04	9.57
Other manufacturing industries	66126	172434	200774	1.56	4.11	4.31	160.77	16.44
TOTAL	4232322	4198579	4661062	100.00	100.00	100.00	-0.80	11.02

Source: INEGI

As to future Chinese exports competition in the Mexican and the US markets, it will be more difficult for it to occur mostly on the basis of low costs based on very low wages and very poor working conditions. The average real wages of the 700 million workers in China have multiplied by five over the last two decades. A great change in workers conditions in that country has taken place mostly over the last five years, as a result of deepening inequality in China which was causing discontent (there was a wave of strikes in 2010, mainly in the foreign owned firms), the more stringent availability of qualified labor to meet the growing domestic demand for it, causing an upward pressure on wages; more intensive trade union activity (they have been encouraged to create local branches); and an increase in the practice of collective bargaining. These changes have gone hand in hand with the greater importance given to domestic market since the world economic slowdown in 2008 and the need for achieving higher domestic incomes. These changes have also been backed by a modification of the legal framework: greater legal entitlements were given to Chinese workers, starting with the right of having a written work contract and raising officially the minimum wages. This gives workers the possibility of asking for sanctions against employers if they do not comply with their obligations (Brown, 2013). This does not mean that Mexico will not face competition from cheap goods coming from China, since this country is already outsourcing from other poorer countries in Asia, but the process is more complicated (they lack the infrastructure, the skills, the clusters that have been so successfully planned by Chinese system, etcí). The competition that is appearing from China will be increasingly from more sophisticated goods with greater value added. Hence Mexico needs to leap-frog in these kinds of goods as it has been doing in automobile and aerospace industries, with a greater integration of value chains at home.

3. Chinese Outbound Foreign Direct Investment (OFDI)

3.1. General Trends of Chinese OFDI

Mainland China had become the third largest source of foreign direct investment in 2012 after the United States and Japan and its importance is rising for developing nations in absolute and in relative terms compared to FDI coming from developed countries, which has fallen significantly (\$274 billion dollars just in 2012) (UNCTAD, 2013). The prospects for the FDI originating from the latter countries are not very encouraging, so China is becoming an important alternative source of funds for the developing world. In 2012, for the first time China invested more abroad than what it received from foreign investors. Though the preferred destination for OFDI has traditionally been Asia and Southeast Asia, lately European and North America have become attractive to these investors (CCPIT survey, 2013).

OFDI flows should be seen cautiously since both Chinese (OFDI) statistics and those of countries that receive such capital have several shortcomings. The Ministry of Commerce in China (MOFCOM) constructs the OFDI information but it has inevitable distortions because most of Chinese firms which invest abroad canalize their resources through Hong Kong, Macau and Taiwan and fiscal paradises. According to ECLAC (2011), 79% of OFDI was registered as going to Hong Kong (SAR), Cayman Islands and the British Virgin Islands in 2010 (ECLAC, 2011). So OFDI figures are imprecise and it is difficult to know the final use of this capital; in fact, part of it goes back to Mainland China (WRI, 2013; Lin, 2013; Dussel Peters, 2012b).

Notwithstanding these measurement difficulties, there is evidence that China's government has given wide support to OFDI, making use of the massive foreign currency reserves, to enterprises willing to make investments abroad. This has been stimulated especially since 1999 through the Going Global Strategy, which encouraged OFDI, including mergers and acquisitions (M&A) and "greenfield" projects overseas. This Strategy also aimed at opening the road for Chinese firms to access natural resources beyond its borders, as well as technology. The support given to OFDI by the Chinese government has included financial backing (through Export Import Bank¹³, the National Development and Reform Commission, NDRC, China Development Bank, and since 2003 has allowed commercial banks to also invest abroad), fiscal support, logistics help, preferential insurance coverage (through Credit Insurance Company, SINOSURE), among others (Dussel Peters, 2012; Dussel Peters 2013; ECLAC, 2010). The backing of OFDI has become more solid and, though still bureaucratic, it is now less so as the institution and regulatory framework for this purpose have been strengthening and the decision making has decentralized and made more agile. For example, in 2009 the rules for the Overseas Investment Administration were written and the Ministry of Commerce (Mofcom) decentralized the faculty of approving OFDI projects to local authorities (Dussel Peters, 2012a; Dussel Peters 2013). In 2013, the Tentative Measures for the Administration of Approval of Outbound Investment Projects were proposed to make it easier for outbound investments to be accepted,

¹³ In 2009 and 2010, China ExIm and CDB together lent more to developing countries than the World Bank (Dyer, Anderlini and Sender 2011; cited by WRI, 2013)

especially in the transportation and infrastructure projects, at the same time that they intend to simplify the procedures for the approval of investments below 100 million dollars by not requiring them to report to the National Development and Reform Commission (NDRC) beforehand¹⁴.

In general, Chinese OFDI is carried out mainly by three kinds of entities: state-owned enterprises (SOEs) and privately owned companies. China has the second highest number (50) of state-owned TNCs (World Resources Institute, 2013). The largest and most numerous OFDI have been done by SOEs, while the Chinese private sector had a more limited role as foreign investor. Also, SOEs investments were focused mainly in raw materials and energy, while private enterprises invested more in manufacturing industries and other services (Dussel Peters, 2012b; CCPIT, 2013). The motivation of OFDI (both for SOEs and, to a lesser extent, for private sector companies) has been changing through time, though. As shown by the CCPIT survey, 2013, and comparing the reasons for investing abroad, with those of their survey done by them in 2009, issues such as branding are becoming increasingly important in the effort of enterprises to become global, even more so than gaining greater market share in foreign markets, which was the higher priority in the survey of 2009. Enterprises find it very important to make their brands known abroad and even investing abroad so that their brands will become more appreciated at home. For private sector enterprises an important motivation to go abroad is to survive, given the difficulties they often find in the domestic market (CCPIT, 2013)

SOEs have had much greater official financial support than the private sector OFDI and have been able to have greater presence abroad: from 1056 enterprises surveyed by CCPIT in 2013, 333 had already made investments abroad, but a greater proportion were SOEs: 45% of these had invested in other countries, while 29% of the private sector firms had done so.

Another important feature of OFDI pointed out by the CCPIT survey (2013) is that many of the enterprises that develop an activity in China and invested abroad did not necessarily undertake the same activity outside China. Of the 333 companies investing overseas, 60% manufactured in China, but only 33% of these invested in manufacture abroad, while the rest mostly set up trade activities, probably trying to develop a market for their products outside China. The opposite happened with resources extraction, where a greater proportion of them implemented production activities abroad (13% of total companies with OFDI) than at home (9% of total companies with OFDI).

3.2. Characteristics of OFDI in Mexico

Mexico has been a very minor destination of Chinese OFDI up to now, even compared to other LAC countries. While Brazil received 28.2 billion dollars (more than half of it going to energy), Argentina 11.3 billion dollars (also mostly in the energy sector; but also 2.5

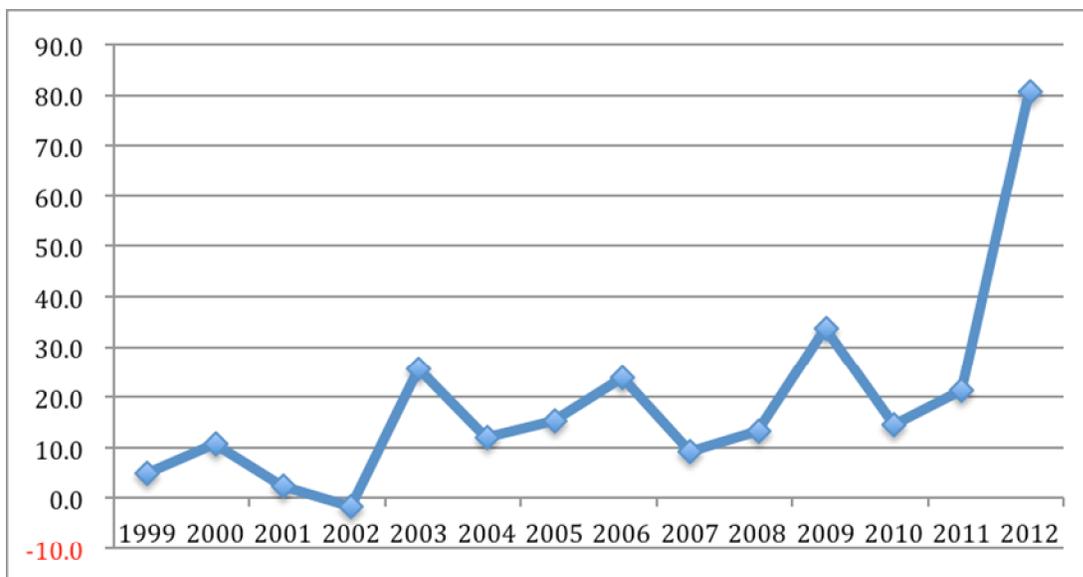
¹⁴ *Chinese Outbound Investment: The Growing Sophistication of China's Go Global Policy*, Andrew Lumsden, Corrs Chambers Westgarth, University of New South Wales, Sydney; <http://www.clmr.unsw.edu.au/article/risk/chinese-outbound-investment-growing-sophistication-chinas-go-global-policy>

billion dollars in the automobile sector), Chile 4.0 billion dollars (mainly in the mining sector), Mexico received only 530 million dollars (especially mining, but diversified, see below)¹⁵. According to Mexican records, Chinese OFDI in Mexico was only 270.5 million dollars between 1999 and the second quarter of 2013 (see Chart 2)¹⁶.

The presence of China in the manufacturing sector in Mexico may be underestimated by Mexican official figures, not only because of the already mentioned problems of Chinese capital sometimes being canalized through third countries to their final destination but also because of the way in which they are registered in Mexico. It is important to bear in mind that FDI coming to Mexico is measured through the flows of such capital received by enterprises in Mexico. A firm which has registered such flow can be considered to be at least partly Chinese. But there are other forms in which a firm can become of Chinese property in Mexico, as will be seen below.

Notwithstanding these caveats, by any standard, Chinese investment in Mexico has been very low and this contrasts with the fact that Mexico was the seventh transnational corporation (TNC) prospective host economy according to an UNCTAD survey in 2012 (UNCTAD, 2013).

Chart 2
Total Chinese OFDI in Mexico
Millions of Dollars



Source: Secretaría de Economía, Mexico.

¹⁵ Ibid.

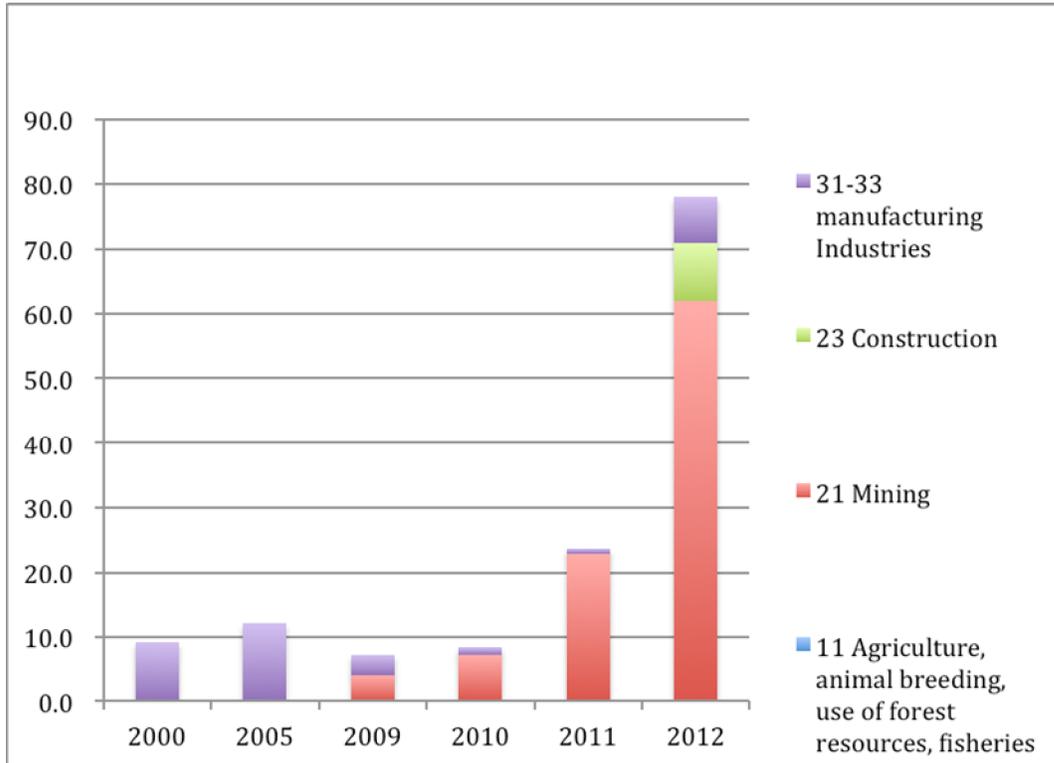
¹⁶ Note that there are differences in the way Chinese OFDI is registered by Chinese and Mexican authorities, so these figures do not coincide with those of the Mexico's Economic Secretary (which is about half the one reported by The Heritage Foundation).

At present, Chinese FDI in Mexico is on the rise, but this phenomenon is observed in the primary sector, especially mining and to a lesser degree in the construction sector, while OFDI going to manufacturing sphere is quite weak. This also contrasts with the fact that the manufacturing sector used to be OFDI's main destination in Mexico until the mid 2000s (see Chart 3).

The OFDI profile in Mexico is acquiring that of the Chinese FDI going to the South American countries, where mining and other primary goods are very attractive to such capital. It is interesting to note that OFDI in construction activities in Mexico have become relevant (more so than manufacturing) in 2012. This tendency is consistent with the structure of the new OFDI projects approved in China between 2011 and 2012, as compared to those registered in 2010. Lin (2013) shows that the proportion of projects going to Latin America in the extractive industry rose from 13% to 25% and the percentage of projects in the construction industry also increased from 5% to 13% of total OFDI projects in that region.

It is well known that China's increasing need for natural resources to sustain its extremely dynamic economic growth over decades led to impressive OFDI toward this sector abroad and that, partly to help these activities, Chinese construction investments in foreign countries recipients of OFDI in the primary goods sector followed suit or were parallel to the former. But what is also true is that while this process was under way, China developed impressive knowledge and capabilities to develop these kinds of activities efficiently and successfully. This, instead, is not precisely the case with most manufacturing activities, where China has gone global later and at a slower pace

Chart 3
Composition of Chinese FDI in Mexico
 Millions of Dollars

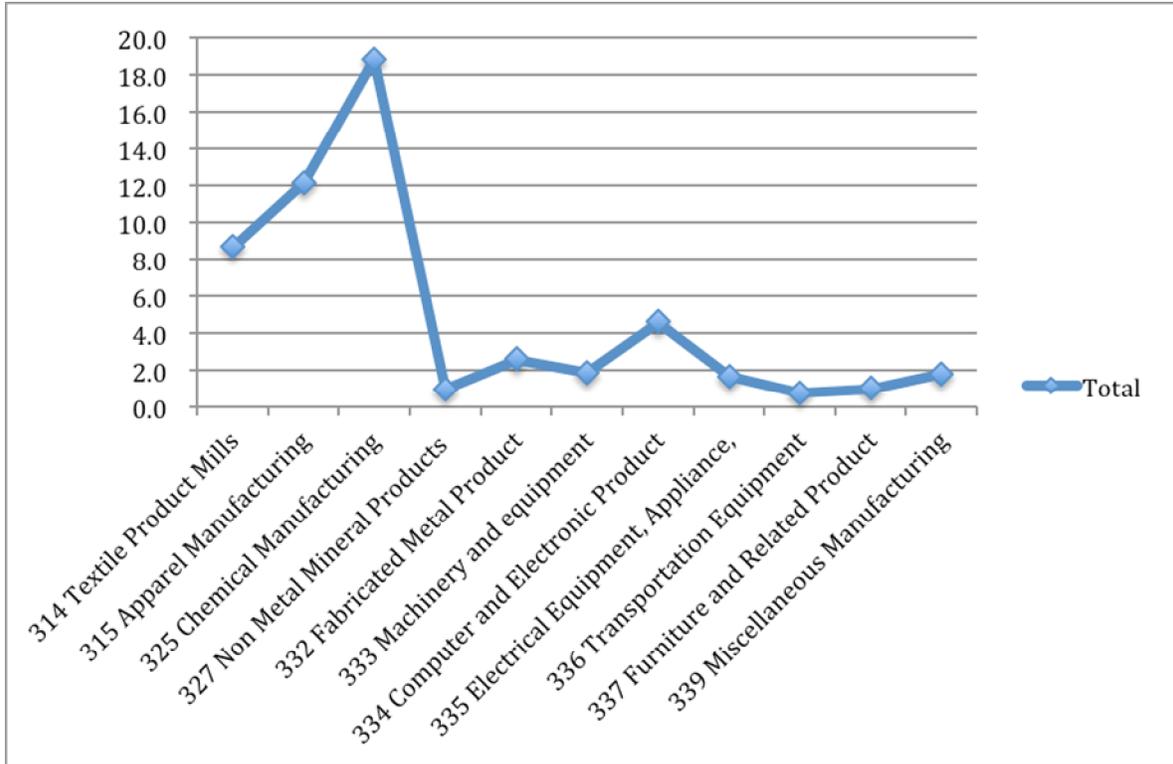


Source: Secretaría de Economía, Mexico
 Sector Classification: NAICS.

2.3. Present Chinese OFDI in the Mexican Manufacturing sector

Within the manufacturing sector, from Chart 4 we can see that Textiles, Apparel, Chemical Industry and Computer Electronics received the greatest amount of OFDI in the period 1999-2013 (up to the first semester), while the rest of the sectors have had very little investment from that nation. But, as seen in Chart 5, the first two sectors received OFDI in the first sub-period (1999-2005) and almost none in the second (2006-2013), probably as the result of the formal and informal opening up of the Mexican market for these products, which stimulated imports and discouraged their production in Mexico. In contrast, the OFDI going to Computer Electronics took place in the second period and only the chemical industry had a significant inflow of OFDI in both time spans.

Chart 4
Sectoral Chinese OFDI in Mexican Manufacturing, 1999-2013*
 Millions of dollars

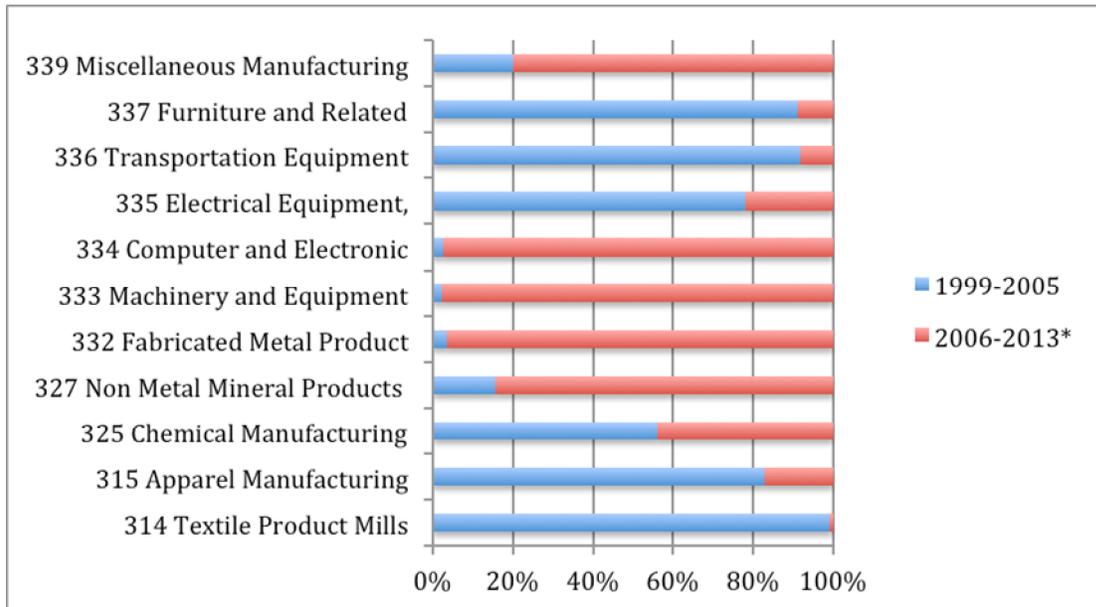


* Covers until the end of the first semester of 2013.

Source: Secretaría de Economía, Mexico

Sector classification: NAICS

Chart 5
Chinese OFDI in the Manufacturing Sector
 (%)



* Covers until the end of the first semester of 2013.

Source: Secretaría de Economía, Mexico

Sector: classification NAICS

Mexico, as a US neighbor and increasingly integrating to that country economically is potentially attractive for OFDI. The latter would be expected to find Mexico an interesting destination for investing in manufacturing, since China's end market for many of its products is the United States. Producing or assembling goods in Mexico to be exported to the US lately has made sense, as many enterprises in China are starting to experience rises of production costs there (as wages have risen about fivefold since the mid 2000s as well as a very sharp rise in land value, among other increasing costs). In fact, there is a tendency for US manufacturing firms in China to re-locate in their country of origin. This is because of the narrowing salary gap, also because of much higher productivity of labor in the US than in China, together with the revaluation of the renminbi, which makes exports more expensive; and the fact that transport costs and the time required to ship goods from China to the US continues to be a disadvantage for producers of exports in China (UNCTAD, 2013; Sirkin, Rose and Zinser, 2012).

In fact, Mexico has certain advantages that can attract enterprises not only of US origin but also from other parts of the world, whose end markets is the US. The benefits are particularly important for heavier products, such as automobiles, and its parts, TV monitors, among others, whose transport costs are high. By investing in Mexico, Chinese producers have the additional advantage of paying lower tariffs because of the NAFTA benefits and may avoid facing some countervailing duties for unfair trade practices that are charged to

them if exporting directly from China. This was the case of TV producers, such as Konka and TCL, which used to face tariffs that ranged from 4.4 to 78.5 per cent on its exports to the US and setting up enterprises in Mexico has avoided such obstacle ¹⁷.

Finally, there are some important agreements, such as the bilateral investment treaty (BIT) that was signed between Mexico and China in 2008¹⁸, which provides important legal guarantees for both parties. This BIT is considered to be a more advanced version of such agreements signed by China if compared with those reached before 2000, since it has similar characteristics to the western world ones. For example, it has a clause on minimum standard treatment, which recognizes the validity of customary international law and it considers national treatment (although not complete), among other things. This may encourage Chinese investments in Mexico (and vice versa) (Berger, 2013).

The limited flow of Chinese OFDI to the manufacturing sector in Mexico, according to some experts (Pro-México) is explained partly because their enterprises are quite inexperienced making business outside China. Mineral and oil extraction can be done efficiently by Chinese firms abroad and can be securely sold to the Chinese market itself, so it doesn't entail much risk. When constructing infrastructure abroad, the resulting construction does not need to be marketed, because its purchase is agreed upon in advance, so it also avoids several risks. Besides, China has advanced technology in both these activities. Chinese investment in the manufacturing sector abroad is a different matter: it is a relatively recent phenomenon and when its initiative comes from enterprises without prior or with little experience investing in third countries, there is a risk of being unsuccessful because of lack of knowledge of how things work in a different organizational and cultural setting, among other misunderstandings that may hinder efficient results¹⁹. For example, the effort Chinese automobile enterprises are making through A & M with other international industries to reach the scale and the capabilities required to be successful there, have frequently failed for lack of experience in this kind of situations, the clash of cultures, and the intricate relationship between firms and regulators in such country²⁰.

The former are some of the reasons why China's favorite manufacturing and other investment destinations in the third world are in Asia itself. Investments in Bangladesh, Burma, Pakistan, Sri Lanka, among others, have increased significantly over the last years and this is explained at least partly by organizational, cultural and other similarities.

When dealing with manufacturing international investments, China frequently looks for joint ventures, mergers and acquisitions, or strategic alliances with developed countries' companies because this paves the way for acquiring technology, market access and even cultural acquaintance of the firm with its surroundings. However, up to now there haven't been many joint ventures between OFDI and Mexican firms.

¹⁷ eltiempo.com, "Fabricas de televisores chinos se trasladan a México", 20 de mayo de 2004

¹⁸ http://www.economia.gob.mx/files/China_actual.pdf

¹⁹ Several interviews with different ProMexico and the Economics Secretary officials shared this view.

²⁰ Forbes, *Chinese Car Companies Risk Major Mistakes*, 20/04/2010, <http://www.forbes.com/2010/04/20/china-autos-geely-volvo-byd-daimler-baic-saab-hummer-markets-economy-acquisitions.html>

There are studies that show that in Europe the Chinese enterprises that are interested in participating in industries with certain knowledge intensity choose to undertake a joint venture with non-Chinese partners in order to learn from them, to share risks and ease their entry into local markets. Besides these advantages, they may transfer technology to their firms in China and move up the technology ladder in their production at home (Haiyan Zhang, Zhi Yang, Daniël Van Den Bulcke, 2013).

The way in which Chinese investment in manufacturing has been done in Europe is a good indication of what they may seek when making investments outside their homeland: by taking over existing European companies with well known brands and technological capabilities Chinese firms are able to upgrade their products and processes to higher value added activities in the home market. Chinese companies are under enormous pressure to move away from basic cost leadership positions by differentiating their strategies, and focusing on branding and innovation as determinants for future success on both the domestic and global markets. The acquisition of European brands and technology is regarded as a shortcut for Chinese companies not only to differentiate them from their domestic competitors, but also to compete in the premium market segments that are typically dominated by European and Western companies²¹. At a time when the developed world is in crisis, Chinese firms have acquired important businesses with such profile (especially in Europe, but also the US). Countries like Mexico do not offer such opportunities and it is likely to receive OFDI of Chinese firms that have already made joint ventures with developed countries' enterprises (through M&A).

It must be pointed out that these M&A and other sorts of association between Chinese and developed country firms not only are a result of elements already pointed out, but also the logical outcome of the vulnerability of developed countries' firms that, after China joined the WTO in 2001, face strong competition from Chinese products that had previously been left out of many markets. Therefore there is a strong motivation of threatened enterprises to merge with Chinese firms too.

There are other elements which played an inhibiting role in the flow of Chinese OFDI to Mexico's manufacturing (and other) sectors, namely, the trade tensions between the two countries. Since Chinese investment abroad is mainly made by Chinese public enterprises, and, at any rate both public and private firms require the consent of several public institutions to make them possible, tensions between governments may have a direct effect on most other relationships, especially the economic ones (Dussel, 2013).

A practical strategy followed during the last months by Mexico to surmount these government to government problems, has been to widen the cooperation institutionalization between the two nations. For this purpose they have revived the High Level Group (HLG) that was created by the Mexico and China in 2004 to discuss and explore closer relationship in five areas: Trade and investment promotion; Statistics and Trade Cooperation;

²¹ Haiyan Zhang, Zhi Yang, Daniël Van Den Bulcke (2013), Euro-China Investment Report 2011-2012, Antwerp Management School, University of Antwerp
http://www.antwerpmanagementschool.be/media/294010/report_exec_summ_english.pdf

Cooperation in the mining sector; Industrial Cooperation; the state of market economy and a mechanism for an academic dialogue. Two new HLG were created in recent months: one to explore investments, by which they are planning to generate a Common Fund for new investments in Mexico (the Mexican Ministry of Finance, the Development Bank of China and the Mexican Bank are involved). The main areas for future projects are mostly in energy and infrastructure, but there could be support for the automobile value chain. Another HLG has been formed for the private sector enterprises to be in contact and jointly explore sectors where they could do business together²².

Having analyzed the different elements that may attract or discourage OFDI to the Mexican manufacturing sector, we can look more closely at the characteristics of this investment. For this study we were able to identify 38 manufacturing enterprises with Mainland Chinese capital in Mexico (see Table 1). Most of them were located within a list of more than 800 enterprises which have registered capital movements from mainland China, Hong Kong and Taiwan to Mexico over the period 1999-2012, while others were added not because they had capital flows but because they were partly or totally acquired by Chinese firms in third countries. As a result, these newly acquired enterprises that had subsidiaries in Mexico became partially or totally Chinese.

First of all, we can point out that the Chinese investment in the manufacturing sector in Mexico has been quite diversified: there are enterprises in the automobile industry, electric and electronics industry, textiles, apparel and shoe industry; plastic materials (including some for the automobile industry), metal products, recycling, products for the construction industry, among others (see Table 1).

The kind of investment is also varied: as said, part of OFDI has arrived to Mexico through Chinese companies that had already made joint ventures with other firms, especially from developed countries. There are also Chinese companies in Mexico that have not made any investment in the country, but because they have taken over another company elsewhere, the subsidiary in Mexico of the enterprise that has been bought, has become Chinese. There are several enterprises with Chinese capital in Mexico that fall in one of these two categories. This is the case of Lenovo, which bought the Personal Computer Department of IBM, and this important US enterprise in Mexico became Chinese. TCL-Thomson (TCL, Chinese, with majority ownership, and French enterprises Thomson, that merged with the purpose of producing TVs on a large scale and exporting them to the US, through Thomson's trade networks). Preh-Joyson (German enterprise, specialized in automotive electronics, bought by Joyson Group, which produced automotive parts, in 2012) built a stronger position in the international market as an automotive supplier group, as they combined the strong market positioning of Preh in Europe and North America and access to the quickly expanding Chinese market through Joyson²³. TK Minth (joint venture of Chinese Minth and Japanese Tokai Kogyo Co. Ltd. Firms) is another of these cases: the first is an auto parts maker and the second is a plastic and rubber products maker, and TK Minth produces plastic and rubber automobile parts; Minth is favored by Tokai's global

²² Interview with Economics Secretary officials.

²³ <http://www.prlog.org/12147592-preh-and-joyson-automotive-show-dynamic-growth-in-every-market.html>

resources and strategic partners²⁴. Foton, a very important truck and tractor Chinese producer at an international level, with one of its 23 subsidiaries in Veracruz, signed a joint venture agreement with Daimler, a German automobile industry, which will provide improved technology to the former and make it possible to diversify the range of products it makes. This will create an opportunity for the assembly of a wider range of trucks in Veracruz too, where Foton had operated since 2004²⁵. There are a few examples of joint ventures between Chinese and Mexican capitals, such as Giant Motors which invited Faw trucks to participate in the assembly of light trucks in Pachuca, Hidalgo²⁶.

There are also greenfield investments made by fully owned Chinese firms in Mexico in areas where China has had a long tradition and experience in manufacturing and master the technology, such as textiles or apparel; or in steel and metal products. Among the most important are SINATEX S.A. de C.V in Sonora, which is a yarn producer in the textile industry (see Box 1) and now a part of a very large Chinese conglomerate that operates in China and worldwide. In this category fall also two plants (Coahuila and Nuevo León) of Golden Dragon Precise Copper Tube. These firms produce copper tubes in Mexico with the aim of exporting to the US market, though it had to face antidumping measures from that country. Another case worth mentioning, HCP Packaging (packaging of cosmetic products), which though created in Taiwan has had its headquarters in Mainland China since 1995 and it established its fifth subsidiary abroad in Tamaulipas, Mexico, in 2009.

Another sort of Chinese firms in Mexico are those initially small in size, perhaps producing goods that originally were imported by them into Mexico, and have grown to be medium size. This is the case of Long S.A., which operates in Mexico City, and produces bicycles (20 different models) and motorcycles (30 different models) and its main market is the domestic one.

Finally, there are those very small Chinese firms that continue being family owned and small size.

²⁴ Minth and Tokai Kogyo form auto parts joint venture, in Plastic News, January 20, 2012
<http://www.plasticnews.com/article/20120120/NEWS/301209978/minth-and-tokai-kogyo-form-auto-parts-joint-venture>

²⁵ <http://t21.com.mx/terrestre/2013/06/18/foton-autorizado-vender-camiones-daimler-mexico>

²⁶ Dussel (2012).

Box 1**SINATEX S.A. de C.V.**

SINATEX S.A. de C.V. is a Chinese textile industry, specialized in yarn production which started operating in Ciudad Obregon, Sonora, in Mexico in 1999. It is the largest Chinese investment in Mexico. It has three mills for yarn production and has modern spinning machinery. Capital stock in this company is over 100 million US dollars, it operates 100,000 spindles and uses about 13,000 tons of cotton per year. This input is bought from two Northern Mexican States and it is also imported from the United States. SINATEX was set up mainly to export to the United States and in fact it sells 80% of its production abroad. Though most of its exports head to the US, it also does so to Canada, Central and South America and China. This company has a very diversified production (around 180 kinds of yarn), but the most profitable line of production is the ring spun that is mainly exported to the US.

The enterprise suffered a setback when the international Multifiber Agreement ended in 2005 because it used to have a fixed quota for its exports to the US, which was no longer in place after the end of such agreement. The fact that SINATEX is located within the NAFTA territory helps to compensate somewhat for this lost privilege because it is classified as an assembly industry (maquiladora) and hence does not have to pay tariffs when entering the US market, except for the value added in Mexico. It also has the advantage of being able to meet the rules of origin required for tariff exemption within NAFTA. Between 2004 and 2005 this enterprise invested 5,000 million dollars in new machinery and equipment to be able to improve its competitiveness to face the new challenges posed by a more competitive international market. The products of this firm can reach 5-25% the level of USTER 2001 (The USTER. STATISTICS are a practical guide to good textile practices in the field of yarn manufacturing).

SINATEX hires 400 Mexican and between 60 and 70 Chinese employees. There are about 100 engineers and technicians working in the production process and quality control. Though by law all textile workers in Mexico have to belong to the sector's trade union apparently this is not the case of the workers in this company.

Box 1 Continued

Notwithstanding its strengths, SINATEX went through several difficulties in 2008 and was acquired by a very large Chinese conglomerate, China Hi-Tech Group Corporation (created in 1998), which is a state-owned large-scale central enterprise supervised by The State-owned Assets Supervision and Administration Commission of the State Council (SASAC), and it was formed by the merger of several firms that were part of the former Ministry of Textile Industry. This company has 20 subsidiaries and 5 companies listed in the share market both in China and in Hong Kong; it has 50,000 employees. The conglomerate operates in a wide variety of markets: textile machinery (which is the most important activity), textile production and trade, new fiber materials, commercial vehicles and heavy machinery, real estate and culture creativity and finance and investment. SINATEX S.A. de C.V. is part of this conglomerate Aug. 2008, CHTC restructured Sinatex S.A. de .C.V.

From the former information, we can presume that SINATEX is a quite modern enterprise that uses technology that is not as harmful to the environment as that of the older textile industries. Most recent technology in this sector recycle water and recover dyeing and other chemicals used in the process of production. However, it is important to take into account that SINATEX is located in an area where water is very scarce. Still, the firm has to comply with the specific Mexican environmental norm for the textile industry (see section 4).

Sources: Lin Jian Hua (2007); <http://www.sinatexonline.com>; <http://www.chtgc.com/n150/index.html>; personal interview with the Trade Counselor of China in Mexico; personal interview with the head of CANAINTEX.

Almost half of the 38 Chinese enterprises in Mexico are assembly industries, which reflects the fact that most of this OFDI is motivated by the geographical location of Mexico and its advantages to enter the US market under the NAFTA privileges. The maquiladora industries range from large enterprises, several of them already mentioned, to much smaller firms, such as Dong Fang Apparel; S.A. de C.V., which only has 35 workers. Several of them do much more than assembling parts (like Sinatex SA de CV), but they fall under such category to be exempted from US tariffs.

The Chinese OFDI going to the manufacturing sector in Mexico, has frequently faced a variety of difficulties and, in fact, the have been several failed attempts. Among these are Foton Motors, in Coatzacoalcos (a successful one operates in Veracruz), which was set up to construct tractors for the rural sector (mostly assembly), but after finishing 290 pieces it closed down and moved to Brazil (this investment was planned to be 2000 million dollars and would have created 17,000 direct and indirect jobs). FAW had also committed itself in 2007 to make an investment of at least 100 million dollars and to produce 50,000 vehicles

in three years in Michoacan. However for a misunderstanding with its Mexican counterparts and unfavorable exchange rate variations it was dismissed. When Geely Holding Group Co. (China's largest private sector automaker) bought Ford's Volvo Group in 2009, it announced it would invest 270 million dollars in a new firm in León, Guanajuato, but it never did (Lin, 2013); Chamco- ZX Auto China also failed because of problems within these firms. Other investments by other Chinese manufacturers did not materialize either. Mexico has not been the only country in LAC) where Chinese investments have been announced and later did not materialize (ECLAC, 2010; ECLAC, 2013).

One of the manufacturing sectors that in theory would be very promising for Chinese OFDI in Mexico is the automobile and specially the autoparts industry, since Mexico has become a very important production and export platform, integrated to the NAFTA value chains and markets. Since China needs to expand its industry abroad Mexico is a promising location.

This sector has grown enormously in China in response mainly to the impressive enlargement of the domestic market and, in fact, in 2013 it became the most important automobile producer worldwide. Though entering this sector rather late, Chinese automakers are in the process of catching up quickly, developing their own technology, and their own brands, such as BAIC, SAIC, FAW, Geely, Chery, BYD and Foton (Dussel Peters, 2010). The process of acquiring the adequate size and developing advanced technology to be internationally competitive has not been easy at all for these enterprises, and the process is still under way, considering that the producers were rather small, fragmented and distant from one another in China until recently (Alvarez Medina, 2007).

The progress made is quite impressive, at any rate. In 2009, 21 Chinese automobile enterprises were among the 50 largest companies in this sector worldwide (Dussel Peters, 2012; Dussel Peters, 2010; Yin, 2010). Even so, the capacity to produce vehicles has not grown at the pace needed by the Chinese market and OFDI is now required to provide additional supply vehicles from abroad, as well as producing for third markets. The availability of human capital and many other elements needed to expand further this industry in China has reached certain limits for the moment and it is now their investments in third countries that will join the effort to respond to the accelerated increase of their domestic demand and gain markets overseas.

However, as already mentioned, the experience of OFDI in the automobile industry has met several difficulties in Mexico and there are better chances that investment in autoparts rather than in finished vehicle production will expand first. The foreign enterprises that investment in the vehicles industry in Mexico have to comply with demanding requirements, such as producing a minimum of 50,000 vehicles a year. Additionally, Chinese enterprises that could invest in Mexico find it more plausible to export from there to the rest of Latin America rather than to the United States, because of the high quality and environmental standards that they have to comply with in this latter country²⁷. Technologically, the Chinese enterprises in general, though there are exceptions, are still in

²⁷ Interview with ProMexico officials in China.

the process of catching-up technologically, and not quite ready to be competitive in the US (or Canadian) market.

Of course, the enormous demand for automobiles in China also offers an opportunity for other multinational corporations established in Mexico to sell their products in China. In fact, in 2013, Mexico exported 30,000 vehicles to China for the first time, and it was the highest value individual item of exports from Mexico to China in 2012 (see section 2)

As to the electronics production sector, the presence of Chinese enterprises is mostly of the joint venture kind or enterprises that have become Chinese through M&A at an international level. The Taiwanese FDI in Mexico is particularly strong in this area and it has an important cluster in Baja California, but ProMexico is exploring the possible contribution of new (mainland) Chinese investments in Mexico to integrate further the electronics value chain in the country.²⁸

In summary, OFDI in the Mexican manufacturing sector is diverse, though still very limited. The reasons for this are numerous: OFDI flow to Mexico has been inhibited by the government to government tensions derived from trade conflicts between the two countries, the different institutional frameworks in these nations, the scarce chances for Chinese firms to engage in the kind of joint ventures they are mostly interested in, the fact that their technology is somewhat behind the most modern and required to enter the US market; the obstacle posed by cultural and linguistic differences between them, among others.

2.4. OFDI in the Mexican Manufacturing sector and environmental and social aspects

Up to now Chinese investment in manufacturing in Mexico has not concentrated in very polluting sectors. From the group of 38 manufacturing enterprises with Chinese capital in Mexico, only four of them²⁹ have to report their emissions to Environment Secretariat (SEMARNAT), because they are part of the Pollutant Release and Transfer Registry (PRTR) (only the enterprises of environmentally sensitive sectors and large in size have to provide this information). Of the four enterprises that are part of RETC, one produces plastic packaging material for cosmetics, one makes plastic packaging material for industrial use; another firm produces computers and computer components and a fourth firm produces autoparts. There are few firms operating with combustion processes and many of the enterprises are of small size, so these could be the reasons why they are not listed in RETC.

As to the polluting emissions of manufacturing enterprises with Chinese investment in Mexico, Table 1 shows in its third column, GHG emissions (Kgs of CO₂ equivalent). Two third of these enterprises has less than 1 kg GHG emission for each dollar produced and almost one half of all enterprises have 0.5 GHG or less emissions per dollar. As a point of comparison, the most polluting sectors at an international level, considering all producing sectors, according to GTAP information for 2007 (the most recent available year), was the

²⁸ Interview with ProMexico Officials in Mexico City.

²⁹ HCP Packaging USA Inc, Lenovo, Plastico Gigante de Mexico; S.A. de C.V. and Preh.

production of live animals (9,94 kgs of CO2 equivalent), followed by wool and other animalsø hair (9,66); electric current (6,45); cereal preparation (4.27). Hence we can, in a very general sense, say that manufacturing enterprises with Chinese capital in Mexico are not remarkably polluting. Among the 38 companies, the ones that register the highest GHG emissions are a steel industry (1.66 kgs of CO2 equivalent), two metal products companies (Cylinders for engraving, products for printing enterprises with 1.66 kgs of CO2 equivalent), followed by a Paper, cardboard and cellulose paste products enterprise (1.34 kgs of CO2 equivalent), and some plastic producing firms (1.09 kgs of CO2 equivalent). It must be noted, though, that GHG emissions that are taken into account in this study are only a part of the emissions, since we are not considering the soil and water pollution that these enterprises are responsible for. We know that textiles, apparel and electronics may be quite damaging in this sense (Schatan and Castilleja, 2007).

Table 7
Enterprises that are Mainland China property and/or that received capital flows from that country during 1999-2012

Name of the Firm	Activity	State	Emissions kgs. CO2 equivalent per dollar
Acerotech; S.A. de C.V.	Steel Industry	Nuevo Leon	1.66
Asontech S.A. de C.V.*	Valve assembly plant	Baja California	0.53
Carrocerias y Remolques SA de CV *	Car Metal bodywork, lathe conversions	Baja California	0.39
Dong Fang Apparel; S.A. de C.V.*	Apparel assembly	Yucatan	0.53
Earth Recycle Inc.; S. de R.L. de C.V.	Paper, cardboard and cellulose paste products	Baja California	1.34
Fortune Plastic Metal de Mexico; S.A. de C.V.	Recycling of different materials	Chihuahua	n.a.
Fortune Plastic Metal de Mexico; S.A. de C.V.	Recycling of different materials	Tamaulipas	n.a.
Foton *	Trucks and agriculture tractors Assembly	Veracruz	0.39
Giant Motors	Light Trucks	Hidalgo	0.39
Gdl Yuncheng; S.A. de C.V.	Cylinders for engraving, products for printing enterprises	Jalisco	1.66
Godak-Mex; S. de R.L. de C.V.*	Broadwoven fabric mills, cotton (textile assembly)	Baja California	0.78
Golden Dragon Precise	Copper tubes	Coahuila	0.91

Copper Tube			
Golden Dragon Precise Copper Tube	Copper tubes	Nuevo Leon	0.91
HCP Packaging USA Inc	Plastics packaging materials & unlaminated film & sheets	Tamaulipas	1.09
Herramientas Cleveland; S.A. de C.V.	Cutting tools and special tools	Mexico City	0.66
Hisense *	Production of TVs among other electronic products	Mexico City	0.41
Industria Megacinta; S.A. de C.V.	Adhesivas tape	Mexico State	1.09
Jincheng Ronda; S.A. de C.V.	Motorcycle production	Tlaxcala	0.34
King Cordmex; S.A. de C.V.	Electric cables	Baja California	0.41
Konka *	Consumer Electronics	n.a.	0.41
Lenovo	Personal computers and iPhones	Nuevo Leon	0.41
Long; S.A. de C.V.	Bycycles and motorcycles	Mexico City	0.34
Mexico Curtain Wall System Engineering; S de RI de CV	Glass and Aluminium walls, doors and windows	Baja California	0.91
New Field de Mexico; S.A. de C.V.	Shoe manufacturing	Guanajuato	0.49
Plastico Gigante de Mexico; S.A. de C.V.	Plastic parts for industrial use (molded plastic through injection)	Chihuahua	1.09
Polygroup Industrias Mexico S.A. de C.V. *	Parts for Christmas trees & plastic small swimming pools	Chihuahua	1.09
Preh/Joyson *	Parts for automobiles' transmission systems (it includes thermic processes)	Nuevo Leon	0.39
Ranboy Sportwear; S.A. de C.V. *	Apparel (other exterior textile material clothing)	Baja California	0.53
Reciclamax Mexico; S.A. de C.V.	Recycling firm	Queretaro	n.a.
Rotomex Yuncheng; S.A. de C.V.	Cylinders for engraving.	Mexico State	1.66
Sinatex; S.A. de C.V. *	Yarn manufacturing	Sonora	0.78
Sinterama de Mexico S. A. de C. V. *	Yarn made from hard natural fibers	Tlaxcala	0.78
TCL-Thomson *	Consumer electronics (TV sets & DVDs)		0.41
Textiles de Guaymas; S.A. de C.V. *	Exterior apparel made from knitted yarn and other products	Sonora	0.53
Tk Minth Mexico;S.A. de C.V. *	Molded plastics for automobiles	Aguascalientes	1.09

Universal Scientific Industrial de Mexico; S.A. de C.V. *	Electronic parts and components	Jalisco	0.41
Yuanda Mexico S. A. de C. V.	Glass and metal new construction materials	Baja California	0.91
ZTE*	Smart Phones	n.a.	0.41

* Assembly Plants Status.

Source: Secretary of Economy, Mexico; GTAP/Boston University China-Latin America Project Databases (GHG emissions per dollar produced in 2007); and own research,

Although it was impossible to know for each Chinese manufacturing enterprise in Mexico what its precise environmental behavior has been, and we are relying on international indicators that may be a crude reference point, at least we can be sure that there is in the worst case, a heterogeneous situation.

Firstly, as was mentioned before, several of the important Chinese enterprises in Mexico are joint ventures or are acquisitions of third country companies, several of them from developed countries. This means that it is difficult to ascribe their environmental behavior to a pre-determined Chinese standard. In fact, in these cases, Chinese firms will be following technical and environmental procedures mostly inherited from the European, Japanese or US firms they have absorbed or merged with. In fact one of the purposes of these joint ventures is for Chinese firms to be able to master these new technologies, which are usually cleaner than more backward ones.

Second, even among those firms that have been fully owned by Chinese capital from the beginning there are some that have been environmentally ground breaking. For example, there are innovative enterprises with environmental contributions incorporated in their products. This is the case of Golden Dragon Precise Copper Tube. It uses core technology of high-quality refrigeration copper tube. It produces an efficient heat-transfer threaded pipe that the Golden Dragon developed independently and has contributed to reduce the volume of air conditioners by 25%, increased the energy efficiency by 15%, reduced the use of the copper pipe by 20% since 2000. Based on the technology, the Golden Dragon has possessed 98 Chinese patents, made six national standards, and formed the standard system of refined copper tube in the world.³⁰

HCP Packaging USA Inc, a cosmetic plastics packaging materials & unlaminated film & sheets, originally Taiwanese, but since 1995 has been owned by mainland Chinese capital, has numerous quality and environmental certifications: ISO 9001 in 1996 (ISO 9001 is ISO 9002 plus design and development); ISO 14001 in August 2002 (ISO 14001 includes environmental issues and recycling).

Third, there are three recycling enterprises among the 38 under study. Although we have no information regarding the emissions of these recycling enterprises, at any rate they have an

³⁰ Golden Dragon Won the "Anti-dumping War" in the U.S. State Intellectual Property Office of the PRC (SIPO), http://english.sipo.gov.cn/news/iprspecial/201309/t20130909_817185.html

environmental value for Mexico, since these sorts of enterprises are still scarce or insufficient in the country. China has an important role in terms of collecting plastic waste ó pet - in Mexico, and exporting it to China. The fact that these enterprises recycle this scrap in Mexico is helpful to increase the value added to these inputs in Mexico instead of only exporting and processing them in China. The potential is much greater, though, both for pet recycling as well as for metal scrap recycling (of which Mexico is also an important exporter to China).

Regarding social aspects, i.e., employment conditions, salaries, workers organization, etcí it was not possible to interview the enterprises listed in Table 7. However, as in the case of environmental performance, social conditions must be varied, considering several of the arguments just mentioned, in the sense that standards are frequently inherited from businesses acquired by Chinese capital or those with which they merge. For the purely Chinese owned firms the situation may be different. There are cases in which the proportion of local and Chinese workers seems too high, as in the case of SINATEX S.A. de C.V., in which almost one fifth of them are Chinese. There is considerable fear that Chinese migration, through their productive activities could displace Mexican workers and deepen the present employment scarcity. This fear also is the result of the considerable migration that accompanies important infrastructure and mining OFDI in African and Asian countries, which responds to the lower wages and poorer rights offered to Chinese workers as compared to locally hired ones. The opinions in Mexico differ: for a former Director of SINATEX SA de CV (Lin, 2007) obtaining a Mexican visa to come to Mexico to work is very difficult and delayed, hence even temporary permits for Chinese workers to come to Mexico is complicated. For some Mexican official, there may be a migration problem if the migration authorities are not careful once Chinese citizens enter the country to work³¹. They may stay legally doing their job, but become illegal once the permit ends because they decide not to return home. There also may be a different policy regarding trade unions, as was mentioned for the SINATEX SA de CV workers (Box 1). However, it may be possible that at least part of the need of fully owned Chinese firms to bring over numerous technician and even lower ranked workers stems not only from the possibility of paying them lower wages but from the fact that they can understand each other better, they are used to the organization of the Chinese firms, and culturally and linguistically they have greater synergies than with the Mexican personnel. As was alluded before, one of the big obstacles for Chinese firms to successfully carry out investments are cultural and organizational clashes.

2.5. Prospects for future Chinese OFDI in the Manufacturing sector en Mexico

Since the diplomatic relationship between Mexico and China started improving in 2012, reflected in the visit of Pdt. Enrique Peña Nieto to China and Pdt. Xi Jing Ping to Mexico, there has been a renewed interest by both countries to explore the possibilities of developing closer ties.

³¹ Interview with Economics Secretary officials.

Regarding investment, there are potential plans of Chinese investment in the mining industry at least in four states in Mexico (Chihuahua, Durango, Jalisco and Sonora), in renewable energy, also in four states (Coahuila, Durango, Oaxaca and Sonora)³², very important ones in infrastructure (expansion of Manzanillo port - dry port; construction of a Techno Park specialized in autoparts manufacturing; strengthen San Blasø port infrastructure; Mexico Istmo Puerto de América (from Oaxaca to Veracruz); automobile or autoparts for the automobile industry in six States (Aguascalientes, Colima, Durango, Sinaloa, Tamaulipas and Zacatecas); one project to produce leather for automobile interiors (Guanajuato); while only two projects exist for textile and electronics activities in two states (Durango and Tamaulipas, respectively); one steel industry in Colima and, finally two food projects: Chiapas (water farming and pork production; the latter in Sonora through acquisition of a US firm).

The prospects for OFDI going to Mexico may be improving. When Chinese businesses (both public and private) were asked what countries seemed attractive to them for OFDI, Mexico was ranked N° 30 among 67 classified countries, somewhat below Chile (which ranked N° 22) and Brazil (ranked N° 26), but above Argentina (ranked N° 62) and several other Latin American countries, according to the China Going Global Investment Index of the Economist Intelligence Unit (2013).³³

³² Mexico has an important infrastructure for the production of photovoltaic modules, greater than that in Brasil, Chile and Argentina. In 2010 Mexico was the leading investor in renewable energy in Latin America (ProMéxico, in E.Dussel Peters, Coordinator) Cuarenta Años de Relación entre China y México; Acuerdos, desencuentros y Futuro, Cechimex, <http://www.economia.unam.mx/deschimex/cechimex/chmxExtras/repositorio/archivos/40chinamexico.pdf>

³³ This Index combines opportunity and risk for 110 Chinese firms and characterizes the attractiveness of 67 countries, accordingly. http://www.eiu.com/Handlers/WhitepaperHandler.ashx?fi=China_Going_Global_English_version.PDF&mode=wp&campaignid=ChinaGoingGlobal

4. Corporate environmental and social responsibility of Chinese OFDI

4.1. Chinese environmental and social policies for its OFDI

Because of its still limited amount, Chinese OFDI it has not been an independent driver of environmental change in Mexico. However, the tendency to invest increasingly in the mining industry may have a greater adverse effect on environment, since this activity has serious problems in terms of water and soil pollution.

It is interesting to look at the recent development of environmental (and social) Chinese regulations for OFDI, and their domestic standards that may influence OFDI too. In fact, there are new environmental policies undertaken by the Chinese government for its investment going abroad as well as the important measures being introduced domestically to curb the acute pollution, with negative health consequences among the Chinese population.

China does not have a specific legal framework on environmental standards for its OFDI abroad, nor has it signed important international agreements that may guarantee environmental and other responsibilities, such as the OECD Guidelines on Multinational Enterprises.³⁴ However, it does follow environmental guidelines such as those of the World Bank³⁵ and other international institutions that provide loans or other financial support for their foreign investment (OECD, 2007). China has also expressed with increased frequency that there is a need for such country to expand its investment abroad and behave positively so that they may be stable and reliable in the long run, which includes being environmentally responsible (OECD, 2007). In fact, there is an increasing consciousness in the sense that environmental and social transgressions can end up in a failure of Chinese OFDI projects (and indeed it has happened) (WRI, 2013).

There are several Chinese institutions that intervene when financing or approving Chinese OFDI that can require such investments to comply with certain environmental and social standards. This is the case of the China Export and Import Bank, which has the *Guidelines for Environmental and Social Impact Assessments of the China Export and Import Bank's Loan Projects*, which, among other things, requires an environmental impact assessment (EIA), of the investment project. The loan contract can also include environmental and social responsibilities if considered necessary (WRI, 2013). The Industrial Bank of China became the first private Chinese bank to adopt the Equator Principles (in 2008), which is a risk management framework, adopted by financial institutions, for determining, assessing and managing environmental and social risk in projects and is primarily intended to provide a minimum standard for due diligence to support responsible risk decision-making (Equator Principles, <http://www.equator-principles.com/index.php/about-ep/about-ep>).

³⁴ These Guidelines require "establishing national contact points to promote and monitor guidelines applications" (OECD, 2007, Page 302).

³⁵ The International Finance Corporation (IFC), related to the World Bank, issued the "Performance Standards on Environmental and Social Sustainability" in 2006, and was revised in for the last time in 2012. (WRI, 2013).

Finally, the China Banking Regulatory Commission (CBRC) issued the "Green Credit Guidelines" (CBRC, 2012), which gives orientation on environmental and social risk management for lending both at home and abroad. It points out the important role that financial institutions have in the development of a sustainable and environmentally friendly economy, though it fails to put forward the mechanism of their applicability (WRI, 2013).

More recently, and perhaps more importantly, the MOFCOM has produced the *Guidelines for Environmental Protection in Foreign Investment and Cooperation* which is intended to "raise their environmental protection awareness, and to understand and observe environmental protection policies and regulations of the host country in foreign investment and cooperation, so as to realize mutual benefits" (MOFCOM, 2013). These guidelines encourage their enterprises in other countries to carry out Environmental Impact Assessment (Art. 8) according to the local rules; to train their personnel in environmental protection as well as in health and production safety, also in accordance with the host country regulations (Art. 7) and to prevent pollution, while the emissions they generate should be measured, monitored and make sure they do not exceed those allowed by local standards (Art. 10), and hazardous wastes should be managed adequately (Art. 13). The Guidelines show a strong stand on social responsibility, beyond the environmental aspect: Article 3, for example, states that "It is advocated that in the course of active performance of their responsibilities of environmental protection, enterprises should respect the religious belief, cultural traditions and national customs of community residents of the host country, safeguard legitimate rights and interests of labors, offer training, employment and re-employment opportunities to residents in the surrounding areas, promote harmonious development of local economy, environment and community, and carry out cooperation on the basis of mutual benefits".

Furthermore, since 2008, the MOFCOM has had a regulation allowing the government to fine companies up to Y1 million if starting an investment project abroad without the government's approval, including the commitment of respecting the host country's laws. There are several other institutions and their regulatory bodies that can have a say on the behavior of Chinese enterprises operating in third countries (WRI, 2013).

There are some environmental standards adopted in China in some specific sectors that may influence the production processes and products that they carry out in Mexico. For example, China adhered in 2000 to UNECE (UN Economic Commission for Europe) 1958 Agreement³⁶ which has a common set of technical prescriptions and protocols for motor vehicles including safety, energy saving, security and environmental standards (OECD, 2007).

The environmental guidelines for Chinese OFDI, the Chinese adherence to some international environmental protection agreements may be encouraging when thinking of

³⁶ "Agreement concerning the adoption of uniform technical prescriptions for wheeled vehicles, equipment and parts which can be fitted and/or be used on wheeled vehicles and the conditions for reciprocal recognition of approvals granted on the basis of these prescriptions" E/ECE/TRANS/505/Rev.2, amended on 16 October 1995, and several new regulations added over the years. (<http://www.unece.org/index.php?id=34079>)

environmental performance of Chinese investments in Mexico, but they are mostly voluntary.

When looking at the concrete corporate social responsibilities (CSR) of Chinese OFDI abroad there are signs of very uneven company policies. The CCPIT, 2013, report on a wide survey of Chinese firms with investments abroad finds that SOEs are stronger and more institutionalized regarding CSR as compared to private firms, although the latter have some positive indicator, as a greater communication with the stakeholders. A general result of the survey points at a much higher CSR in OFDI operating in the European Union and the United States than those in third world nations. Among these, the Chinese enterprises in East Asia and Southeast Asia have a better CSR record than those in LAC and only OFDI in Sub-Saharan countries seemed to have had a worse record in this matter than LAC. Therefore, CSR of Chinese enterprises abroad seems to respond to host countries' laws and regulations and not having its own improved targets in this area, regardless of where they operate. As it happens inside China, the survey finds that Chinese companies take abroad the image of important stakeholders from their homeland, being the governments and investors their most important counterparts, while local communities are mostly overlooked (CCPIT, 2013). Though the Survey does not show results of OFDI CSR by country, we cannot come to conclusions regarding Chinese CSR in Mexico. However, considering the requirements, laws and regulations developed by the latter country (see below), it is possible that their CSR is better than those followed by OFDI in other LAC.

As to future performance of OFDI regarding CSR abroad, there may be some not very desirable effects of the new regulations regarding the environmental protection in China, and which are expected to be enforced rigorously. During 2013 the NDRC adopted an aggressive environmental stand through at least three channels: it helped amend the Guideline Catalogue for Industrial Restructuring to stress the need for 'improving and upgrading the industrial structure' in order for firms to save energy and reduce emissions; it issued the Restructuring Plan on the Old National Industrial Bases (2013-2022) with the purpose of promoting their competitiveness and their access to new technology; and in the 12th Five-Year Plan period it started the National Low Carbon Tech Innovation and Model Industries Projects, including 34 model projects in the coal, electric power, construction and building materials industries.³⁷

China's Policies and Actions for Addressing Climate Change 2013 (NDRC) considers the adjustment of the industrial structure. It has 'raised the entry threshold for industries by enhancing the evaluation and examination for energy saving, and improving the assessment of environmental impact and the pre-examination of land resources for construction, to *strictly control the launch of the industries with high energy consumption, high emissions or excess capacity and exports of the products from high energy consumption or high emission industries.*'³⁸ (italics added). This criteria could make it difficult for enterprises to be set up or expanded, if they fit the latter profiles. By making explicit that energy intensive or very polluting enterprises that produce goods for exports will not be encouraged, some

³⁷ <http://en.ndrc.gov.cn/newsrelease/P020131108611533042884.pdf>

³⁸ Ibid.

producers in these activities may be driven to invest abroad since the required permits perhaps will not be obtained in China. A second point that may discourage production in these sensitive areas in China is that the costs they face are rising considerably because of the measures they must take to reduce pollution and remedy the damage they may have caused. There have been other requirements that also imply higher costs. In February 2013, Chinese authorities issued a new insurance program for highly polluting industries (chemicals, petrochemicals, mining and smelting) that ensures that these enterprises are able to compensate possible damages caused by them.

Given the described requirements in China, there may be a greater amount of Chinese OFDI going to more environmentally sensitive sectors, other than the traditional ones of mining and energy or especially the manufacturing industry that uses important combustion in their production processes. Some developing countries would probably be good hosts for these industries, but would suffer from more polluting economic activity. In the case of Mexico, its environment legal and regulatory framework would set relatively high environmental standards for these firms to operate and to be dissuasive. The problem with these industries is that, even if using the most modern technology, these activities are naturally more polluting than others (for example, metal and steel products, cement, chemicals, petrochemicals, etc.).

4.2 Mexico's Environmental policies and possible influence on incoming FDI environmental and social performance

Mexico has developed and progressively improved an environmental legal and regulatory framework for the protection of its environment, which makes it increasingly difficult for domestic and foreign investors to undertake activities, especially new ones, that may be very polluting. The country's first comprehensive environmental Law (Ley General de Equilibrio Ecológico y Protección al Ambiente³⁹) was signed in 1988, but it had to be deeply reformed in 1996, partly to make it enforceable (prosecution of transgressors was made possible through penal or administrative sanctions), to focus on a more comprehensive care for the environment (focused more on "quality" standards rather than "command and control" ones), to make the environmental impact assessment more targeted, but at the same time more effective and, finally, a greater participation of the community to raise their complaints was made possible through this new legislation (Schatan, 1999).

The institutional setting for designing and enforcing the environmental policy was the Secretary of the Environment, SEMARNAT, which has gone through some changes over the last 20 years, and the PROFEPA (Procuraduría Federal de Protección al Medio Ambiente) - linked to SEMARNAT. Profepa, which is the office of the environment Attorney (created in 1992) is the institution in charge of overseeing the enforcement of environmental laws and standards. According to the information provided by the

³⁹ <http://www.diputados.gob.mx/LeyesBiblio/pdf/148.pdf>

PROFEPA in June 2013, it had a census of 69,124 sources of pollution which are under its surveillance⁴⁰. Forty of these were automobile assembly industries.

As can be seen in Table 8, there are many Mexican Official Norms and other rules that have been enacted during the last 20 years and are meant to curb pollution of production sector. The Table shows general norms that put limits to manufacturing and other activities emissions and some specific ones that relate to some sectors, where several of the firms with Chinese capital operate in Mexico.

There are also some additional voluntary instruments which enterprises can adopt. The most important is the Programa Nacional de Auditoría Ambiental (PNAA) or Environmental Auditing National Program, which was created in 1992 as an initiative of PROFEPA. The latter gives enterprises a certification (Clean Industry; Environmental Quality and Tourism Environmental Quality) if they are prepared to be environmentally audited and comply with a specific program to improve its environmental performance and meet its agreed targets⁴¹.

Table 8

Main Mexican Official Norms with an effect on industries' environmental performance		
Area	Norma Oficial Mexicana (NOM) - Mexican Official Norm	YEAR
Nom on Residual Water	NOM-001-SEMARNAT-1996 QUE ESTABLECE LOS LIMITES MAXIMOS PERMISIBLES DE CONTAMINANTES EN LAS DESCARGAS DE AGUAS RESIDUALES EN AGUAS Y BIENES NACIONALES RECURSO E	1996
	NOM-002-SEMARNAT-1996 QUE ESTABLECE LOS LIMITES MAXIMOS PERMISIBLES DE CONTAMINANTES EN LAS DESCARGAS DE AGUAS RESIDUALES A LOS SISTEMAS DE ALCANTARILLADO URBANO O MUNICIPAL RECURSO	1996
	NOM-003-SEMARNAT-1997 QUE ESTABLECE LOS LIMITES MAXIMOS PERMISIBLES DE CONTAMINANTES PARA LAS AGUAS RESIDUALES TRATADAS QUE SE REUSEN en SERVICIOS AL PUBLICO RECURSO E	1997
Nom Fixed Sources	NOM-085-SEMARNAT-2011 NORMA OFICIAL MEXICANA NOM 085 SEMARNAT 2011 CONTAMINACION ATMOSFERICA NIVELES MAXIMOS	2011
	NOM-123-SEMARNAT-1998 QUE ESTABLECE EL CONTENIDO MAXIMO PERMISIBLE DE COMPUESTOS ORGANICOS VOLATILES COVS EN LA FABRICACION DE PINTURAS DE SECADO AL AIRE BASE DISOLVENTE PARA USO DOMESTICO Y LOS PROCEDIMIENTOS PARA LA DETERMINACION DEL CONTENIDO DE LOS MISMOS EN PINTURAS Y RECUBRIMIENTOS	1998

⁴⁰ Of these sources, 39, 406 generated hazardous wastes, 9, 553 of them were considered highly dangerous and 6, 145 sources had important emissions into the atmosphere.
http://www.profepa.gob.mx/innovaportal/v/663/1/mx/universo_de_atencion.html

⁴¹ Programa Nacional de Auditoría Ambiental http://www.profepa.gob.mx/innovaportal/v/26/1/mx/programa_nacional_de_auditoria_ambiental.html

	NOM-121-SEMARNAT-1998 NORMA OFICIAL MEXICANA NOM 121 SEMARNAT 1998 QUE ESTABLECE EL CONTENIDO MAXIMO PERMISIBLE DE COMPUESTOS ORGANICOS VOLATILES COVS EN LA FABRICACION DE PINTURAS DE SACADO AL AIRE BASE DISOLVENTE PARA USO DOMESTICO Y LOS PROCEDIMIENTOS PARA LA DETERMINACION DEL CONTENIDO DE LOS MISMOS EN PINTURAS Y RECUBRIMIENTOS	1998
	NOM-043-SEMARNAT-1993 QUE ESTABLECE LOS NIVELES MAXIMOS PERMISIBLES DE EMISION A LA ATMOSFERA DE PARTICULAS SOLIDAS PROVENIENTES DE FUENTES FIJAS	1993
Nom regarding hazardous wastes	NOM-161-SEMARNAT-2011 QUE ESTABLECE LOS CRITERIOS PARA CLASIFICAR A LOS RESIDUOS DE MANEJO ESPECIAL Y DETERMINAR CUALES ESTAN SUJETOS A PLAN DE MANEJO EL LISTADO DE LOS MISMOS EL PROCEDIMIENTO PARA LA INCLUSION O EXCLUSION A DICHO LISTADO ASI COMO LOS ELEMENTOS Y PROCEDIMIENTOS PARA LA FORMULACION DE LOS PLANES DE MANEJO (modificado tb 2013)	2011
Water National Commission Norm	Nom-007-Conagua-1997 REQUISITOS DE SEGURIDAD PARA LA CONSTRUCCION Y OPERACION DE TANQUES PARA AGUA	
Mexican Water Norm	NMX AA 008 SCFI 2011 ANALISIS DE AGUA DETERMINACION DEL PH METODO DE PRUEBA CANCELA A LA NMX AA 008 SCFI 2000 WATER ANALYSIS DETERMINATION OF PH TEST METHOD	2011
	ANALISIS DE AGUA DETERMINACION DE LA DEMANDA QUIMICA DE OXIGENO EN AGUAS NATURALES RESIDUALES Y RESIDUALES TRATADAS METODO DE PRUEBA CANCELA A LA NMX AA 030 1976CANCELA A LA NMX AA 030 1981 DEL 27 04 1981	2001
Textile Industry Nom	NORMA Oficial Mexicana NOM-CCA-014-ECOL/1993, que establece los límites máximos permisibles de contaminantes en las descargas de aguas residuales a cuerpos receptores provenientes de la industria textil *	1993

Source: PROFEPA

The fact that Mexico has joined important international and regional agreements has improved its environmental standards as well. By becoming a part of NAFTA, which includes an Environmental Side Agreement (ESA) with tools that offer cooperation among the three countries and a dispute settlement agreement as part of it, Mexico has both received support to improve its environmental standards and to enforce them, as well as to advance its capacity in many aspects of environmental protection. The dispute settlement mechanism deals with complaints against a party that show a persistent pattern of failure to effectively enforce its environmental law (Art. 22 of ESA). Even though ESA does not really have teeth to impose penalties (mostly fines) on governments of the country where the transgression is denounced, the investigations that may follow the complaints have been a very useful route to improve environmental performance (in some cases).

Also, there are many environmental cooperation projects that have been carried out by the Commission for Environmental Cooperation in NAFTA (created as part of ESA) that has helped Mexico to build databases polluting emissions that it did not previously measure. One of the most important initiatives is the Tracking Pollutant Releases and Transfers (TPRT, or RETC in Spanish) that started in 1995. This introduced a new instrument in

Mexico to measure the emissions of numerous industries and, though initially voluntary, it became mandatory in 2004.

Though NAFTA has several shortcomings regarding its environmental rules, among which the Chapter 11 Investment procedures or rules, by which investors may claim that they are being expropriated of their capital if new environmental standards are set that may affect their profits, the positive incentives of the environmental aspects of NAFTA outweigh the negative ones.

There has also been cooperation on specific productive sectors in North America to improve their environmental performance. This is the case of the automobile industry, for which the CEC is helping to extend the US Suppliers Partnership for the Environment initiative in that country to Canada and Mexico. The project is intended to generate a network of industry partners within NAFTA with the purpose of greening the industry suppliers⁴² <http://www3.cec.org/islandora/en/item/10869-project-summaries-2011-2012-en.pdf>.

Additionally, there have been other initiatives through CEC in NAFTA, such as the Sound Management of Chemicals (SMOC) which aims at phasing out the use of specific substances through the North American Regional Action Plans (NARAPs). Two of these NARAPs are meant to eliminate or reduce considerably the use of mercury (in two phases) and another will also try to do the same with lead (CEC)⁴³. Both of these substances are used in the production or assembly plants of electronic goods (Schatan and Castilleja, 2005).

The budget assigned to environmental law enforcement in Mexico grew from 6.6 billion dollars to 77 billion dollars between 1988 and 1993. The number of environmental inspectors rose considerably and 16,000 assessments of industrial plants and 2000 of them were temporarily closed and 200 were temporarily closed between 1992 and 1994. There have been numerous US-Mexico environmental cooperation programs in the northern border of Mexico to improve environmental conditions, including pollution control, Mexico also has received support from international financial institutions, such as the World Bank, from which it received a loan for 1.8 billion dollars to improve the environmental laws enforcement in the border region. The North American Development Bank (NAD Bank) and a Border Environmental Cooperation Commission (BECC), have also financed programs for these purposes.⁴⁴

Mexican integration into NAFTA has required it to raise its efficiency and environmental standards. In the automobile industry, for example, it patterned its standards on U.S. and Canadian regulations, meaning these three countries now have a harmonized fuel-efficiency standard. Mexico exports 81 percent of its cars to the global market, so this regulation

⁴² CEC, Project Summaries 2011-2012, <http://www3.cec.org/islandora/en/item/10869-project-summaries-2011-2012-en.pdf>

⁴³ North American Regional Action Plans, CEC, <http://www.cec.org/Page.asp?PageID=1323&SiteNodeID=312>

⁴⁴ The Offshore Group, Mexico Manufacturing Information, <http://offshoregroup.com/2012/05/24/mexican-environmental-laws-unenforced-turmoil-or-evolving-success/> (May 24th, 2012)

could make the Mexican car industry more competitive globally.

One of the latest parameters created was a new fuel-efficiency standard for light vehicles, which was the first fuel-efficiency standard put forward in Latin America. The new standard sets the average limit to vehicle fleet at 14.9 kilometers per liter of gas (or 35 miles per gallon) by 2016. This will reduce CO2 emissions and the expenditure in fuel by consumers.

Chinese OFDI coming to Mexico must comply with the rules, standards and international environmental agreements signed by Mexico, especially if the final destination of its goods is the US, and even if these products are to stay in the domestic market they have considerable restrictions.

As to social and labor standards, at least in the manufacturing sector, there is little information that can be obtained for Chinese enterprises in Mexico. However, the fact that the CCPIT survey to more than 1000 Chinese enterprises shows that the greatest threats to them in the European Union and the United States, which are mature democratic developed countries, were labor disputes, is quite interesting. This gives a hint in the sense that as in the case of environmental performance, these firms are led to comply with the host country standards, but if such standards are poor, they probably do not aim at higher ones by their own convictions.

Again, though, one must remember that many of the Chinese enterprises in Mexico, especially the large ones are either joint ventures or are developed countries' enterprises that have been acquired by Chinese ones, so their labor standards would most probably follow those of the original country's owner, or at least would be strongly influenced by them.

Conclusions (tentative)

This paper has looked into the trade between Mexico and China and this country's OFDI in the first nation, with the purpose of analyzing its characteristics, looking at its potentials, and evaluating the environmental and social (especially employment) effects for Mexico. Some of the findings are the following:

- Trade between Mexico and China has intensified during the last ten years, but at the same time Mexico's trade balance with China has worsened considerably (while trade balance with the world is presently in positive numbers). The rapid and wide increase in imports had negative employment consequences, mainly in the textile and garment industry. This was the result of the competition from Chinese imports for Mexican products both in the Mexican and especially in the US markets. Though Mexico has been recovering its US market share (in 2012 its market participation was 12%, the same as it had been in 2000), employment in these sectors has not.
- Not all deficit can be seen as displacement of Mexican production by Chinese imports. Part of this deficit is also a sign of greater integration of Global Value Chains,

where China, Mexico and the United States participate (mostly in the electronics industry and to a limited extent in the automobile industry). Therefore, what is a negative balance with China can be helping a positive balance with the US in specific items.

- But an important part of the surge in imports has harmed the Mexican production sector and has created conflicts between China and Mexico, with an additional negative element, which has been the irregularities that have surrounded the import rise into the Mexican markets, especially in the textile and apparel, the footwear sector and the toy sector, among others, causing a strong response from the Mexican private and public sectors.
- The joint search for ways of overcoming these problems has bettered the atmosphere between these countries. New bilateral agreements and institutionality (bilateral cooperation commissions, high level group, etc) have already improved the diplomatic relationship, which is one of the important issues that may allow exports to expand to that country and stimulate growth and employment in Mexico.
- Regarding the environmental effects of exports to China, the restructuring of these toward primary goods exports may damage the environment. The rise in mining exports are consistent with an important increase in OFDI directed to this sector too.
- Regarding manufacturing exports, GHG emissions generated between 2000/2002 and 2010/2012 expanded, but mostly as a result of the scale effect, while the structure of manufacturing exports (composition effect) has changed in favor of less polluting manufacturing segments and the environmental technical effect also has helped emissions not to grow as much as they would have in the absence of these improvements.
- There are, of course, interactions between trade and OFDI: China's access to WTO and the MIA elimination made it much easier for finished goods to enter Mexico in the textile and apparel market, which discouraged Chinese investments in this area in the second half of the 2000s.
- Chinese OFDI in Mexico has been very scarce, even compared with that in other Latin American countries. However it has been growing at a high rate, but most of it goes to mining, and lately the construction sector, while manufacturing has not attracted much of this OFDI recently (though there are some good signs).
- There is uncertainty as to whether Chinese OFDI will be growing at the same rate it has over the past ten years and hence whether it may be a positive compensating variable for the thinning of OFDI coming from developed to developing countries, among which is Mexico. However, Chinese OFDI flowing to Mexico has been so small that it doesn't seem as difficult for it to grow, especially considering the improvement of bilateral diplomatic relationships.
- OFDI in the Mexican manufacturing sector is diverse. The reasons for this are numerous: OFDI has been inhibited by the government to government tensions derived from trade conflicts between the two countries, the different institutional frameworks in these nations, the scarce chances for Chinese firms to engage in the kind of joint ventures they are mostly interested in, the fact that their technology is somewhat behind the most modern and required to enter the US market; the obstacle posed by cultural and linguistic differences between them, among others, the much more limited resources available to help the private sector (which is the main investor for

manufacturing industry abroad) in China to ðgo globalö, than for the SOEs.

- It seems that though China is capturing a growing share of the high technology manufacturing market worldwide and these exports have expanded at an even higher rate than that of total manufacturing goods (Gallagher and Porzecanski, 2010), China apparently can perform much better in the production of these sort of goods from Mainland China, where they count with strong high tech clusters and infrastructure, with more incentives and a much easier understanding among the producing agents than they do abroad. This is surmounted to some extent when OFDI outside China sets up in a joint venture with developed countries' enterprises that can provide technology, know how, and the marketing channels and tools (this has been the way China has developed its high tech industry at home too).
- There is important evidence that shows that the environmental and social performance of Chinese companies overseas depends to a great extent on the host's country legal and regulatory framework. Therefore, the more developed the country where OFDI goes, the higher the standards applied by them. However, Mexico is a country that has made much progress in the regulations on environmental protection at least partly as a result of the requirements of NAFTA (and OECD). It has developed several forms of pollution emissions measurement, an institutionality to supervise the performance of polluting enterprises, it has developed voluntary schemes to improve companies' environmental behavior, among other instruments. Hence, though Mexico could most probably have a better environmental protection system it has one of the best in Latin America as far as industrial pollution emissions is concerned. Additionally, besides the general norms required to be fulfilled by enterprises, there are specific rules for specific industries, such as textiles, electronics and automobile. These elements lead us to think that especially new Chinese OFDI in Mexico would not be able to have a very polluting behavior.
- The small group of manufacturing Chinese enterprises in Mexico (we have found 38) are very diverse. Most of the large ones are the result of acquisition of European or US enterprises by Chinese ones; or joint ventures between Chinese and developed countries' companies. This group is quite diverse and heterogeneous, but in general, they do not belong to highly polluting sectors and there are a few of them for which we were able to obtain information which have undergone environmentally innovative technology, have had environmental certifications, etc..
- As to social impact of OFDI, we were not able to find abundant information. However, there may be a problem with migration and a demand for bringing from China an important percentage of the labor force required by some of these enterprises. The reasons for it may be varied.

Bibliography

[Alvarez Medina, Lourdes \(2007\), La industria Automotriz china: Posibilidades de competir con la industria automotriz en México.](#) in Dussel Peters, Enrique and Yolanda Trápaga (2007), *China y México: Implicaciones de una nueva relación*, Nuestro Tiempo, Mexico.

Anguiano, Eugenio y María Teresa Rodríguez (2011), 'El sistema financiero de China: heterodoxia política', *Cuadernos de Trabajo del CECHIMEX*, N° 4, UNAM, México
<http://www.economia.unam.mx/deschimex/cechimex/chmxExtras/documentos/cuadernos/2011/Cuadernos%20del%20Cechimex%202011-4.pdf>

Berger, Axel (2013), 'Investment Rules in Chinese Preferential Trade and Investment Agreements; Is China following the global trend towards comprehensive agreements?', *Discussion Paper*, German Development Institute, Bonn, July. [http://www.die-gdi.de/CMS-Homepage/openwebcms3.nsf/\(ynDK_contentByKey\)/ANES-96KDZQ/\\$FILE/DP%207.2013.pdf](http://www.die-gdi.de/CMS-Homepage/openwebcms3.nsf/(ynDK_contentByKey)/ANES-96KDZQ/$FILE/DP%207.2013.pdf)

CEC, NAFTA, Greening the Economy in North America *Improving the Economic and Environmental Performance of the North American Automotive Industry Supply Chain*, (2011)

CEC, NAFTA, Greening the Economy in North America, Sound Management of Electronic Wastes in North America (2011)
http://www.cec.org/Page.asp?PageID=122&ContentID=25428&SiteNodeID=1230&BL_ExpandID

China Council for the Promotion Of International Trade (2013), *2013 China Outbound Foreign Direct Investment Survey*.

Duhamel, François and Diana Bank (2013), 'México como plataforma para las inversiones directas chinas?', in E. Dussel Peters (Coordinator), *América Latina y El Caribe ó China; Economía, Comercio e Inversiones*, ALC-China and Cechimex, Udual, UNAM, Mexico.

Duran Lima, José and Andrea Pellandra (2013), 'El efecto de la emergencia de China sobre la producción y el comercio en América Latina y el Caribe' in E. Dussel Peters (Coordinator), *América Latina y El Caribe ó China; Economía, Comercio e Inversiones*, ALC-China and Cechimex, Udual, UNAM, Mexico.

Dussel Peters, Enrique (coord.) (2013), *América Latina y El Caribe ó China; Economía, Comercio e Inversiones*; Red ALC-China; Cechimex, UNAM,
<http://www.dusselpeters.com/63.pdf>

Dussel Peters, Enrique (2007), *Oportunidades en la relación económica y comercial entre China y México*, CEPAL, ONU.
<http://www.economia.unam.mx/deschimex/cechimex/chmxExtras/repositorio/archivos/OportunidadesChina-Mexico2007.pdf>

Dussel Peters, Enrique (2007), *Inversión Extranjera Directa en México: Desempeño y Potencial. Una Perspectiva Macro, Meso, Micro y Territorial*
<http://www.economia.unam.mx/deschimex/cechimex/chmxExtras/repositorio/archivos/OportunidadesChina-Mexico2007.pdf>

Dussel Peters, Enrique y Yolanda Trápaga (2007), *China y México: Implicaciones de una nueva relación*, Nuestro Tiempo, México
<http://www.economia.unam.mx/deschimex/cechimex/chmxExtras/repositorio/archivos/CHINA%20Y%20MEXICO%20Implicaciones%20de%20una%20nueva%20relacion.pdf>

Dussel Peters, Enrique (2013), "Características de la inversión extranjera directa china en América Latina (2000-2011)", in E. Dussel Peters (Coordinator), *América Latina y El Caribe ó China; Economía, Comercio e Inversiones Economía, Comercio e Inversiones*, ALC-China and Cechimex, Uduval, UNAM, Mexico.

Dussel Peters, Enrique (2012a), "The Auto Parts-Automotive Chain in Mexico and China: Co-operation Potential?" *The China Quarterly* 209, March.

Dussel Peters, Enrique (2012b), "Chinese FDI in Latin America: Does Ownership Matter?" *Discussion Paper* N° 33, Working Group on Development and Environment in the Americas, November.

Dussel Peters, Enrique (2009), "El Caso de México", in Rhys Jenkins and E. Dussel Peters (editors), *China and Latin America; Economic relations in the twenty-first century*; German Development Institute Studies (D.I.E) and Cechimex, Bonn and Mexico City.
<http://www.economia.unam.mx/deschimex/cechimex/chmxExtras/repositorio/archivos/DIE.pdf>

Dussel Peters, Enrique and Kevin P. Gallagher (2013), "NAFTA's uninvited guest: China and the disintegration of North American trade", *CEPAL Review*, N° 110 LC/G.2572-P/, Santiago, Chile, August.

ECLAC (2013), "Chinese foreign direct investment in Latin America and the Caribbean: China-Latin America cross-council taskforce", *Working Document*, LC/L.3729, ECLAC, Santiago, Chile.

ECLAC (2010), *Foreign Direct Investment in Latin America and the Caribbean, 2010*
http://www.cepal.org/publicaciones/xml/0/43290/Chapter_III._Direct_investment_by_China_in_Latin_America_and_the_Caribbean.pdf

Fernandez, Alex E. and Barbara Hogenboom, (2012), *Latin America Facing China; South-South Relations beyond the Washington Consensus*, Berghahn Eds and CEDLA

Gallagher, Kevin and Roberto Porzecanski (2010), *The Dragon in the Room; China and the Future of Latin American Industrialization*, Stanford University Press, Stanford, California.

Gallagher, Kevin, Amos Irwin and Katherine Koleski (2012), "The New Banks in Town: Chinese Finance in Latin America",
<http://ase.tufts.edu/gdae/Pubs/rp/GallagherChineseFinanceLatinAmericaBrief.pdf>

Jáuregui Nolen, Elena Catalina, José de Jesús Salazar Cantú, Raymundo Cruz Rodríguez Guajardo, Héctor González García (2010), Free Trade and Pollution in the Manufacturing Industry in Mexico: A Verification of the Inverse Kuznets Curve at a State Level, *Ensayos Revista de Economía* Volumen XXIX, No. 2, noviembre 2010, pp. 99-119.

Jenkins, O. Rys and Alfonso Mercado (2008), *Tendencias, Regulación y Comportamiento Empresarial*, El Colegio de México.

Lin, Jianhua, (2007), El Caso de Sinatex SA de CV en México, "Oportunidades en la relación económica y comercial entre China y México"; in Coord. E Dussel, *Oportunidades en la relación económica y comercial entre China y México*, pp . 239-244.

Kevin P. Gallagher, Amos Irwin, Katherine Koleski (2012), *The New Banks in Town: Chinese Finance in Latin America*, The Interamerican Dialogue, February, pp. 83-108.

Kosteas, Vasilios D.

Trade protection and capital imports in the Mexican manufacturing sector. *World Development*, vol. 36, n. 12, December 2008, p. 2822-2837.

Lin, Yue (2013), "Inversión extranjera directa de China en América Latina", in E. Dussel Peters (Coordinator), *América Latina y El Caribe ó China; Economía, Comercio e Inversiones*, ALC-China and Cechimex, Udual, UNAM, Mexico.

OECD (2007), *Environmental Performance Reviews; China*; OECD, France.

Oswaldo Rosales y Mikio Kuwayama (2012), *China and Latin America and the Caribbean Building a strategic economic and trade relationship*, Libros de la CEPAL, CEPAL, Stgo.

Rivera, Alexis (2013), "Desarrollo de infraestructura de transporte en México a partir de la inversión china", en E. Dussel (coord.) *América Latina y El Caribe ó China; Economía, Comercio e Inversiones*; Red ALC-China; Cechimex, UNAM,
<http://www.dusselpeters.com/63.pdf>

Sirkin, Harold L., Justin Rose and Michael Zinser (2012), *The US Manufacturing Renaissance; How shifting global economics are creating an American Comeback*, Knowledge@Wharton.

Red Mercosur, *Amenaza y oportunidad: China y América Latina*
<http://www.redmercosur.org/amenaza-y-oportunidad-china-y-america-latina/publicacion/238/es/>

Robbie M. Andrew and Glen P. Peters (2013), A Multi-Region Input-Output Table Based

On The Global Trade Analysis Project Database (Gtap-Mrio), Economic Systems Research, 25:1, 99-121, DOI: 10.1080/09535314.2012.761953, Routledge
<http://dx.doi.org/10.1080/09535314.2012.761953>

Schatan, Claudia (2013), "El sector de tecnologías de la información y la comunicación y las políticas industriales: Un tema actual para México", *Serie de Documentos de Trabajo 2013*, N° 4, Universidad Iberoamericana, Mexico, November.
http://www.iberoeconomia.mx/images/stories/Publicaciones/DocumentosTrabajo/Working_Paper_4_2013_TecnologiaInformacionyPoliticaIndustrial_Schatan_Noviembre2013VF.pdf

Schatan, Claudia and Liliana Castilleja (2005), "La Industria Maquiladora Electrónica en México", in J. Carrillo and C. Schatan (Editors), *El Medio Ambiente y la Maquila en México: un problema ineludible*, ECLAC Books N° 83.

Studer, Isabel (2006), *El TLCAN y la industria automotriz en México: hacia la armonización de los estándares ambientales en América del Norte*, Commission for Environmental Cooperation, NAFTA, <http://www3.cec.org/islandora/en/item/2257-nafta-and-mexican-automobile-industry-es.pdf>

UNCTAD (2013), *World Investment Report 2013; Global Value Chains: Investment and Trade for Development*, United Nations, Geneva
http://unctad.org/en/PublicationsLibrary/wir2013_en.pdf

Watkins, Ralph (2013), "Meeting the China Challenge to Manufacturing in Mexico" in Eds. E. Dussel Peters, A.H. Hearn and H. Shaiken, *China and the New Triangular Relationships in the Americas; China and the Future of U.S.-Mexico Relationship*, Center for L.A. Studies, University of Miami, Center for Latin American Studies and Cechimex.
<http://www.dusselpeters.com/62.pdf>

Watkins, Ralph (2007), "El Reto de China a las Manufacturas de México", in Dussel Peters, Enrique (2007), *Oportunidades en la relación económica y comercial entre China y México*, CEPAL, ONU.
<http://www.economia.unam.mx/deschimex/cechimex/chmxExtras/repositorio/archivos/OportunidadesChina-Mexico2007.pdf>

World Resource Institute (2013), *Environmental and Social Policies in Overseas Investments: Progress and Challenges for China*, Denise Leung and Yingzhen Zhao, in Collaboration With Tao Hu and Athena Ballesteros, abril.
http://pdf.wri.org/environmental_and_social_policies_in_overseas_investments_china.pdf

Zhou, Yu

Synchronizing export orientation with import substitution: creating competitive indigenous high-tech companies in China.

World Development, vol. 36, n. 11, November 2008, p. 2353-2370; incl. ref. 2008

Newspaper Articles:

Un invitado incómodo en la fiesta del TLCAN: El camino de las fábricas chinas a EEUU pasa primero por México; Knowledge Wharton, 20/03/2013
<http://www.wharton.universia.net/index.cfm?fa=viewArticle&ID=2324>

México demanda a China ante OMC por textiles; El Economista, 15/10/2012
<http://eleconomista.com.mx/industrias/2012/10/15/mexico-pide-china-explicacion-posibles-danos-textileras>

Acusan a Textiles KN de Oriente de enfermar de gravedad a 45 personas, KARINA AVILES, 18/03/2006
<http://www.jornada.unam.mx/2006/03/18/index.php?section=politica&article=014n4pol>

Greenpeace, *Hilos Tóxicos: Al desnudo; Exponiendo el papel de la industria textil en la contaminación de los ríos de México*, Reportes - 5 diciembre, 2012
<http://www.greenpeace.org/mexico/es/Footer/Descargas/reports/Toxicos/Hilos-Toxicos-Al-desnudo/>

Inversión china en automotriz incipiente en México,
<http://www.manufactura.mx/industria/2013/06/07/inversion-china-en-automotriz-incipiente-en-mexico>

GM, Ford, VW Dominate China's Auto Industry: Why Can't Chinese Companies Like SAIC, Dongfeng, Geely, And GAC Make Cars That People Want To Buy?
<http://www.ibtimes.com/gm-ford-vw-dominate-chinas-auto-industry-why-cant-chinese-companies-saic-dongfeng-geely-gac-make>

China is 10 years from fielding global, competitive automakers, report says
<http://europe.autonews.com/article/20130223/ANE/302239973/china-is-10-years-from-fielding-global-competitive-automakers-report#axzz2blmK2qSq>

Citing Environmental Concerns, China Pushes Back On BMW Expansion; Is This A Routine Gesture Or The New Norm?
<http://www.ibtimes.com/citing-environmental-concerns-china-pushes-back-bmw-expansion-routine-gesture-or-new-norm-1366403>

Chinese automakers to expand overseas presence,
http://www.chinadaily.com.cn/china/2013-04/24/content_16446708.htm

NAFTA's Uninvited Guest: Why China's Path to U.S. manufacturing Runs Through Mexico (art periódico)
<http://www.wharton.universia.net/index.cfm?fa=viewArticle&id=2324&language=english>

Hitting the Accelerator: China's Automakers Race to Latin America
<http://www.wharton.universia.net/index.cfm?fa=viewArticle&id=2157&language=english>

Is China Stepping up Trade with Latin America Too Quickly?

<http://www.wharton.universia.net/index.cfm?fa=viewArticle&id=2025&language=english>

Mexico's Pemex to increase oil exports to China

<http://www.reuters.com/article/2013/04/06/mexico-china-oil-idUSL2N0CT0CH20130406>

Reuters

Report: Chinese investment into Mexico booming <http://www.nzte.govt.nz/explore-export-markets/Export-Intelligence/Pages/Report-Chinese-investment-into-Mexico-booming.aspx>

China will invest \$2 billion to back Interamerican Development Bank (IADB) public and private sector projects in Latin America and the Caribbean, the development bank said on Saturday. Reuters 16_03_13.

Mexico and China Announce \$560 Million in New Investment Deals. Reuters Last update 01 May, 2012

Mexico Seeking Investment by Chinese Automakers

L-A Herald Tribune, March 18, 2013

<http://www.laht.com/article.asp?CategoryId=14091&ArticleId=332686>

Se incrementan las inversiones chinas en México (El Financiero 08/03/12)

How Are China's Overseas Investments Affecting the Environment? ó WRIInsights; May 9, 2013

See more at: <http://insights.wri.org/news/2013/05/how-are-chinas-overseas-investments-affecting-environment#sthash.xNKHqdnb.dpuf>