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Mexican Manufacturing and its Integration into Global Value Chains

Juan Carlos Castillo and Adam Szirmai*

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Abstract

This paper studies the value added contributions to final manufacturing output produced in Mexico. It distinguishes between contributions originating from foreign producers located in different major regions of the world economy and contributions made by domestic producers. The analysis is performed for the main two components of Mexican manufacturing: assembly plants producing for export markets (Maquiladora industry) and manufacturing firms mainly producing for the domestic market (Domestic Manufacturing). To this end, Mexico (Maquiladora) and Mexico (Domestic Manufacturing) are separately included into World Input-output Tables (WIOT) from 1998 to 2011. The empirical analysis shows that the structure of value added contributions with regard to the final output of the Mexican domestic sector has remained unaltered, while the structure of value added contributions to the final output of the Maquiladora sector has drastically changed over time.

For its own final output, Mexico (Domestic) has the largest share of value added contributions with some increase in the value added contributions of producers in foreign countries (notably, the USA). With regard to the final output of Mexico (Maquiladora) there was a shift from a dominance of US value added in all the manufacturing sectors (70% in 1998) to a much more diversified structure of value added contributions. By 2011, the East Asian share in value added was the largest in the Electrical and Optical equipment sector. Mexico (Domestic Manufacturing) and Mexico (Maquiladora) had the largest value added contributions in the Transport Equipment sector, while the US continued to account for the lion's share of value added in the textile industry.

In our view, those changes in the structure of value added contributions have to do with decisions by US firms to reallocate production to low-cost countries in Asia. They reflect changing patterns of the integration of Mexico in global value chains.

JEL Codes: C67, L6. F2
Keywords: Global Value Chains, Export processing, World Input-output Tables, Manufacturing, Mexico

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1 Introduction

In the last two decades, Mexico's manufacturing production has increased substantially. According to De La Cruz et al. (2011), Mexico's international trade (exports plus imports of goods) grew from $82.3 billion in 1990 to $553.8 billion in 2007, representing 56% of the GDP during that same year. Moreover, this remarkable performance is further confirmed by the current position of Mexican manufacturing. According to the Mexican Ministry of Economic Affairs, by 2014 Mexico was producing more manufacturing goods than all other Latin American countries put together; it is the World's largest provider of flat screen televisions and the largest recipient of FDI in the Aerospace sector.

Assessing the domestic and foreign value added content of Mexican manufacturing production has been a major concern of scholars. However, they have reached very different conclusions depending on the different components of Mexican industry that they studied. For instance, when considering the production from the whole universe of manufacturing firms in Mexico, the conclusion has been that domestic value added content is substantially higher than the foreign one. According to the Trade in Value Added initiative (OECD/WTO, 2013) Mexico's domestic value added content of its exports in 2009 was 70% and had remained relatively stable since 1995. A similar conclusion is reached when the manufacturing firms that produce both for the domestic and for the foreign market (i.e. the Domestic economy of Mexico) are analysed. According to the estimates of De La Cruz et al. (2011) and Koopman et al. (2014), the domestic share of value added content in the exports of Mexico-Domestic is more than 70% in 2004. On the other hand, when analysing the firms that solely produce for the foreign market (Maquiladora industry) very different conclusions are reached. In this case, it is found that the firms in the Maquiladora sector have been unable to steadily increase the domestic value added content of their exports (less than 25% of total value added content) (De La Cruz et al., 2011; Koopman et al.,2014; Castillo and De Vries, 2014).

This research studies the value added trends observed in the final output produced by Maquiladora and by the Domestic economy of Mexico in a single unified framework. It is the Global Value Chain perspective that provides such a unified framework. This means that we will quantify the value added contributions from domestic and foreign producers (by country of origin) that participate in the production for exports (Maquiladora), as well as the value added contribution in the production that supplies both domestic and foreign markets (Domestic Economy of Mexico). We examine two main research questions:

(1) Which regions and countries capture most of the value added embodied in Mexico's final output as a result of the increasing globalisation of production?;

(2) To what extent does Mexico itself benefit from such final output?.

With regard to the first research question, our aim is to understand to what extent foreign producers in major regions (US/Canada, East Asia and Europe) interact with each component from the Mexican manufacturing production (Domestic Economy and Maquiladora), as well as the extent to which such regional interaction within each manufacturing component drives the foreign value added content for the total manufacturing production in Mexico. With regard to the second research question we want to analyse how local producers in the Maquiladora and in the Domestic Economy of Mexico interact in order to produce their own manufacturing goods and the extent to which their own value added content drives the results for the total domestic value added content in the total manufacturing production of Mexico.

In order to meet those objectives, we have constructed a novel data set where the Maquiladora and the Domestic Economy of Mexico are included into the World Input-output Tables (WIOT) from 1998 to 2011. With help of such tables, and by implementing a new measure of fragmentation that is extended to a multi-country setting (Los et al., 2014), our research will show that each component of Mexican manufacturing production has had a different pattern of integration into Global Value Chains.

On the one hand, the value chains of manufacturing production in the Domestic Economy of Mexico are still predominantly local and regional. Such production only experienced minor changes in terms of the local/ regional value added content embodied on its final output. Between 1998 and 2011, local producers in the Domestic economy of Mexico accounted for the largest value added share (74% of the value added content of total final output in 2011), while there were only minor increases in the share of firms from US/Canada and East Asia in the value added content of final output (16% and 3% respectively by 2011). This pattern where local producers in the Domestic Economy of Mexico have the largest share in the value added content embodied on its own final manufacturing output was observed in every single manufacturing sector with very few changes over time.

On the other hand, value chains in the Maquiladora sector are both regional and global. Over time, Maquiladora presents major changes on its country/ regional value added content. The US/Canada share in value added content embodied in the total maquiladora final output dramatically decreased from 68% in 1998 to 29% in 2011. During the same period, the corresponding East Asian and Mexican value added in final maquiladora output increased from 6% to 23% and from 20% to 33%, respectively. This trend, however, shows substantial variation across key maquiladora manufacturing sectors. While US/Canada had the largest share of value added content in every single manufacturing sector in 1998, by 2011 East Asia had the largest share in Electronic Equipment (40%), and local Mexican producers had the largest share in Transport Equipment (49%) and US/Canada in Textiles and Textile products (39%).

Thus, on the basis of the empirical evidence, our research reaches four major conclusions.

First of all, we identify a decline in the dependence of Maquiladora production on US inputs. This decline is counterbalanced by an increasing use of East Asian inputs (mostly sourced from China).

Second, we provide new empirical evidence for the debate between regionalisation and globalisation of the sourcing of inputs for manufacturing production.[1] Much current research argues that global value chains in manufacturing is still primarily operate at the local and regional level despite dramatic decreases in transport and communication costs. Our research, on the other hand, indicates that countries with maquiladora-like production (export processing zones) can experience both regionalisation and globalisation of manufacturing production[2]. The relative importance of localisation, regionalisation or globalisation of manufacturing will depend on certain conditions related to the type of final good being produced (its modularity), trade and policy incentives, the competitive advantages offered by the country and so forth.

The third finding is the complex scenario that policy makers face nowadays, if they wish to increase the use of domestic inputs in the context of global value chains. Our results for the automotive industry in maquiladora production indicate that incentives provided under industrial policies and trade agreements (such as NAFTA) are not sufficient to increase the use of domestic inputs. Maquiladora production in this particular manufacturing sector further required bilateral industrial cooperation between the governments of Mexico and the United

[1] Regionalisation refers to the sourcing of inputs from Mexico's NAFTA neighbours Canada and the USA. Globalisation refers to the sourcing of inputs from Asia. Local value chains refer to the sourcing of inputs within the domestic economy of Mexico.

[2] Globalisation of manufacturing production should be understood as the increasing participation of countries outside the region in the final output produced by a given country.

States. This bilateral cooperation, effectively combined with Mexican tax incentives and NAFTA benefits, seems to have been the key factor behind the increasing domestic value added content in the transport sector.

The last finding from our research is the relative contribution of domestic inputs in creating value added in the domestic sector and in the Maquiladora. Our research indicates that over time the domestic sector has had much stronger domestic linkages than Maquiladora. Moreover, we show that the aggregate trends in domestic value added content for the whole universe of producers in Mexico is largely driven by the producers in the Domestic economy of Mexico. Therefore, the role of maquiladora production in inducing a higher use of domestic inputs remains limited.

This paper is structured as follows. Section 1 describes the main characteristics in the production of Maquiladora and in the Domestic Economy of Mexico, as well as some considerations about the key features of manufacturing production in Mexico. Moreover, this section describes the new concept of "Manufactura Global". This concept, introduced by the Mexican statistical office, represents the new official statistical tool to study maquiladora production within the national accounting system from Mexico. Section 2 describes our methods. Section 3 presents our data construction strategy to divide Mexico (as presented by WIOD) into Mexico (Maquiladora/Manufactura Global) and Mexico (Domestic Economy) from 1998 to 2011. Section 4 presents our data requirements. Section 5 introduces relevant descriptive statistics. Section 6 presents our main empirical results. Finally, section 7 provides conclusions and some ideas about the future of manufacturing in Mexico.

2 An overview of Mexican manufacturing

The firms in the Mexican manufacturing industry can be classified into two categories. On the one hand, there are the manufacturing firms that export their entire production to foreign markets. These include all the firms within the IMMEX programme (Maquiladora and PITEX firms). On the other hand, we have the manufacturing firms that produce for both domestic and foreign markets (domestic manufacturing of Mexico). In the forthcoming paragraphs, we discuss each of these categories in more detail.

2.1 Export promoting Programmes and the Production for Global Production Networks.

The Maquila industry, officially known as "Industria Maquiladora de Exportación", mainly consists of foreign firms located in the North of Mexico close to the border with the United States. The Maquiladora export promoting programme allows for the temporary imports of intermediate imports (and of capital goods) for the production of manufacturing goods in Mexico. Provided that such production is exported, Maquiladora firms receive significant tariff incentives. Those tariff incentives include exemptions from general import taxes, value added taxes and countervailing duties, when applicable. Most of the intermediate inputs used by the Maquila industry come from the United States (though progressively more from East Asia), and its entire final output is exported, mainly to the United States.

According to official statistics, Maquiladora firms do not produce any intermediate goods. The domestic intermediate goods used by the Maquiladora are completely sourced by local manufacturing producers in the rest of the economy (i.e. local producers in the Domestic Economy of Mexico). Historically, the Mexican government has made some attempts to promote increasing domestic sourcing of intermediate inputs from

local producers by Maquiladora firms. These attempts include programmes for the development of domestic suppliers, support for research and development activities (Durán, 2005) and, more recently, the establishment of meetings between maquiladora producers and domestic suppliers in order to negotiate input sales. Nevertheless, the Maquiladora industry has not increased its domestic intermediate consumption over time. For instance, Castillo and De Vries (2015) have documented a long-run decline in the domestic value added content of maquiladora exports[3] (from 27% in 1981 to 13% in 2006), which appears mainly related to external and internal shocks to the Mexican economy (signing of NAFTA , industrial emergence of China) rather than changes in the regulatory environment.

The maquiladora firms do not have much incentive to increase domestic sourcing of intermediate inputs. The reasons for this, however, are not limited to the tariff exemptions provided on the imports of intermediate goods. Other reasons include the high standards imposed by Maquiladora firms on domestic producers. For example, domestic producers have to meet very strict and time-consuming processes of certification and quality control before they can supply inputs to multi-national firms in the Macquiladora sector. In addition, the quality and technology of inputs demanded by maquiladoras is typically quite high and often subject to change.

Given the success of the Maquiladora programme in increasing the size and export orientation of Mexican manufacturing[4], the Mexican government has implemented similar other export promoting programmes. In 1990, the "Programas de Importación Temporal para Producir Articulos de Exportación" (PITEX) came into effect with the intention of permitting firms to import intermediate inputs and machinery free of duty as long as 30% of their total sales were exported. The difference between the PITEX and the maquiladora programme lies in the fact that under the latter programme firms were exempted from taxes to an even higher degree. Similarly, unlike maquiladoras, PITEX firms were mainly located in the interior of Mexico, as most of their production was destined for domestic consumption (De la Cruz et al., 2011).

In 2007, the "Manufacturing, Maquila and Export Service Industry" (IMMEX) programme was implemented. This programme combined Maquiladora and PITEX firms into a single export promoting programme. The main idea behind the IMMEX programme was to integrate in a single framework all the manufacturing firms in Mexico that together represent 85% of the country's final manufacturing exports[5]. Likewise, this programme aimed at simplifying tariff procedures for Maquila and PITEX firms that were to be exempted from the payment of general import tax, value added tax and, where appropriate, countervailing duties.

Acknowledging the increasing opportunities for participation of manufacturing firms in global value chains, in 2014 the Mexican Statistical Office (INEGI) released a new statistical tool named "Manufactura Global". The

[3] In this case, Castillo and De Vries (2014) measure the domestic value added of content of exports by considering the direct and indirect domestic input content embodied in maquila output.

[4] The Maquiladora Program was initially set up during the 1960s as an emergency program to cope with rising unemployment in North Mexico. It only started to boom during the late 1980s with the increasing outward orientation of the Mexican economy.

[5] In order to receive benefits from the IMMEX program, manufacturing firms are required to report annual sales of more than US$500,000 dollars. Therefore, the remaining 15% of Mexico's total manufacturing exports might include export processing firms that do not meet this sales criterion and that solely benefit from other incentives (trade benefits under NAFTA, competitive advantages from Mexico, etc.). This 15% can also include export production from firms in the domestic economy that produce both for foreign and domestic market.

main objective behind the concept of Manufactura Global was to more thoroughly measure the participation of Mexican manufacturing firms in global production networks. To that end, INEGI identifies from the whole universe of manufacturing firms located in Mexico those that were highly engaged in Global Production Networks. Conceptually, those Mexican firms highly engaged in global production networks are the ones that meet one of the following three criteria: (1) their production should be for exports and most of their intermediate goods should be imported (a ratio of at least 2/3 of their imported intermediate goods with respect to their exports); (2) they should be mostly foreign owned or, (3) produce intermediate goods that are exported for the production of other Global Production Networks not located in Mexico. If a manufacturing firm meets one these criteria, it is classified then as Manufactura Global. As can be seen, this concept takes into account both firms that import a significant amount of intermediate inputs, to re-export them back as final goods as well as firms that export domestically produced intermediate goods for other manufacturing firms not located in Mexico.

By definition, firms under the concept of Manufactura Global include IMMEX firms (Maquiladora and PITEX), as well as manufacturing firms not belonging to IMMEX but located in the Domestic Economy of Mexico and that meet the aforementioned criteria of being highly engaged in Global Production Networks. According to the first estimates provided by INEGI (2014), the gross production from Manufactura Global represented 25.8% of the total manufacturing production in Mexico by 2012. This means that ¼ of the total production in Mexico participates in Global Production Networks by either assembling/transforming domestic and foreign intermediate inputs and/or exporting final and intermediate goods.

2.2 The Domestic Economy of Mexico

As can be seen, the rest of manufacturing firms in Mexico that do not belong to the IMMEX programme or that are not highly engaged in Global Production Networks can be regarded as firms under the domestic economy of Mexico. The manufacturing firms under the Domestic economy of Mexico produce both for the foreign and the domestic market but most of their production is oriented to the Mexican market. According to the latest estimates, by 2012 the Domestic Economy of Mexico accounted for 74% of the total manufacturing production in Mexico and for 29% of the total manufacturing exports. In the same year, producers in the domestic economy accounted for 90% of total domestic intermediate goods in Mexico and 45% of the total supply of imported intermediate inputs (INEGI, 2014)

Data for the manufacturing firms under the Domestic Economy can be found in the monthly industrial survey (Encuesta Industrial Mensual) from INEGI and, as of 2014, they can be also found under the concept of “Rest of Manufacturing Production” in Mexico or “Manufactura No Global” (INEGI, 2014).

2.3 Competitive advantages of manufacturing production in Mexico.

Manufacturing production in Mexico enjoys some significant advantages compared to other major emerging economies. Manufacturing producers in Mexico have benefited substantially from the proximity to the United States as well as from the tariff exemptions under NAFTA and/or the IMMEX programme[6]. Nevertheless, some new features of the Mexican economy are expected to further boost manufacturing production. On the one

[6] In this case, we are referring to both exemptions on US tariffs for exports to the US (provided under NAFTA) and, exemptions from Mexican tariffs on imported intermediate inputs (provided under IMMEX)

hand, Mexico provides new opportunities for manufacturing producers given China's recently soaring wages. According to the Economist (2014), Mexican wages have grown less than 50% in dollar terms over a decade, leaving them 13% cheaper (adjusted for productivity) than China's. On the other hand, there is Mexico's new energy reform. The country's opening up to foreign investors in the oil industry, along with the discovery of new gas resources, is expected to boost production in the petro-chemical sector and, more importantly, to provide cheaper domestic energy. In this context, lower energy and labour costs will be the new advantages offered by Mexico that are complemented with its huge domestic market (120 million people by 2013) and its 44 free trade agreements.

Similarly, Mexico has a competitive advantage in four areas that allow the country to compete effectively with low-cost producers in East Asia. According to Watkins (2007), Mexico has competitive advantages in the following four lines of production; (1) manufacturing production with a high weight to value ratio (the production of cars, flat screens and appliances of large size); (2) production of firms that implement just-in-time procedures and whose production is subject to frequent changes in design (auto parts); (3) goods that require strong managerial involvement in order to meet high quality standards (aerospace industry and medical instruments) and; (4) manufacturing goods where the protection of property rights is important.

Products with a high weight to value ratio are those bulky manufacturing goods for which shipping represents a sizeable share of the cost structure. They include vehicles, non-collapsible furniture, electrical machinery, and appliances of large size. The lower costs of shipping these products from Mexico to the United States implies a benefit for firms that is sufficient to compensate for the large labour cost advantages offered by East Asian countries. Let us consider the case of a refrigerator proposed by The Boston Consulting Group (2008). According to their calculations, the typical U.S. retail price of this product is around $500 dollars. If it were manufactured in a low-cost East Asian country and sold in the United States the cost of shipping would represent $100 dollars (20% of the price tag), while producing it and shipping from Mexico would cost around $49 dollars (10% of the price tag). In this context, difference in freight costs is a major source of competitive advantage for Mexico[7].

Manufacturing firms that need minimise response times, tend to favour Mexico as a production site when they seek to produce for the North American market. Firms located in Mexico are able to offer just-in-time shipping to their counterparts in the US, with a distance short enough to make production in East Asia impractical. Door-to-door time for products sourced from China's east coast and continuing into the interior of the United States average three to four weeks via the West Coast of the United States and four to six weeks via the East Coast. In contrast, door-to-door time is less than a week for products sourced from Mexico (Boston Consulting Group, 2008). This advantage in delivery is critical for manufacturing products for which demand is volatile or for perishable, bulky and seasonal products for which carrying costs are high[8].

[7] In order to further understand the magnitude of the differences in shipping costs, the Boston Consulting Group (2008) also compares freight costs for shipping containers to Pittsburgh, from Mexico, Brazil and China. From Mexico, the shipping cost would be $2,679; from São Paulo, $4,637 and from Shanghai, $5,437.

[8] The shipping times in Mexico have been further reduced. In the past, trucks from Mexico were not permitted to cross the US border, so all shipments were unloaded and reloaded onto U.S. trucks (a process that delayed shipments for about eight hours). Nonetheless, as of September 2007, Mexican carriers have been granted "hosted carrier" status, which allows them free movement within the United States, thus reducing shipping times (Boston Consulting Group, 2008).

Strong managerial involvement is required in the production of those goods that need to meet strict quality requirements. This is the case of the aerospace industry, the production of which also places a high premium on property rights. Both in terms of strong managerial involvement and protection of property rights, Mexico has a significant competitive advantage compared to East Asia. On the one hand, face-to-face meetings are more feasible given that Mexico does not have important time zone differences with major cities in the United States, as well the fact that flights between the two countries only take a few hours. Similarly, managerial involvement is enhanced by the fact that Mexico provides a sizeable pool of US-educated managers with Western ways of thinking and doing business (Boston Consulting Group, 2008). Next, as regards protection of property rights Mexico has advantages over most low country locations. This country has signed an important number of agreements with major advanced and emerging economies on reciprocal promotion and protection of investments (RIPPA)[9]. Such agreements are established by the Mexican Government to provide national and foreign investors with a legal framework that offers stronger protection for foreign investment and Mexican investment abroad.

We can mention some other competitive advantages of manufacturing production in Mexico. The production of components in Mexico's aerospace industry has received significant incentives in the last years. For instance, in 2007 Mexico and the United States signed the Bilateral Aviation Safety Agreement (BASA). This agreement recognises the technical capabilities of Mexico's Directorate of Civil Aeronautics to certify the safety of components made in the country. The recognition provided by this agreement makes re-certification by the US Federal Administration unnecessary. This situation is extremely important for the aeronautic industry in Mexico. The agreement eliminates a step in the supply-chain since products no longer need to be examined internationally before being shipped off to consumers to undergo further assembly operations.

Mexican producers also enjoy the benefits provided by NAFTA. For instance, in the textile industry NAFTA rules are particularly demanding for non-NAFTA producers. This is the case of the NAFTA rules of origin "yarn forward" and "fiber forward". Yarn forward means that the yarn used to produce a fabric must originate in a NAFTA member country. Exemptions from those rules are granted in the cases where the imported textile yarns are not widely produced in North America (the case of silk), provided that the fabric is cut and sewn in one or more NAFTA countries. More demanding rules of origin obtain for textile goods which are widely produced in NAFTA. For example, cotton yarn and cotton knitted fabrics are subject to a fiber forward rule for goods traded between the three countries, while man-made fiber sweaters are subject to a "fiber-forward" rule as to trade between the United States and Mexico.

NAFTA rules of origin in the automotive industry are also an important factor encouraging foreign investors to allocate their production to Mexico, rather than to East Asia. The North American regional value content requirement for autos and light vehicles, their engines and transmissions as well as for other vehicles was initially set at 50%. As of 2002 it was increased to 62%. As for production of televisions, under NAFTA regulations, flat screens assembled in Mexico enjoy duty free access to the US market even if they contain components originating from non-NAFTA countries.

[9] In general, those RIPPAs cover disciplines such as investment definition, scope of application, promotion and admission, investment treatment, expropriation, transfers and resolution of investor-State and State-State controversies.

Finally, it is also worth mentioning some other areas of production where Mexico has less competitive advantages. This is the case with manufacturing goods with light weight and high volume and the ones with a high value-to-weight ratios. The manufacturing goods with light weight and high volume include the textile industry in general as well as "other manufacturing goods" (umbrellas, toothbrushes, toys, bikes collapsible furniture and so forth). The goods with a high value to weight ratio are the ones produced by the electronic industry. Compared to Mexico, Chinese producers in those industries benefit from a well-developed chain of suppliers, abundant labour and a larger domestic market. Furthermore, the fact that the textile industry, other manufacturing goods and the electronic industry are not subject to frequent changes in style allows producers to plan the production well in advance. This characteristic, along with its light output weight, permits shipping the production further lowering transport and total costs. Similarly, many of those goods are mainly sold in North America by huge retailers such as Wal-Mart and its counterpart for the Mexican domestic market Wal-Mexico. Therefore, Mexican producers in those sectors will continuously face difficulties in increasing their market share in the US.

In a nutshell, the next decade will offer many significant advantages to manufacturing producers in Mexico compared to major producers in other emerging economies. Along with the proximity to the United States and tariff incentives under NAFTA and IMMEX rules, producers in Mexico will also benefit from lower labour and energy costs. Nevertheless, success in manufacturing will be greater if production is concentrated in activities where Mexico has the greatest competitive (or comparative) advantages. Manufacturing goods with a high weight to value ratio, whose quality is more important than their prices, that are specially protected under NAFTA rules and whose production is mainly oriented towards foreign markets will continue to be the key drivers of Mexican manufacturing production. These goods include flat screens, appliances of large size (fridges, electric ovens and so forth), medical instruments and automotive products. Following the same reasoning, the manufacturing goods that imply low weight and high volume but whose production is abundant in North America (and that are therefore protected under NAFTA considerations) will also be among the key drivers of Mexican manufacturing production. In this case, we are referring to the manufacture in cotton.

Manufacturing producers will face significant difficulties in increasing their production for exports in the manufacturing sectors where Mexico has less competitive advantages and, where production is less protected under NAFTA regulations. This will be the case for many textile products (clothing, footwear, leather, sportswear, etc.), electronic products (appliances of small size, mobile phones, computers, microwaves, and so forth) and other manufacturing goods.

3 Methodology

In assessing the value added contributions from the different countries and regions involved in the production of Mexico's final manufacturing output, our research will closely follow the approach proposed by Los et al. (2014). By generalising a measure of fragmentation proposed by Feenstra and Hanson (1999), these authors introduce a metric that uses information from World Input-output Tables to describe the international fragmentation of specific global production networks. Specifically, Los et al. (2014) decompose the value of a final product in the last stage (country) where the final manufacturing production took place. This decomposition includes the value added generated in all the countries that contribute to that final product. Therefore, this measure does not only

take into account the value added by the immediate suppliers of intermediates, but also the value added by suppliers further upstream

Formally, consider a particular industry *i* located in a specific country *j*, denoted by (*i,j*). For a good to be produced in an industry (i,j) activities in industries s=1,…,S in each of the countries n=1,…,N are needed. To decompose the total final value of this good into the value added contributions from different industries and countries, the first step to take is to find the levels of gross output associated with the production of (i,j). Those can be estimated by applying standard input-output methods to global input-output tables. Global input-output tables contain information on the values of intermediate input flows among all country industries in the world, as well as on the values of flows from each of these country-industries to final use in each of the countries. These tables also contain information on value added generated in each of the country industries. Combining information on value of sales and value added per dollar of sales leads to estimates of value added in each of the *S*N* industries as a consequence of final demand for product (i,j). For this, we use an equation that has been a standard tool in input-output analysis for over decades (Miller and Blair, 2009);

$$\mathbf{g} = \hat{\mathbf{v}}(\mathbf{I} - \mathbf{A})^{-1}(\mathbf{Fe}) \quad (1)$$

In this equation, $\mathbf{g}$ is the vector of value added created in each of the SN country-industries involved in a value chain. The choice for a specific final output matrix **F** determines which value chain is considered. Final output is output delivered for household consumption and investment demand (both including domestic and final foreign demand). $\mathbf{e}$ is a summation vector. $(\mathbf{I} - \mathbf{A})^{-1}$ is the well-known Leontief inverse, the use of which ensures that value added contributions in all tiers of suppliers are taken into account. **v** is a vector with value added to gross output ratios, for each of the country-industries[10]

The (*SNxSN*)-matrix **A** and the (SN)-vector **v** are obtained as $\mathbf{A} = \mathbf{Z}(\hat{\mathbf{x}})^{-1}$ and $\mathbf{v}' = \mathbf{w}'(\hat{\mathbf{x}})^{-1}$, respectively. **A** gives the intermediate inputs per unit of output of gross output (x), while **v** represents the value added generated per unit of gross output. F stand for a final demand matrix of dimensions SNxCN (where C is the number of final demand categories per country). This implies that Fe is an (SN) vector with a single positive element, which is obtained by adding foreign and final demand for (I,j)'s product.

As can be seen, implementing the aforementioned methodology will allow us to decompose g which contains the value added generated in each of the industries in each of the countries that can be attributed to the global value chains of final manufacturing production in the domestic economy of Mexico (Domestic) and the Mexican Maquiladora sector (Maquiladora/Manufactura Global). Implementing this methodology in our research requires world input-output tables that include separate input-output tables for Mexico (Domestic) and Mexico (Maquiladora/Manufactura Global).

4 Data construction methods: How to include Mexico (Domestic) and Mexico (Maquiladora/Manufactura Global) in WIOT?

A world input-output table (WIOT) is an extension of a national input-output table. A WIOT explicitly indicates the imports by country of origin of goods for intermediate and final use, received by countries. In this paper, the

[10] Matrices are indicated by bold capital symbols and (column) vectors by bold lowercases. Hats denote diagonal matrices with the corresponding vector on the main diagonal.

analysis is based on the World Input-Output Database (WIOD) of the Groningen Growth and Development Centre (GGDC, 2015). A WIOT also indicates the domestic consumption of goods for intermediate and final use and the delivery of those goods domestically produced by county of destination. The novelty of the present paper is that we break down the input-output data for Mexican manufacturing into a Macquila sector and a Domestic sector. Referring to our discussion in section 1, figure 1 indicates the set-up for a world input-output table that divides Mexican Manufacturing into its Domestic economy and Maquiladora/Manufactura Global components. This figure has been divided into three quadrants. Quadrant (A) indicates the industry by industry intermediate use of goods from WIOD countries according to their origin (imported or domestic). Quadrant (B) indicates the final use of goods from WIOD countries according to their origin. Finally, quadrant (C) indicates the total output in each WIOD country.

As can be seen in quadrant (A), Mexico (Domestic) and Mexico (Maquiladora/Manufactura Global) report their industry by industry intermediate use of goods delivered by Country A and the rest of the World respectively (imported intermediate goods). At the same time, Mexico (Domestic) and Mexico (Maquiladora/M. Global) report their industry by industry intermediate use of goods that are both delivered by the Mexico (Domestic) (domestic intermediate goods). Similarly, given that the maquiladora does not deliver any intermediate goods to country (A), Mexico (Domestic), Mexico (Maquiladora/M. Global) and the rest of the world all the squares designed to indicate those deliveries are left in blank (they are equal to zero).

On the other hand, in quadrant (B), Mexico (Domestic) and Mexico (Maquiladora/M. Global) report their final use consumption according to industry and domestic or imported origin. Mexico (Domestic) indicates the final use of goods delivered by Country (A,) by Mexico (Domestic) and by the rest of the World. Following our definition of maquiladora, Mexico (Maquiladora/M. Global) only indicates the final use of capital goods delivered by Country (A) and by the rest of the World. Country (A) in quadrant B reports the final use of goods delivered by Country (A), by Mexico (Domestic), by Mexico (Maquiladora/M. Global) and by the rest of the World. The same description for Country (A) applies for the rest of the world. Finally, quadrant (C) indicates the total output by each industry in each WIOD country.

Figure 1: WIOT Set up with Mexico (Domestic) and Mexico (Maquiladora)

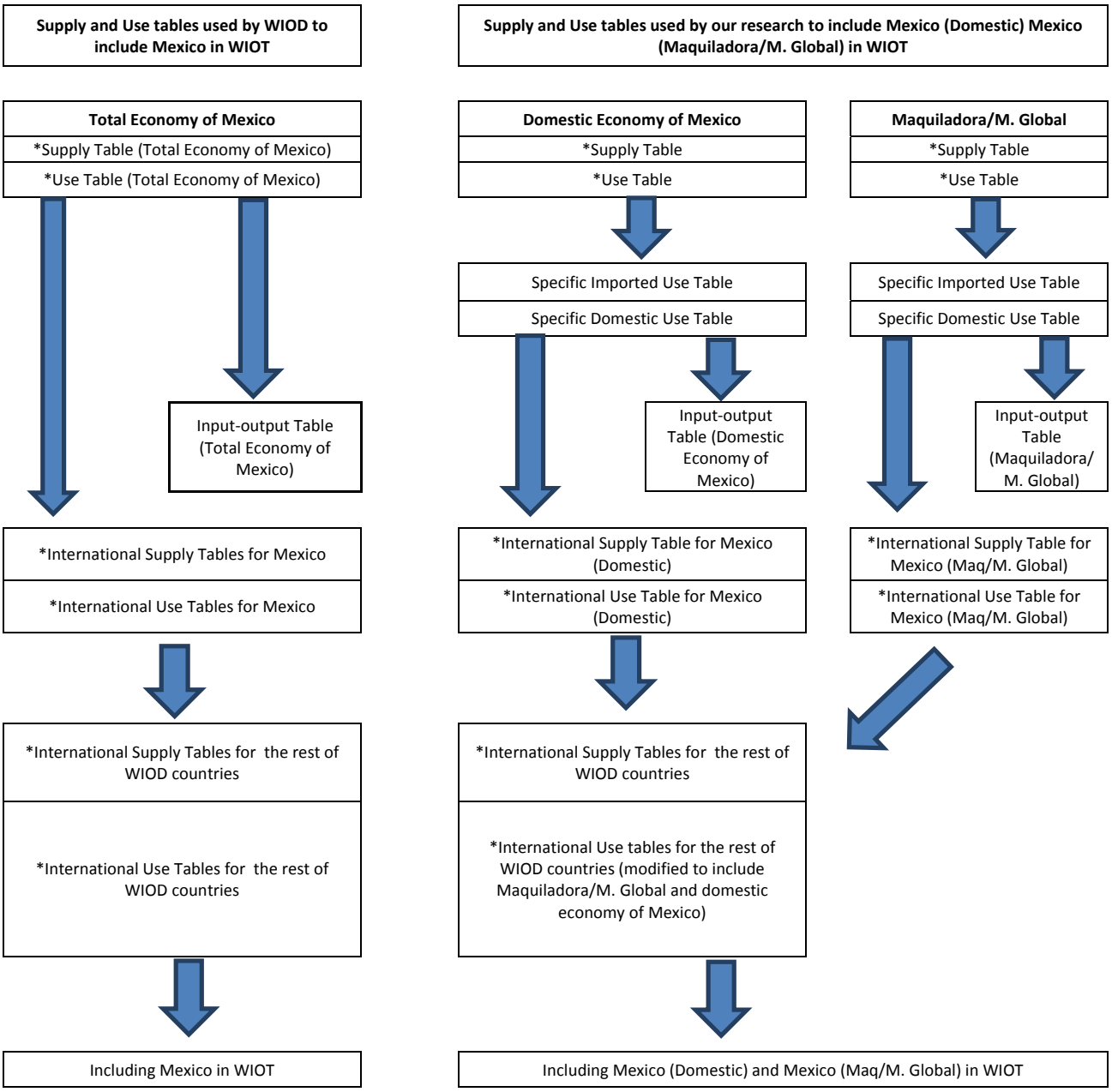
		A				B				C
		Country A Intermediate use Industry	**Mexico (Domestic)** **Intermediate use** **Industry**	**Mexico (Maq/M.Global)** **Intermediate use** **Industry**	Rest of the World Intermediate use Industry	Country A Final domestic Use	**Mexico (Domestic)** **Final domestic Use**	**Mexico (Maq/M.Global)** **Final domestic Use**	Rest of the World Final domestic Use	Total
Country A	Industry	Intermediate use of domestic output	Intermediate use by Mexico (Domestic) of imported inputs delivered by country A	Intermediate use by Mexico (Maq/M.Global) of imported inputs delivered by country A	Intermediate use by RoW of imported inputs delivered by country A	Final use of domestic output	Final use by Mexico (Domestic) of imported final goods delivered by A	Final use by Mexico (Maq/M.Global) of imported final goods (Gross Capital Formation) delivered by A	Final use by RoW of imported final goods delivered by A	Output in A
Mexico (Domestic)	Industry	Intermediate use by A of imported inputs delivered by the Domestic economy of Mexico	Intermediate use by Mexico (Domestic) of intermediate goods delivered by Mexico (Domestic)	Intermediate use by Mexico (Maq/M.Global) of intermediate goods delivered by Mexico (Domestic)	Intermediate use by RoW of imported inputs delivered by country Mexico (Domestic)	Final use by A of imported final goods delivered by Mexico (Domestic)	Final use of domestic output delivered by Mexico (Domestic)		Final use by RoW of imported final goods delivered by Mexico (Domestic)	Output in Mexico (Domestic)
Mexico (Maq/M.Global)	Industry					Final use by A of imported final goods delivered by Mexico (Maq/M.Global)			Final use by RoW of imported final goods delivered by Mexico (Maq/M.Global)	Output in Mexico (Maq/M.Global)
Rest of the World (RoW)	Industry	Intermediate use by A of imported inputs delivered by RoW	Intermediate use by Mexico (Domestic) of imported inputs delivered by RoW	Intermediate use by Mexico (Maq/M.Global) of imported inputs delivered by RoW	Intermediate use of domestic output	Final use by A of imported final goods delivered by RoW	Final use by Mexico (Domestic) of imported final goods delivered by RoW	Final use by Mexico (Maq/M.Global) of imported final goods (Gross Capital Formation) delivered by RoW	Final use of domestic ouput	Output in RoW
		Value Added	Value Added	Value Added	Value Added					
		Output in A	Output in Mexico (Domestic)	Output in Mexico (Maq/M.Global)	Output in RoW					

In order to implement these ideas, several adaptations have to be made to the input tables (supply and use tables) originally used by WIOD that allow us to include Mexico (Domestic) and Mexico (Maquiladora/M. Global) into the structure of the world input-output tables. In order to better understand how our research needs to proceed, the left hand side of Figure 2 presents an overview of the supply and use tables used by WIOD to include Mexico (Total Economy) in the world input-output tables

As can be seen, WIOD first created national (i.e. total economy) supply and use tables which were then used to create national input-output tables. Afterwards, those supply and use tables were linked across countries (by means of bilateral trade data) to create international supply and use tables for Mexico. Finally, the international supply and use tables of Mexico, and that of the rest of WIOD countries, were used to create the world input-output tables. Considering this situation, the right hand side of figure 2 also presents the supply and use tables that are required to include Mexico (Domestic) and Mexico (Maquiladora/M. Global) in WIOT. We require specific supply and use tables (imported and domestic use) for the domestic economy of Mexico and for the maquiladora industry to create input-output tables and international use tables for each of these two concepts.

Furthermore, we need to modify the original set up from all the international use tables from WIOD countries to include Mexico (Maquiladora/ M. Global) and Mexico (Domestic) in their original set up. The appendix A.1 to this research provides a detailed methodological discussion of the steps taken to build the national and international supply and use tables for the two components of the Mexican economy, as well as our final set up of WIOTs with those included.

Figure 2: Supply and Use Tables required for constructing WIOT.



4.1 Data Requirements

As seen in the previous section, including Mexico (Domestic) and Mexico (Maquiladora/Manufactura Global) into the WIOT implies creating supply and use tables - imported and domestic use tables as well as international supply and use tables - for each of the two components of the Mexican economy. Furthermore, it requires including Mexico (Domestic) and Mexico (Maquiladora/Manufactura Global) into the structure of the international use tables from each of the WIOD countries.

In order to meet these objectives, our research requires three type of data; (a) official supply and use tables (domestic and imported use) for Mexico (Domestic) and Mexico (Maquiladora/Manufactura Global) respectively, and; (b) yearly time series from the national accounting system classified according to gross production, gross value added, imported and domestic intermediate consumption, final use and, so forth. (a) and (b) will be the basis for calculating the time series SUTs for each component of the Mexican economy. Finally, the last type of data is (c) bilateral trade data by country of origin (imports) for Mexico (Domestic and Maquiladora/Manufactura Global, respectively) and by country of destination (exports) for Mexico (Maquiladora/Manufactura Global). The latter will be the input data to calculate the international use tables from Mexico (Domestic and Maquiladora/Manufactura Global) and to modify the structure of the international use table from the rest of WIOD countries. In the next lines, we will further describe the main features behind these three types of data.

4.2 Data for SUTs from Mexico (Domestic) and Mexico (Maquiladora/Manufactura Global).

Our research plans to create time series of extrapolated SUTs for the two components of the Mexican economy by means of the well-known SUT-RAS procedure (Junius and Oosterhaven, 2003). The SUT-RAS procedure requires a base matrix which is to be extrapolated with yearly data on industrial output. INEGI (the Mexican Statistical Office) provides specific data for each component of the Mexican economy to carry out this endeavour.

As mentioned already, official SUTs for the total economy of Mexico (2003) were the ones used by WIOD to include Mexico into the WIOT. In order to construct those official SUTs for 2003, INEGI first created specific SUTs for Mexico (Domestic Economy) and for Mexico (Maquiladora). This means that the sum of the SUT for Mexico (Domestic) and the ones for Mexico (Maquiladora) equal the SUT for the total economy of Mexico. Moreover, the available official use tables are further decomposed in specific imported and domestic use tables, per each component of the Mexican economy, respectively.

INEGI also separately reports yearly national accounts data for Mexico (Domestic), Mexico (Maquiladora) and Mexico (Manufactura Global). Such data is similar to the data used by WIOD in order to include Mexico in their dataset. It includes data for gross production, gross value added, imported and domestic intermediate consumption, total imports and exports and for the case of Domestic Economy final demand (note that Maquiladora/Manufactura Global do not consume final goods). All the information for the Domestic Economy of Mexico is readily available on INEGI's website (www.inegi.org.mx). The information for Maquiladora is also available from 1990 to 2006. From 2007 onwards, data for the IMMEX programme is available but it is not

reported in terms of the national accounting system[11]. Nevertheless, in 2014 INEGI released data for the Manufactura Global that is published in terms of the national accounts from 2003 to 2012.

With this background information in mind, we proceed to construct our own dataset as follows. The starting point was to extrapolate the official 2003 domestic (imported) intermediate use table for the Domestic economy of Mexico with yearly data of domestic (imported) intermediate consumption for that same component of the Mexican economy[12]. With this first step, we obtained time series of extrapolated domestic and imported intermediate use tables for Mexico (Domestic) from 1998 to 2011. Those domestic and imported intermediate use tables were then added up to obtain the total intermediate use table in Mexico (Domestic). Finally, once we had the total intermediate use tables for Mexico (Domestic), yearly information for the final use of Mexico (Domestic) was included in order to obtain the total use table for the Domestic economy as proposed in figure 2. With the corresponding specific information for Maquiladora and for Manufactura Global, our research followed the same procedure in order to create time series of extrapolated total use tables for Mexico (Maquiladora) from 1998 to 2006 and, for Mexico (Manufactura Global) from 2007 to 2011.

The same approach was followed when creating the times series of extrapolated supply tables for Mexico (Domestic) and Mexico (Maquiladora/Manufactura Global). We used the SUT-RAS procedure to extrapolate the corresponding 2003 supply table with annual data on gross output according to the respective component of the Mexican economy. Once we had the time series of supply tables, we added them their corresponding information for total imports. In that way, we finally obtained time series of total supply tables for Mexico (Domestic) and Mexico (Maquiladora/Manufactura Global), respectively for the same period of time from the total use tables. Finally, with all those tables we ensure that basic accounting identity (total supply equals total use) was met for each component of the Mexican economy.

4.3 Data for the international SUTs from Mexico (Domestic) and Mexico (Maquiladora/ Manufactura Global).

In order to move from SUTs to international SUTs, Timmer et al. (2014) relied in the bilateral import data reported by each WIOD country in the UN COMTRADE database. The bilateral import data, reported at the 6 digit level from the Harmonized System (HS), was then allocated to three use categories (intermediate, final consumption and, investment) according to the Broad Economic Categories Classification (BEC). Given the lack of standardised bilateral service trade data, WIOD constructed their own database for services relying on different data sources (including OECD, Eurostat, IMF and WTO). Similarly, since there is not a service data classification for breaking services down according to the aforementioned use categories, WIOD relied on the information provided in existing import use or symmetric import IO tables.

[11] During the last years, INEGI has continuously updated the data for the IMMEX program. At the early stages of this research, IMMEX data for the total imported and domestic intermediate consumption was only reported. By 2015, such data reported per manufacturing sector has become available. Nevertheless, our research cannot use IMMEX data because official data for gross value added and gross output is still not available.

[12] From 1998 to 2006, yearly times series data for the Domestic Economy of Mexico and Maquiladora are available in current and constant prices of 2003. From 2007 to 2011, yearly times series data for Manufactura No Global and Manufactura Global are available in current and constant prices of 2008.

Once all the information from international trade statistics was gathered, WIOD calculated for each use category the share of imports of product ***i*** delivered by country A in the total imports of product ***i*** received by country B in that same use category. For instance, with the international trade data, they determined for the intermediate use category the share of the imports of chemical products delivered by Canada in the total intermediate imports of chemical products received by Mexico. Finally, those shares of use categories were applied to the total imports of product ***i*** as given in the SUT time series to derive imported use values. The shares (and not the actual values) from international trade statistics were used in order to ensure consistency between the data reported in the time series of extrapolated SUT and the international SUTs.

With this background information in mind, we can indicate all the necessary data to create international SUTs for Mexico (Domestic) and Mexico (Maquiladora/Manufactura Global). Transforming SUTs into international SUTs requires bilateral trade data. INEGI reports official bilateral trade data for Mexico (Domestic) and for Mexico (Maquiladora) from 1998 to 2006. Each product category at a 8 digit level from the Harmonized System is reported in three columns; one column reporting the imports (exports) made by Maquiladora firms, a second column with the imports (exports) made by non-maquila firms and, a third column (the sum of maquila and non maquila firms) indicating the total imports (exports) made by Mexico under that 8 digit level product category. As of 2007, bilateral trade data for the total economy of Mexico is only available.

In order to further extend our analysis to more recent years and to include the Manufactura Global our research did the following. Given that Manufactura Global by definition includes all the foreign firms that mainly import intermediate goods (at least 70% of their total imports) to process them and eventually export them as a final manufacturing good, we decided to implement the same criteria in our available bilateral data. This means that within each product category at the 8 digit level from the previous data base, we identified those products whose ratio of maquiladora imports (exports) to total imports (exports) was higher than 70%. In that way, we were able to obtain a list of 8 digit level codes from the Harmonized system that were the basis to distinguish trade data for Manufactura Global within the bilateral trade data from 2007 onwards. Similarly, those 8 digit level products that did not meet our criteria for Manufactura Global trade were treated as the bilateral data for Domestic Economy from 2007 onwards.

As for the case of the services, we faced the same problem as WIOD of not having a standardised service bilateral trade data base. Therefore, we decided to use the bilateral service data for Mexico provided by WIOD in their international SUTs. Given that “Other Business services” (the only service sector within Maquiladora) accounts for less than 2% of the total gross production of Maquiladora, we assumed that all the bilateral service data reported for Mexico by WIOD refer to bilateral service data of the Domestic Economy of Mexico. Nevertheless, in order to have bilateral service trade data for the maquiladora sector of “Other Business Services” we assumed that its import structure by country of origin was the same as the one reported for that same service sector in WIOD’s bilateral import data for Mexico.

Following the same reasoning, once we gathered all the necessary bilateral import data for each component of the Mexican economy, we only implemented the BEC intermediate use category to identify the intermediate goods in the Domestic Economy of Mexico. This means that we did not classify our bilateral import data in terms of the other two BEC use categories of final consumption and investment. There are several reasons for this. First of all, in our view, the bilateral import data for the Maquiladora and the Manufactura Global do not require

any additional classification as their import data (by definition) belongs to their imported intermediate consumption. Second of all, our research decided not to modify the bilateral import data for final consumption and investment initially reported for Mexico in WIOD given that also, by definition, that data corresponds to the Domestic Economy of Mexico. Just remember that neither the Maquiladora nor the Manufactura Global import goods for final consumption or investment. Therefore, the structure of the international use tables from Mexico in the section of final demand and gross capital formation as initially reported by WIOD will remain completely unaltered and simply relabelled as final demand and gross capital formation for Mexico (Domestic).

The next step was to identify the imported intermediate use share of product i delivered by country A in the total intermediate imports of product i from each component of the Mexican economy. Once we obtained those shares, we applied them to their corresponding total imports of product ***i*** as given in our imported use time series to derive imported use categories. Finally, the corresponding domestic use tables, the information for gross value added, gross production and total exports was included in order to have international use tables for Mexico (Domestic) and Mexico (Maquiladora/Manufactura Global) from 1998 to 2011 as proposed in figure 2.

The last step before including Mexico (Domestic) and Mexico (Maquiladora/Manufactura Global) into the WIOTs was to include those components of the Mexican economy into the structure of the international SUT from the rest of WIOD countries. In that context, we decided that the information for Mexico initially reported by WIOD in the structure of the international SUTs from the rest of WIOD countries corresponded to that of the Domestic Economy of Mexico. The main reason for this is that the Maquiladora industry only exports final manufacturing goods and by definition does not supply intermediate goods to other markets. Furthermore, exporting intermediate and final goods as well as capital goods (investment) is a role solely taken by the Domestic Economy of Mexico. Therefore, just as in the previous case, all the data for Mexico initially contained in the international SUTs from the rest of WIOD countries will be unaltered and simply relabelled as the one for Mexico (Domestic).

Nonetheless, bilateral data for the exports of Maquiladora and of Manufactura Global is still required in order to have complete international use tables for the rest of WIOD countries. So as to meet the aforementioned objective, our research also retrieved Maquiladora bilateral export data (by country of destination) from 1998 to 2006. Data for the bilateral exports of Manufactura Global was obtained with the same criteria we followed to identify its bilateral imports. This means obtaining codes at the 8 digit level of the HS whose ratio of maquila exports to total economy exports was higher than 70% and using those codes to retrieve Manufactura Global exports by country of destination from 2007 to 2011. Afterwards, we obtain the exports share by country of origin and applied them to their corresponding total exports of product ***i*** as given in our use tables from Maquila/Manufactura Global. Finally, that information of Maquila/Manufactura Global exports by country of origin and by product category was benchmarked with the corresponding information for final use reported in each WIOD country.

Finally, with all the required international SUTs for Mexico (Domestic), Mexico (Maquiladora/ Manufactura Global) and for the rest of WIOD countries, we proceeded to construct the WIOTs from 1998 to 2011. Following WIOD, we transformed all the international SUT into a world input-output structure by means of the “fixed product-sales structure” assumption. This assumption states that each product has its own specific sales structure irrespective of the industry where it is produced. Sale structure here refers to the proportions of the

output of the product in which it is sold to the respective intermediate and final demand users (Timmer et al., 2014).

Before presenting our main results, some considerations about the main methodological differences between Maquiladora and Manufactura Global should be addressed. According to INEGI (2014), Manufactura Global includes all firms under the IMMEX programme as well as firms in the domestic economy of Mexico not enjoying IMMEX benefits but mainly producing for export markets. This implies that Manufactura Global also includes some firms in the domestic economy of Mexico that mainly export intermediate goods to other countries to explicitly participate in global production networks. This becomes an issue because then the data for total exports in Manufactura Global does not solely include final manufactured goods (as in the case of Maquiladora exports) but also intermediate goods. In order to maintain the consistency between the data reported for the Maquiladora and that for the Manufactura Global we made the simplifying assumption that in both cases total exports consist only of final manufactured goods.

Two important factors support the assumption that intermediate exports are so modest they can be neglected. On the one hand, given that official data for the Maquiladora and for the Manufactura Global overlap from 2003 to 2006, our research can directly identify the share of Maquiladora production within Manufactura Global for those 3 years. The Maquiladora share is 71% for those years. The remaining 29% corresponds to the sum of final manufacturing exports from PITEX firms, the final goods from firms in the Domestic Economy whose production is mostly for exports[13] and, the intermediate goods produced by firms in the Domestic Economy that are exported for the production of a final good in a foreign market[14] . Unfortunately, there is no available data to find the share in Manufactura Global for the aforementioned firms. However, according to De la Cruz et al. (2011), exports of manufactured goods under the Maquiladora and PITEX programmes accounted for 85.4 percent of total manufactured exports of $195.6 billion US dollars in 2006. Therefore, with those arguments in mind, we are confident that bulk of exports contained in the data for Manufactura Global refers to final manufacturing goods and that the share of exported intermediates is modest.

An alternative way to further confirm our assumption is to look at the intermediate goods delivered by Mexico to the United States, its largest trading partner that receives around 90% of its total manufacturing exports (De

[13] The reader should note that Manufactura Global does not take into account the total production for exports from the Domestic Economy of Mexico. In this case, final goods from firms in the Domestic Economy whose production is mostly for exports refers to the following; firms that are mostly foreign owned located in the domestic economy of Mexico and that import most of their intermediate goods to produce a final good to be exported. This means those firms in the domestic economy of Mexico that are meeting two of the conditions established by INEGI to be considered a firm under Manufactura Global (being mostly foreign owned and have a ratio of at least 2/3 of their imported intermediate consumption with respect to their exports). For instance, the final goods exported by firm under the domestic economy that is not foreign owned Mexico and that use mainly domestic inputs for its final good are not considered as part of Manufactura Global.

[14] Manufactura Global does not include as well the total intermediate goods exported by the Domestic Economy of Mexico. In this particular case, the intermediate goods produced by firms in the Domestic Economy that are exported for the production of a final good in a foreign market refers to the following; subsidiaries of a foreign company that were located in the domestic economy of Mexico in order to produce intermediate goods that have to be exported for the production of a final good in a foreign market. For instance, if a firm in the domestic economy produces intermediate goods to be exported but such firm is not a subsidiary from foreign company (mostly of foreign owned), then its intermediate production will not be considered as part of Manufactura Global.

la Cruz et al., 2011). According to data from OECD.Stat (Trade in Value Added) recently available online, the share of Mexican intermediate goods in total intermediate imports received by the US is only 10%. This modest share can be observed from 2008 to 2011 and in all the years where data is available. Note that this 10% includes intermediate imports delivered to the US by firms in the domestic economy of Mexico. Therefore, the share of intermediate exports from Manufactura Global is substantially lower than 10%.

5 Results

5.1 Sources of intermediate inputs

This section presents descriptive statistics for the final manufacturing production from Mexico (Domestic) and Mexico (Maquiladora/M. Global), as well as their domestic and imported intermediate consumption (by country and region of origin).

Table 1 indicates the sectoral shares in gross manufacturing output for each of the two components of Mexican manufacturing distinguished in this paper . As can be seen, the sectoral structure of Mexico (Domestic) is more diversified than that of Mexico (Maquiladora/M. Global). The production of Mexico (Maquila/M. Global) is mainly concentrated in four manufacturing sectors namely, Electrical and Optical Equipment, Transport Equipment, Textiles and Other Manufacturing. In Mexico (Domestic) sectors with important shares in gross manufacturing output include sectors such as the Food sector, Coke and Petroleum, Chemical products, Basic Metals, Transport Equipment and so forth. A special case is that of textiles which seems to be experiencing progressively declining shares in the total production within each component of Mexican manufacturing. Finally, it is worth mentioning that most of the gross output from Mexico (Domestic) is supplied to the domestic market and to the United States, while almost the entire production from Mexico (Maquiladora/M. Global) is exported to the United States.

Table 1. Gross Output shares per manufacturing sector

	Mexico (Domestic)				Mexico (Maquiladora)		Mexico (M. Global)	
	1998	2006	2007	2011	1998	2006	2007	2011
Food, Beverages and Tobacco	21.1	26.6	27.2	28.9	0.5	0.9	0.9	0.6
Textiles and Textile Products	5.2	3.6	3.4	3.0	11.8	7.5	2.9	2.3
Leather, Leather and Footwear	1.5	1.0	0.9	0.8	0.6	0.3	0.2	0.2
Wood and Products of Wood and Cork	1.2	1.0	1.0	0.9	0	0	0	0
Pulp, Paper , Printing and Publishing	3.9	3.4	3.4	3.2	2.5	2	0.7	0.6
Coke, Petroleum and Nuclear Fuel	5.2	12.1	12.4	15.0	0	0	0	0
Chemicals and Chemical Products	10.5	14.8	15.1	12.5	0.2	0.2	1.8	1.9
Rubber and Plastics	2.8	3.6	3.5	3.5	2.2	3.1	1.8	1.7
Other Non-Metallic Mineral	3.8	4.4	4.4	3.7	0.6	1.9	0.7	0.5
Basic Metals and Fabricated Metal	9.2	11.3	11.0	10.8	3.3	3.3	4.4	4.4
Machinery, Nec	1.8	2.6	2.5	3.3	2	2.3	2.1	3.6
Electrical and Optical Equipment	14.8	5.1	4.9	4.0	51.6	54	46.4	38.4
Transport Equipment	16	8.3	8.2	8.2	17.8	17.5	32.3	38.5
Manufacturing, Nec; Recycling	3	2.3	2.2	2.2	6.9	7.1	5.9	7.3
Total	100	100	100	100	100	100	100	100

Sources: as described in section 4.

The data in Table 1 reveal the pattern of specialisation of the maquiladora industry during the last decade. The fact that the production of maquiladora is only concentrated in four manufacturing sectors suggests that producers supplying foreign markets have specialised in the sectors where Mexico has the greatest competitive advantages, Here, we are referring to the production of goods with a high weight-to-value ratio (fridges, non-collapsible furniture, etc.), those that involve just-in-time procedures (transport equipment) , those that benefit from NAFTA regulations (the production of flat-screens) and so forth.

The steady decline in the textile production for exports is associated with the emergence of more efficient producers in East Asia, which are strongly specialised in textiles and represent fierce competition for maquiladora producers. The response of maquiladora firms was to specialise in the manufacture of other textile goods, such as cotton products. These are the goods for which NAFTA offers the greatest protection for maquila producers.

Finally, the diversified structure of Mexico (Domestic) indicates that this segment of the Mexican manufacturing sector is not practicing the pattern of specialisation observed in Mexico (Maquiladora/M.Global). This is because the production of Mexico (Domestic) is mainly supplied to the domestic market and does not face significant pressures from foreign low-cost producers.

Table 2 presents the intermediate consumption for the total manufacturing production of Mexico (Domestic) and for three important sectors within that segment of the economy[15].This table explicitly indicates the origin of the intermediate inputs (domestic or specific country or region of origin). From 1998 to 2011, Mexico (Domestic) itself is the main source of intermediate goods used by the manufacturing firms in Mexico (Domestic). During those years, the share of Mexico (Domestic) in the total intermediate goods used by Mexico (Domestic) is more than 70% with little variation over time. The share of the US is 20%, while the other countries account for the remaining 10%.

The aggregate pattern in which Mexico (Domestic) supplies most of the intermediate inputs used by Mexico (Domestic), can also be observed for two of the three subsectors included in the table. During the years under consideration, the Transport sector sourced more than 54% of its intermediate inputs from Mexico (Domestic), The corresponding figure for textiles was more than 70%. Electrical and Optical equipment is the only exception. In 1998, this sector was primarily using intermediate goods produced by Mexico (Domestic) producers. By 2011 US accounted for the highest share of intermediates, while there had been dramatic increases in the share of China. Japan and South Korea also increased their intermediate input shares between 1998 and 2011.

[15] We decided to focus on the trends observed in the Electrical and Optical Equipment sector, Transport Equipment and Textiles and Textiles products both for the case of Mexico (Domestic) and Mexico (Maquiladora/M. Global). In our view point, analysing those sectors allows us to better understand the new pattern of manufacturing specialisation at the Maquiladora industry. According to table 1, since 1998, Electrical and Optical Equipment and Transport Equipment represent more than 70% of the total manufacturing production in Maquiladora. The textile industry also provides an interesting case, given the dramatic decline of its share in total maquiladora output (from 11% in 1998 to 2.3% in 2011). Finally, we extend the analysis of those sectors for the case of Mexico (Domestic) to allow for comparison between the two segments of Mexican manufacturing.

Table 2. Intermediate inputs used in manufacturing in Mexico (Domestic), by region of origin (%)

	Total Manufacturing production		Textile and Textiles products		Electrical and Optical Equipment		Transport Equipment	
	1998	2011	1998	2011	1998	2011	1998	2011
Mexico (Domestic)	70.6	67.0	76.3	69.9	40.8	31.5	53.8	54.8
NAFTA								
United States	20.0	19.9	15.7	18.7	38.4	36.0	36.6	26.2
Canada	0.6	1.1	0.2	0.2	1.0	1.0	1.1	1.6
East Asia								
China	0.3	2.2	0.1	4.3	1.5	9.6	0.1	2.7
Japan	1.1	1.5	0.2	0.1	4.0	5.5	1.4	6.3
South Korea	0.3	0.6	1.7	0.6	0.3	1.6	0.0	0.8
Taiwan	0.3	0.3	0.7	0.6	1.2	1.2	0.3	0.3
Europe								
Germany	1.9	1.6	0.5	0.5	4.3	3.7	5.2	3.1
France	0.5	0.4	0.1	0.1	1.7	1.3	0.2	0.3
United Kingdom	0.3	0.2	0.1	0.1	0.6	0.4	0.1	0.1
Rest of Europe	1.8	2.3	1.2	1.7	4.0	3.3	0.6	1.9
Rest of the World	2.2	2.9	3.0	3.1	2.2	5.0	0.6	1.9
Total intermediate inputs	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Sources: as described in section 4.

Table 3 presents the origin of intermediate inputs for Maquiladora (upper panel) and Manufactura Global (lower panel). There are substantial differences compared to the figures for Mexico (Domestic) in table 2. In 1998, US producers provided more than 84% of the total intermediate inputs used by Maquiladora firms. Only 8.5% was sourced from Mexico (Domestic). The remaining 12% consisted of intermediate goods from the rest of the world. By 2006, the US share had dropped to 42.5 per cent, while the shares of East Asia and the rest of the world increased dramatically. By 2011 a dramatic diversification had taken place, as can be observed in the figures for the intermediate input structure of Manufactura Global. In that year, US producers provided 32% of the total intermediate goods, East Asian countries 30%, Mexico (Domestic) 22.5% and Europe 7.1% with the remaining share coming from the rest of the World.

The steady and sharp decline of the US share in intermediate goods in Maquiladora/M. Global can be observed in every single manufacturing sector. In the case of the textile industry, the decline in US shares was accompanied by a slight increase in the intermediate inputs supplied by Mexico (Domestic) and a steady (but still modest) increase of East Asian inputs. In the case of Transport Equipment, the decline in US inputs is mainly associated with a continuous increase in the inputs supplied by Mexico (Domestic) and, to a lesser extent, to the inputs produced in Europe and East Asia.

The most interesting case is the Electrical and Optical Equipment sector, which is the largest sector within Maquiladora/M. Global. As of 2006 East Asia became the most important supplier of intermediate inputs. In 1998, the share of East Asian countries in the intermediate inputs of this sector was only 8%. By 2011, it had increased to 50%. The share of US inputs declined from 84% to 27%, while the share of Mexico (Domestic) nearly doubled (from 5% to 10%) during the period under consideration

Our data indicate that the increasing globalisation of production has had different effects on the domestic and imported origin from the inputs used by each segment of the Mexican manufacturing production. First of all, over the last decade, firms in Mexico (Domestic) have remained highly dependent on the intermediate inputs also produced by Mexico (Domestic). Drastic reductions in transport and communications costs have only altered the intermediate input structure in the Electrical and Optical equipment sector that receives more of its intermediate inputs from US and from East Asia than from Mexico (Domestic). Nevertheless, that change is compensated by the relatively unchanged intermediate input structure of the rest of the manufacturing sectors.

On the other hand, firms in Mexico (Maquiladora/M. Global) faced major changes in the domestic and foreign origin of their intermediate consumption. In our view, these changes are a response of maquiladora to its new pattern of specialisation. In order to properly take advantage of the benefits offered by NAFTA, by the Maquiladora/IMMEX programme and by the areas where Mexico offers a competitive advantage, the export producers had to drastically modify the sourcing of their intermediate inputs. At the aggregate level, Maquiladora substantially reduced its dependence on US intermediate inputs in favour of progressively more inputs from East Asia (China). At the sectoral level, however, a more diversified structure of intermediate sourcing is observed with some sectors using more inputs from China, other sectors using more inputs from the US and, some others more from Mexico.

In sum, we may draw the following conclusions with regard to the manner in which Mexican manufacturing industry responds to the increasing globalisation of production. Firms mostly producing for the domestic market (those in Mexico-Domestic) operate in the context of local value chains with most of the value being added by Mexico-Domestic. The firms producing for exports (those in Mexico-Maquiladora) are part of local, regional and global value chains. Whether firms in Maquiladora belong to local, regional or global value chains depends on the types of goods being produced, trade and tariff incentives, as well as the competitive advantages offered by Mexico. This will be further examined in our value added calculations in the next section.

Table 3. Share of intermediate inputs used in the manufacturing production from Mexico (Maquila)

	Total Manufacturing production		Textile and Textiles products		Electrical and Optical Equipment		Transport Equipment	
	1998	2006	1998	2006	1998	2006	1998	2006
Mexico (Domestic)	8.5	10.9	12.5	16.0	5.6	6.8	7.5	14.2
NAFTA								
United States	84.5	42.5	85.2	71.0	83.6	29.5	90.2	62.4
Canada	0.3	1.3	0.2	1.5	0.3	0.8	1.0	5.9
East Asia								
China	0.6	12.7	0.2	5.2	0.8	16.2	0.5	4.1
Japan	1.8	7.9	0.1	0.4	2.8	12.6	0.2	3.5
South Korea	1.7	7.6	0.4	0.8	3.0	12.6	0.0	2.3
Taiwan	0.8	3.6	0.5	0.9	1.1	5.9	0.5	0.3
Europe								
Germany	0.2	1.0	0.1	0.5	0.2	1.0	0.0	1.5
France	0.2	0.3	0.0	0.1	0.3	0.3	0.0	0.2
United Kingdom	0.0	0.4	0.0	0.1	0.0	0.3	0.0	1.0
Rest of Europe	0.2	1.6	0.2	0.9	0.2	1.7	0.0	1.2
Rest of the World	1.3	10.2	0.5	2.7	2.0	12.2	0.1	3.5
Total intermediate inputs	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Sources: as described in section 4.

Table 3. Share of intermediate inputs used in the manufacturing production from Mexico (M. Global)

	Total Manufacturing production		Textile and Textiles products		Electrical and Optical Equipment		Transport Equipment	
	2007	2011	2007	2011	2007	2011	2007	2011
Mexico (Domestic)	19.7	22.5	17.2	17.6	11.5	10.1	31.8	40.1
NAFTA								
United States	35.0	32.2	61.0	53.6	27.2	26.6	46.1	39.5
Canada	1.4	1.3	1.5	2.0	0.8	0.6	3.7	3.1
East Asia								
China	12.7	17.5	5.7	9.7	17.2	27.7	1.8	2.0
Japan	6.6	5.3	0.5	0.3	10.5	9.4	4.6	5.2
South Korea	6.8	5.1	0.7	1.0	13.4	10.1	0.5	1.6
Taiwan	3.0	1.6	1.2	1.0	5.5	2.8	0.4	0.5
Europe								
Germany	2.8	2.8	1.1	1.7	2.1	2.6	5.9	4.2
France	0.6	0.7	0.2	0.1	0.4	0.4	0.5	0.4
United Kingdom	0.5	0.5	0.1	0.1	0.3	0.3	0.2	0.1
Rest of Europe	2.9	3.1	3.9	3.6	2.3	2.3	1.5	1.8
Rest of the World	8.2	7.4	7.0	9.3	8.9	7.2	2.9	1.6
Total intermediate inputs	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

5.2 The structure of value added contributions

This section describes the structure of value added contributions embodied in the final manufacturing output (at industry and sector level) of the different segments of the Mexican manufacturing sector: Mexico (Domestic), Mexico (Maquiladora/M. Global) and Mexico (Total economy). The question here is which countries and regions capture most of the value added embodied in Mexican manufacturing production and to what extent Mexico itself profits from its manufacturing production. The value added contributions have been derived using equation (1) and distinguish both domestic and foreign value added content (by country and region of origin). Particular attention is paid to the value added contributions of Mexico and the different patterns found for Mexico (Maquiladora/M. Global) and Mexico (total economy).

5.2.1 The Domestic Economy of Mexico

Figure 3 indicates the structure of value added contributions by region of origin in the aggregate final manufacturing output of the Mexican Domestic sector (Mexico Domestic) from 1998 to 2011. The figure shows that the value added contribution from Mexico (Domestic) and from different regions did not change much over time. The value added contribution from Mexico (Domestic) was always above 74%. US/Canada and Europe saw their contribution decrease at the expense of an increase in the East Asian contribution. East Asian countries more than doubled their combined value added contribution in the final output from Mexico (Domestic). By 2009 their share is higher than that of Europe. Nevertheless, the value added from both East Asia and Europe remains significantly lower than that of US/Canada.

Figure 3. Share of value added content of total final manufacturing output in Mexico (Domestic), by region of origin

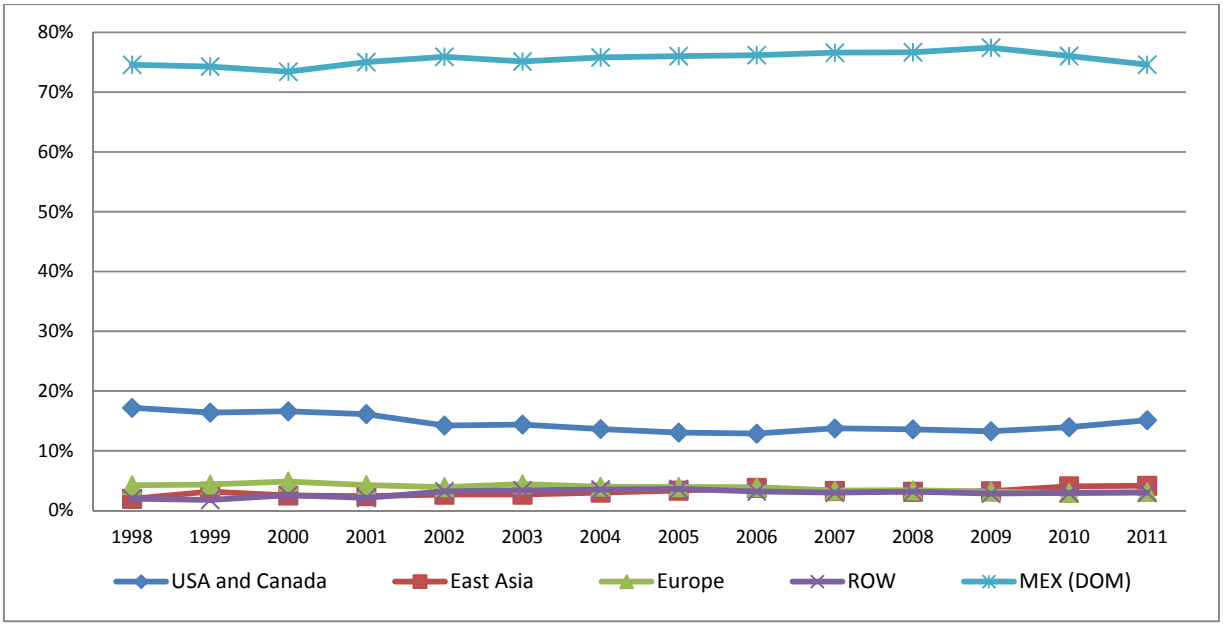


Table 4 presents the evolution of the structure of value added contributions for three manufacturing sectors in Mexico (Domestic) for selected years[16].

Table 4. Share of regional value added content embodied in final manufacturing output produced by Mexico (Domestic). Selected manufacturing sectors.

Textiles and Textile Products

	Domestic Economy of Mexico			
Region	**1998**	**2000**	**2005**	**2011**
USA and Canada	17.0	18.6	13.9	12.4
East Asia	2.8	3.8	4.5	4.0
Europe	2.9	2.7	3.4	2.2
ROW	3.2	2.9	3.7	3.0
MEX (DOM)	74.1	71.9	74.6	78.5
Total final output	100	100	100	100

Transport Equipment

	Domestic Economy of Mexico			
Region	**1998**	**2000**	**2005**	**2011**
USA and Canada	27.0	26.7	22.2	19.0
East Asia	2.0	2.9	3.6	7.8
Europe	5.1	5.4	6.0	4.5
ROW	1.2	1.8	3.2	3.0
MEX (DOM)	64.7	63.2	65.0	65.7
Total final output	100	100	100	100

Electrical and Optical Equipment

	Domestic Economy of Mexico			
Region	**1998**	**2000**	**2005**	**2011**
USA and Canada	35.3	32.5	23.8	31.0
East Asia	6.6	7.8	15.7	14.7
Europe	10.0	11.5	11.9	8.3
ROW	3.0	6.0	8.0	6.7
MEX (DOM)	45.2	42.2	40.7	39.3
Total final output	100	100	100	100

[16] In section 5, we mentioned the reasons why this research decided to focus only on three manufacturing sectors. Nevertheless, the appendix A.2 to this research provides the evolution of the structure of the value added contribution for all manufacturing sectors from 1998 to 2011. Such information is provided both for Mexico (Domestic) and Mexico (Maquila/M. Global).

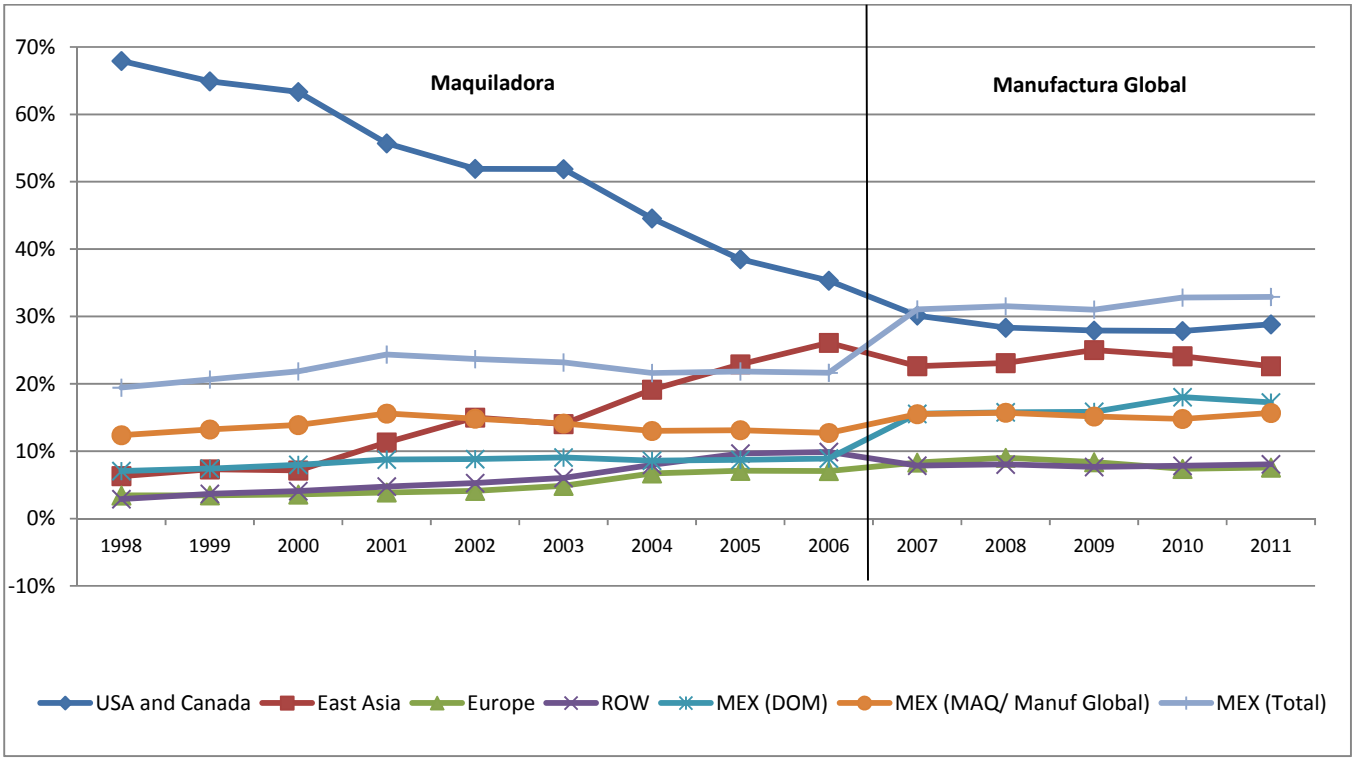
As at the aggregate level, the three sectors have remarkably high and stable domestic contributions to value added. Electrical and Optical equipment is the only exception. This is the manufacturing sector in Mexico (Domestic) with the lowest domestic value added contribution, which has also been declining over time (45% in 1998 and 39% by 2011). The increase of the contributions of East Asian countries is responsible for this decline as well as for the decline of the shares of US/Canada and Europe within the same sector. The East Asian share doubled from 6.7% in 1998 to 14.7% in 2011. According to our data, China drives this increase, in the light of its tenfold increase in value added share in this short period.

In sum we may infer that the increasing value added contribution from East Asian countries (notably China) in the Electronic and Optical equipment produced by Mexico (Domestic) is the factor driving the increase in the value added contribution of this region in the aggregate output of Mexico (Domestic). Nevertheless, the East Asian share in total industry still remains modest, given the remarkably shares of high value added originating in Mexico (Domestic) and the importance of NAFTA neighbours (US/Canada) in most of the other manufacturing sectors.

5.2.2 Maquiladora Industry (1998-2006) and Manufactura Global (2007-2011)

Compared to Mexico (Domestic), a completely different story can be observed in the case of structure of value added shares in Mexico (Maquiladora/M. Global). Figure 4 presents the value added contribution by country of origin in the aggregate final manufacturing output produced by Mexico (Maquiladora/M. Global). Given the difference in coverage of the firms included in the Maquiladora industry and those included in Manufactura Global, figure 4 is divided into two panels, the first referring to Maquiladora, the second to Manufactura Global.

Figure 4. Value Added contribution (by country of origin) in Mexico (Maq/M. Global) Total final manufacturing output.



As mentioned previously, the value added contributions from Mexico (Maq./M. Global) and from Mexico (Domestic) are considered separately for the case of final manufacturing output produced by Mexican Maquiladora/Manufactura Global sector. The sum of the value added contribution from Mexico (Maq./M.Global) and from Mexico (Domestic) is equal to the total domestic value added embodied in the Maquiladora/M. Global final manufacturing production. This total domestic value added contribution is also represented in figure 4 as Mexico (Total). For all years in figure 4 for which data for the Maquiladora were available, we observed that value added share of Mexico (Maquiladora) was higher than that of Mexico (Domestic) with 12.4% versus 7.1% in 1998 and 12.7% versus 8.9% by 2006, respectively. When considering the joint contribution from Mexico (Maquiladora) and Mexico (Domestic), i.e. the total domestic value added contribution in Maquiladora production represented by Mexico (Total), we observed the same cyclical behaviour – increases till 2001, decreases thereafter – as described by Castillo & De Vries (2014).

In our view, this cyclical behaviour is mainly related to external shocks and changes in the international trade environment and not to changes in the domestic regulatory environment. Our detailed data allow us to conclude that those external shocks have mainly affected the value added contributions from Mexico (Maquiladora), with the contributions from Mexico (Domestic) remaining unaltered. The US crisis and China's entrance to the World Trade Organization (WTO) in 2001 (the first external shock considered in our research) induced a steady decline in the value added contribution from Mexico (Maquiladora) from a peak 15.6% in 2001 to 12.7% in 2006. This went hand in hand with a loss in employment experienced by maquila producers after 2001.

We see that the value added contribution from Mexico (Domestic) in Maquiladora production did not significantly change over time. It even showed a marginal increase from 7% in 1998 to 9% in 2006. The value added contribution from Mexico (Domestic) is perhaps the most relevant one, given that it reflects the degree to which Mexican manufacturing suppliers succeed in interacting more effectively with foreign producers in order to trigger more benefits of exports for the rest of the economy (inducing for instance a process technological learning). The fact that the value added contribution in Maquiladora production remained below 9%, indicates that Mexican suppliers were unable to meet the input requirements of foreign firms producing for export in Mexico.

From 2007 onwards. we see that the value added contribution from Mexico (Domestic) in the total final manufacturing output from Mexico (Manufactura Global) is higher than the one from Mexico (Domestic) in Mexico (Maquiladora). This is linked to the increase in the value added contribution from Mexico (Domestic) between 2006 and 2007, when the analysis shifts from Mexico (Maquiladora) to Mexico (Manufactura Global) in figure 4. The main factor behind the higher value added from Mexico (Domestic) embodied in Mexico (Manufactura Global) is that the corresponding data for Manufactura Global include not only the Maquiladora firms, but also those in the PITEX programme, as well as firms in the Domestic Economy that are highly engaged in global production networks. Therefore, the figures from 2007 to 2011 are not strictly comparable to those from 1998 to 2006.

Despite its higher value from 2007 to 2011, the trend in the value added contributions from Mexico (Domestic) in the total final manufacturing output of Mexico (Manufactura Global) is similar to that from 1998 to 2006. There is a modest net increase in its share (from 15.5% in 2007 to 17.2% in 2011) and just as in the case of

Maquiladora, the share does not seem to have been severely affected by external shocks (in this case the financial crisis in 2008).

The value added contribution of Manufactura Global to its own final output shows more volatility. During the transition from Mexico (Maquila) to Mexico (M. Global), the value added contribution from Maquiladora increases from 12.7% in 2006 to 15.6% by 2007. As in the case of Maquiladora, Mexico (Manufactura Global) seems to be sensitive to external shocks. As a result of the financial crisis in 2008, the value added contribution from Mexico (Manufactura Global) decreased from 15.7% in 2008 to 14.8% in 2010, with some recovery by 2011. The value added decrease after 2008 reflects the hiring of less workers as a result of firms under Manufactura Global reducing their output or shutting down.

In our view, the value added contributions from Mexico (Manufactura Global) and Mexico (Domestic) in the total final manufacturing output of Mexico (M. Global) from 2007 to 2011 follow patterns similar to those observed for Mexico (Maquiladora) between 1998 and 2006. On the one hand, given the lack of variation and lack of substantial increase observed in the contribution from Mexico (Domestic), we may conclude that manufacturing firms in Mexico supplying domestic inputs to IMMEX firms (and to those other firms highly engaged in global production networks) are still far from meeting the requirements of foreign producers. These producers seek to export to one of the major markets in the World (the United States) and Mexican suppliers to Manufactura Global have not been able to meet their competitive standards. When comparing the contribution from Mexico (Domestic) and Mexico (Manufactura Global) in the total output from Manufactura Global, we can see that contribution from Mexico (Domestic) has become slightly higher than that of Mexico (M. Global). Nevertheless, just as in case of Maquiladora, the fluctuations in the total domestic value added embodied in M. Global can still be attributed to the changes in the value added contributions from Manufactura Global.

Figure 4 also indicates the value added contribution from non-Mexican countries in the final manufacturing production of Mexico (Maquiladora) and Mexico (Manufactura Global). We observe a dramatic decline in the value added contribution from US/Canada producers over time. In 1998, the value added contribution from US/Canada producers to the total final manufacturing output from Mexico (Maquiladora) was 68%. By 2006, the last year for which Maquiladora data was available, the US/Canada value added contribution had declined to 35%. This decline continues from 2007 to 2011. By 2011 the share of US/Canada was 29%. Given the small increases and minor variations in the total domestic value added embodied in the final manufacturing output of Maquiladora and M. Global, we can indicate that an increase in the value added contribution from East Asian producers was mainly achieved at the expense of the US/Canada value added contributions to final output

In 1998, the joint value added contribution from East Asian producers in the final manufacturing output from Mexico (Maquiladora) was 6.3%. At that time, it was already larger than the share of Europe (3.4%) and that of the rest of the world (2.7%), but it was ten times smaller than the joint contribution from US/Canada. In 2006, the joint contribution from East Asia in Maquiladora production was of 26%. In 2011 its contribution was 23% of the final output in Manufactura Global. During those years, the country that was mainly driving the increasing East Asian value added content was, of course, China. By 2005, the individual contribution from China in Maquiladora production surpassed that of Japan and by 2011, Chinese producers accounted for half of the total East Asian value added embodied in Manufactura Global final manufacturing output.

We find that during the last decade (the 2000s) the increasing globalisation of production induced two effects in the value added structure embodied in the Mexican production of final manufactured goods that are mainly exported to the US. On the one hand, it induced dramatic shifts in the value added contributions from foreign producers participating in the production of Mexico (Maquila/Manufactura Global), with NAFTA neighbours adding progressively less value added in the total final manufacturing output and East Asia steadily adding more and more. This is the consequence of US producers outsourcing increasing parts of production for intermediate use to Asia. Thus global value chains become more complicated. In the earlier period, producers in the USA provide inputs to Mexican producers, producing final goods for the US market. Later, American producers relocated their activities to Asia and provide inputs for Mexican exporters via Asia.

On the other hand, the increasing globalisation of production did not significantly alter the structure of domestic value added contributions to Mexico (Maquiladora/M. Global). From 1998 to 2006, the value added contribution from the firms in the Domestic Economy of Mexico did not show any signs of dramatic increase or decline due to the increasing globalisation of production faced by Maquila producers. Similarly, the corresponding value added of Mexico (Domestic) embodied in Manufactura Global from 2007 to 2011 does not seem to have changed drastically. In this context, the variations in the total domestic value added of Mexico (Maquiladora/M. Global) mainly reflect the response (expansion/contraction) of the volume of low qualified employment to the external shocks in 2001 and 2008.

In the end, the main outcome induced by the increasing globalisation of production during the 2000s has been a drastic diversification in the value added contributions by country of origin to the final manufacturing output in Mexico (Maquiladora/M. Global). According to figure 4, this process of value added diversification has become more pronounced since 2005 and it has become deeper over time. For instance, by 2010 the domestic value added contribution of Mexico (Total) in Manufactura Global production was 33%, that of US/Canada was 28%, the of East Asia 24%, that of Europe 8.4% and that of the rest of the World 7.7%.

Table 5 presents the structure of value added contributions per manufacturing subsector for selected years for Mexico (Maquiladora) and Mexico (M. Global) respectively. As can be seen, the decline in the shares of US/Canada producers and, the corresponding diversification of the value added structure observed at the aggregate level can also be observed at the sectoral level. In the case of the textile industry, we see that loss in US/Canada value added contributions went hand in hand with gains of textile producers in East Asia (notably China), but also of those in Europe and the rest of the World. The joint contribution from Mexico (Domestic) and Mexico (Maquiladora/Global), i.e. the total domestic value added embodied in the final manufacturing output remained between 28 and 33% and thus it was not drastically modified. Once more, we can see that firms in Mexico (Domestic) supplying inputs to Maquiladora/M. Global were unable to profit from the decline in US/Canada value added and did not increase their share in value added contributions. The value added from Maquiladora/M. Global suffered minor variations related to the sensitivity to the external shocks in 2001 and 2008.

The most drastic change can be observed in the case of the Electric and Optical equipment. In Mexico (Maquiladora) from 1998 to 2006, the US/Canada share in value added embodied in final manufacturing output declined from 70% to 28%, while East Asia increased its share from 9% to 38%. Such trends continued in the years for which data for Mexico (Manufactura Global) were available. By 2011, the corresponding share for East

Asia was 39% while that of US/Canada was 26%. Just as in the case of the textile industry, the contribution of Mexico (Domestic) and Mexico (Maquiladora/M. Global) remained low and did not change substantially.

Table 5. **Share of regional value added embodied in final manufacturing output produced by Mexico (Maquiladora/M. Global). Selected manufacturing sectors.**

Textiles and Textile Products

	Maquiladora		M. Global	
Region	**1998**	**2000**	**2005**	**2011**
USA and Canada	64.4	51.6	46.8	39.0
East Asia	2.7	7.7	8.5	12.3
Europe	3.0	4.3	6.6	6.3
ROW	1.9	4.6	6.8	8.8
MEX (DOM)	9.4	11.7	12.5	12.3
MEX (MAQ/ Manuf Global)	18.7	20.2	18.9	21.3
Total final output	100	100	100	100

Transport Equipment

	Maquiladora		M. Global	
Region	**1998**	**2000**	**2005**	**2011**
USA and Canada	71.7	49.6	35.4	31.3
East Asia	3.5	10.1	7.4	8.6
Europe	3.2	6.1	7.6	6.1
ROW	2.1	5.9	4.5	3.9
MEX (DOM)	6.5	11.4	22.8	28.1
MEX (MAQ/ Manuf Global)	13.0	17.0	22.2	22.1
Total final output	100	100	100	100

Electrical and Optical Equipment

	Maquiladora		M. Global	
Region	**1998**	**2000**	**2005**	**2011**
USA and Canada	69.6	28.1	26.1	25.7
East Asia	8.7	37.9	36.3	39.2
Europe	3.8	7.8	8.6	7.8
ROW	3.6	11.4	9.8	10.6
MEX (DOM)	5.0	6.0	9.9	8.6
MEX (MAQ/ Manuf Global)	9.3	8.8	9.4	8.2
Total final output	100	100	100	100

Transport equipment shows a somewhat different trend in its value added structure. Here, we can also see that the value added contribution of US/Canada has substantially declined both in the case of the final output in Mexico (Maquiladora) and in Mexico (Manufactura Global). But in this industry, these declines go hand in hand with increasing value added contributions from Mexico (Domestic) and Mexico (Maquiladora/M. Global). From 1998 to 2006, it can be seen that firms in Mexico (Domestic) nearly doubled their value contribution in the final output of the transport sector from Mexico (Maquiladora). The value added from Mexico (Maquiladora) also steadily increased, despite a temporary contraction as a result of the external shock in 2001. The joint value added contribution from firms Mexico to the final transport production in Mexico (Maquiladora) increased from 20% in 1998 to 29% by 2006.

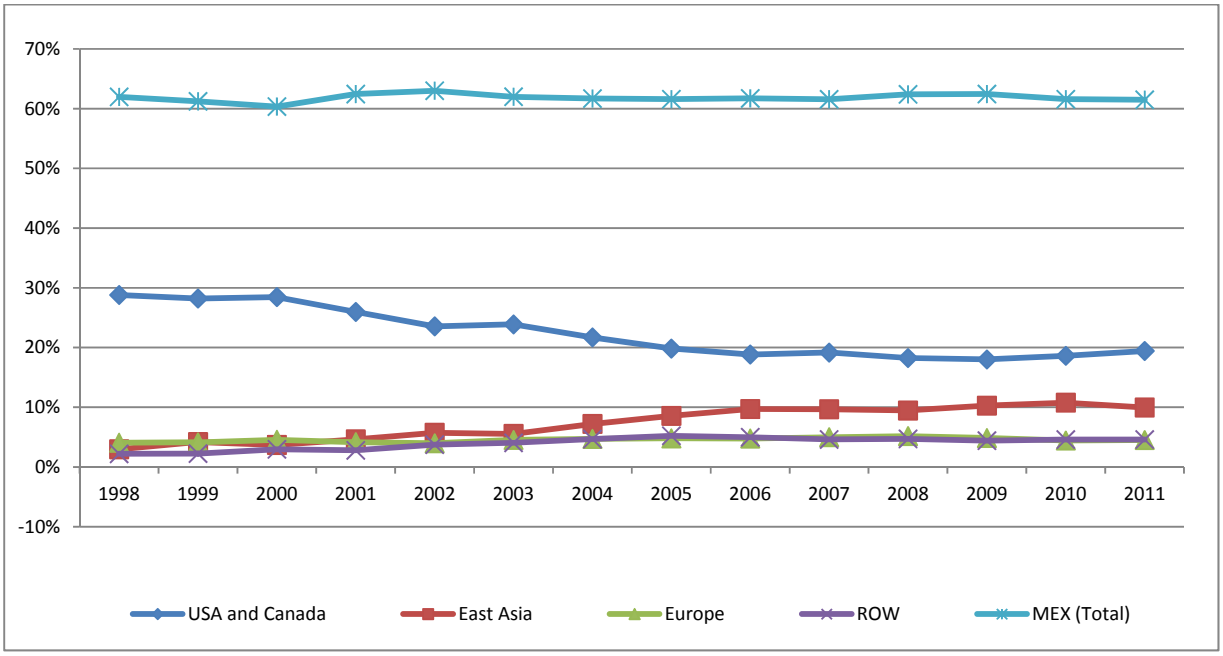
In the years after 2007 when the data for Mexico (Maquiladora) are replaced by data for Mexico (Manufactura Global), we see that the corresponding value added for Mexico (Domestic) nearly doubles from 2006 to 2007. This situation is mainly because of the larger population of firms included under the concept of Manufactura Global. Nevertheless, between 2007 and 2011 we also see that general upward trend for the automotive sector in the Maquiladora also continues in the case of the Manufactura Global. There is a continuous decline in US/Canada value added contributions , while the value added share of Mexican firms increases. By 2011, the value added contribution from Mexico (total economy) in the transport equipment sector from Manufactura Global was 50%, the one from US/Canada 31%, East Asia 8.6%, Europe 6.1% and the rest of the world 4%.

5.2.3 Total Economy of Mexico (1998-2011)

Figure 5 presents the evolution from the structure of value added contributions embodied in the final manufacturing output produced by the total economy of Mexico. The figures were obtained by adding the value added structure from Mexico (Domestic) and the one from Mexico (Maquiladora/M. Global). The figure shows that the value added structure of Mexico (total economy) resembles the value added structure of Mexico (Domestic). As before, we observe that the substantial decline in the US/Canada value added embodied in Maquiladora/M. Global production is largely dampened by the value added contribution from US/Canada in the final output from Mexico (Domestic). As a result the decline of the value added contribution of US/Canada in the total manufacturing sector in figure 5 is less dramatic than in figure 4.

Figure 5 also indicates an increasing contribution from East Asia in the total final manufacturing output produced in the total economy of Mexico. According to our data, the main source of this increase is the higher levels of value added from East Asian producers identified in the production of Electrical and Optical Equipment by Mexico (Domestic) and, to a much greater extent, in the production of Electrical and Optical Equipment by Mexico (Maquiladora/M. Global).

Figure 5. Value added contribution (by country of origin) in Mexico (total economy) final manufacturing output.



Our data also allow us to break down each country's value added contributions in the total final manufacturing output of Mexico (total economy), according to whether these contributions are made in the domestic sector or in the Maquiladora/Manufactura General sector. The data are reproduced in table 6. First of all, firms in Mexico (Domestic) account for the largest share in the total value added structure of Mexico (total economy). The contribution of the domestic component decreased during the years studied here (from 57.5% in 1998 to 51.1% in 2011). Second, the value added contribution from the firms in Mexico (Domestic) sourcing intermediate inputs to firms in Mexico (Maquiladora/M. Global) increased from 1.6 to 5.4%. Finally, the value added contribution from the firms in Mexico (Maquiladora/M. Global) was less than 5% with some decline due to the external shocks of 2001 and 2008.

Of the three key manufacturing sectors considered in this paper, Transport Equipment and Textile products are the sectors that contribute the most to the total domestic value added in Mexico (Total). Nonetheless, in our view, the value added contribution from the Transport Equipment sector is the most important for total manufacturing in Mexico. This is mainly because of changes in the shares of textiles and transport equipment in the gross production of Mexico (Domestic) and Mexico (Maquila/M. Global), as described in Table 1. In spite of the fact that the textile industry has a higher level of domestic value added in its total output than the transport sector, the textile industry has been experiencing a continuous decline in its share in the total output in each segment of the Mexican industry over time. Therefore, the opportunities for Mexico to pursue a process of upgrading (a higher level of domestic value added content) are primarily to be found in the transport sector.

We can now indicate how the effects from the increasing globalisation of production express themselves in the structure of value added contributions for Mexico (total economy). On the one hand, the steady decline in the sourcing of intermediate inputs from US/Canada producers in the three most important manufacturing sectors in Mexico (i.e. Textiles, electrical and optical equipment and transport) resulted in a decline of the US/Canada value added share that can be observed at all three levels of analysis (Domestic, Maq./M.Global and, total). This decline offered opportunities for an increase in the value added share of foreign and domestic producers that were differently exploited, depending on the sector in question. East Asian producers gained significant value added shares in the Electronic and optical equipment production in Mexico (Domestic) and even more so in Mexico (Maq./M. Global), where they now account for the largest share.[17] This increase in electronics is the main source of the increasing East Asian value added share observed at the aggregate level in the total production of Mexico (total economy). On the other hand, firms in Mexico (Domestic) and Mexico (Maq./M. Global) have succeeded in increasing their value added share in the transport equipment and textile sectors. The increases in those two manufacturing sectors, however, have not been sufficient to achieve higher levels of domestic value added shares in the final manufacturing output of Mexico (Total). In the period studied, the total domestic value added share in Mexico (Total) has not changed much. There has been a minor decrease from 62% in 1998 to 61.5% in 2011.

[17] The manufacturing subsectors within the Electrical and Optical equipment sector that do not enjoy an important modularity in their production (ovens, fridges, heaters) were less likely to reallocate their production in East Asian and opted for Mexico instead. But, the sector as a whole did increase its share in value added contributions.

Table 6. Share in value added content of final manufacturing output by region/country of origin in Mexico (Total economy)

		Total Manufacturing production		Textile and Textiles products		Electrical and Optical Equipment		Transport Equipment	
		1998	2011	1998	2011	1998	2011	1998	2011
Mexico	(Domestic Mx)	57.5	51.1	44.1	58.4	23.1	16.0	50.9	34.2
	(Domestic to MAQ/M.G.)	1.6	5.4	3.8	3.1	2.5	5.1	1.4	13.5
	(MAQ/M.G.)	2.8	4.9	7.6	5.4	4.5	4.9	2.8	10.6
	Total Mexico	62.0	61.5	55.4	67.0	30.1	25.9	55.1	58.3
United States	(Domestic Mx)	12.7	9.7	9.9	8.9	17.5	12.1	20.5	9.2
	(MAQ/M.G.)	15.2	8.5	25.7	9.5	33.4	14.7	14.9	13.8
Canada	(Domestic)	0.6	0.6	0.3	0.3	0.6	0.6	0.8	0.7
	(MAQ/M.G.)	0.3	0.6	0.5	0.5	0.6	0.6	0.4	1.2
	Total US and Canada	28.8	19.4	36.3	19.2	52.0	27.9	36.5	24.9
China	(Domestic Mx)	0.3	1.4	0.2	2.2	0.7	3.2	0.1	1.3
	(MAQ/M.G.)	0.2	3.8	0.3	2.4	0.6	12.6	0.2	1.5
Japan	(Domestic Mx)	0.9	1.1	0.3	0.2	2.0	1.9	1.1	2.3
	(MAQ/M.G.)	0.7	1.9	0.4	0.3	2.1	5.5	0.3	2.0
South Korea	(Domestic Mx)	0.2	0.2	0.8	0.3	0.2	0.5	0.1	0.3
	(MAQ/M.G.)	0.3	1.1	0.2	0.2	1.1	3.8	0.1	0.5
Taiwan	(Domestic Mx)	0.2	0.1	0.3	0.2	0.5	0.4	0.2	0.1
	(MAQ/M.G.)	0.2	0.4	0.2	0.2	0.6	1.3	0.1	0.2
	Total East Asia	3.0	10.0	2.7	6.1	7.6	29.2	2.3	8.2
Germany	(Domestic Mx)	1.3	0.7	0.4	0.4	1.9	1.2	2.6	1.0
	(MAQ/M.G.)	0.2	0.8	0.2	0.4	0.4	1.6	0.1	1.3
France	(Domestic Mx)	0.4	0.2	0.2	0.1	0.8	0.4	0.2	0.2
	(MAQ/M.G.)	0.1	0.2	0.2	0.1	0.3	0.4	0.1	0.2
United Kingdom	(Domestic Mx)	0.3	0.2	0.2	0.1	0.5	0.2	0.3	0.1
	(MAQ/M.G.)	0.2	0.2	0.2	0.1	0.3	0.4	0.1	0.2
	Rest of Europe	1.6	2.2	1.5	2.1	2.7	3.7	1.2	2.2
	Total Europe	4.1	4.5	2.9	3.2	6.9	8.0	4.7	5.3
	Rest of the World	2.2	4.6	2.7	4.5	3.3	9.0	1.4	3.4
	Total final manufacturing production	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

6 Concluding remarks.

Mexican manufacturing is composed of two sets of firms: firms primarily producing for foreign markets (Maquiladora/ M. Global) and firms primarily producing for the domestic market (Domestic manufacturing of Mexico). This paper tries to analyse how each component of the Mexican manufacturing was affected by the increasing globalisation of manufacturing production. Moreover, our research tries to identify which countries and regions from the World economy succeed in capturing most of the value added embodied in Mexican exports, as well as the extent to which Mexico itself profits from its exports.

Our value added calculations confirm that in the context of increasing globalisation of production, manufacturing firms in Mexico operate under local, regional and global value chains. Firms mostly producing for the domestic market (those in Mexico-Domestic) operate in the context of local value chains with most of the value being added by Mexico (Domestic). Firms that produce for foreign markets (those in the Maquiladora industry) participate in local, regional and global value chains depending on the manufacturing sector. Thus, in order to identify the country or region that captures the highest value added contribution in the final output produced by Maquiladora/M. Global we need to analyse the conditions and factors that affect the nature of value added contributions. Those conditions include the type of good being produced, trade and tariff incentives, as well as the competitive advantages of the Mexican economy.

The pattern where firms in Mexico (Domestic) participate in local value chains and, firms in Mexico (Maquiladora/M. Global) participate in both local and regional or global value chains is the result of the new pattern of specialisation of export producers since the beginning of the new millennium. Our results indicate that during the 1990s the total manufacturing production in Mexico was only local and regional. Mexico (Domestic) captured most of the value added embodied in its own final output, while the US captured most of the value added embodied in Maquiladora final output. The implementation of NAFTA, significant decreases in transport and communication costs and the emergence of more efficient producers in East Asia induced Maquiladora firms to specialise in manufacturing activities where Mexico offered the greatest competitive advantages, scaling down production of goods in which Mexico could not withstand the fierce international competition (textiles). The increasing globalisation of production did not induce a new pattern of specialisation for the firms in Mexico (Domestic), because those firms were not subject to significant competitive pressures (price, high quality standards, etc.) from low cost producers in supplying the domestic market.

In order to achieve success in the new patterns of specialisation, maquiladora firms had to modify their sourcing behaviour drastically. This resulted in a dramatic decline of imports of intermediate goods from the US. By 2005, maquiladora firms sourced most of their intermediate goods in the electronic industry from East Asia (China) and in the case of the transport equipment sector from Mexico. In some other manufacturing sectors, they continue to source their inputs from the US. Thus, Maquiladora firms now belong to local, regional as well as global value chains depending on the type of good being produced.

In our view, this pattern where maquiladora firms opt for global value chains in the electronic industry and for regional value chains in the transport industry (and in other manufacturing sectors) is a reflection of reallocation decisions by foreign (US)producers supplying intermediate inputs to the maquiladora industry. US producers who used to supply intermediate goods to maquiladora firms during the 1990s, reallocated their production either to East Asia (China) or to Mexico during the 2000s, in order to continue supplying intermediate goods to

maquiladora firms. Those reallocation decisions were made considering trade and tariff incentives as well as the competitive advantages offered by each country in a particular manufacturing sector.

Our research also indicates that the pursuit of industrial upgrading in the context of this new pattern of specialisation will remain a challenging task. The case of the transport equipment sector highlights to the fact that trade and tax incentives are only a necessary condition for higher levels of domestic value added content, not a sufficient one. Further regional cooperation and regulation is required between the neighbouring countries that participate in the production of the final goods. Here, we are referring to the regional cooperation between the governments of Mexico and the United States, when signing the Bilateral Aviation Safety Agreement in 2007. This agreement recognises the existence of North American production in the aerospace industry and was signed both in the interest of American firms producing in Mexico and in the interest of Mexico in acquiring technological capabilities from its neighbour. In our view, this agreement combined with tax incentives and NAFTA benefits is one of the main reasons behind the increase in the domestic value added contribution from Mexico in the transport equipment sector. This kind of regional value chain cooperation should be taken into account as a policy option for less developed economies to benefit from the increasing globalisation of production.

Finally, it is important to note that in terms of value added creation manufacturing production in Mexico still benefiting more from the production for its domestic market, production for export markets. This is the case in spite of the increasing globalisation of production, the new patterns of specialisation in the production of Mexican exports and the drastic changes in the sourcing behaviour of maquiladora firms that participate in local, regional and global value chains. During the period studied in this paper, the contribution of domestic inputs in creating value added in Mexico (Domestic) was much larger than that in Mexico (Maquiladora). This is true even if we consider the increasing domestic value added content of from maquiladora firms in the transport sector. As long as, Mexico (Domestic) has much stronger linkages with the rest of the domestic economy, the scope for maquiladora to induce industrial upgrading remains limited.

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Appendix A.1: Supply and Use and Input-Output Tables

Supply and Use tables for Mexico (Domestic) and Mexico (Maquiladora/Manufactura Global).

The first step taken by our research was to define the set-up for the supply and use tables of maquiladora/manufactura global and domestic economy of Mexico. This set up is presented in figure A.1.1.

Figure A.1.1: Supply and Use Tables for Mexico (Domestic Economy) and Mexico (Maquiladora/M. Global).

Mexico (Domestic Economy)

	Supply	Intermediate use	Final Use			Total
	Product	Industry	Final Demand	GCF	Exports	
Product		$I_{i,j}^{de}$	F_i^{de}	GCF_i^{de}	X_i^{de}	Total use by product (TU^{de})
Industry	$S_{i,j}^{de}$					Total output by industry (go^{de})
Imports	M^{de}					
		Value added				
	Total supply by product (TS^{de})	Total input by industry				

Mexico (Maquiladora/M. Global)

	Supply	Intermediate use	Final Use			Total
	Product	Industry	Final Demand	GCF	Exports	
Product		$I_{i,j}^{maq}$		GCF_i^{maq}	X_i^{maq}	Total use by product (TU^{maq})
Industry	$S_{i,j}^{maq}$					Total output by industry (GO^{maq})
Imports	M^{maq}					
		Value added				
	Total supply by product (TS^{maq})	Total input by industry				

Notes: (de) refers to Domestic Economy and (maq) refers to Maquilladora/M. Global

Let S denote supply and M imports, subscripts i and j denote products and industries respectively. Superscript (de) stands for domestic economy of Mexico and (maq) indicate maquiladora/manufactura global. Then, total supply (TS) for each product (i) will be given by the summation of supply and imports as follows;

$$TS_i^{de} = \sum_j S_{i,j}^{de} + M_i^{de} \quad (1.1)$$

$$TS_i^{maq} = \sum_j S_{i,j}^{maq} + M_i^{maq} \quad (1.2)$$

Total use (TU) should be determined by the summation of final demand (F), gross capital formation (GCF), exports (X) and intermediate use (I). This identity will only hold for the domestic economy of Mexico. In the case of the maquiladora, total use will not consider the concept of final demand given that this industry does not consume final goods. Therefore;

$$TU_i^{de} = \sum_j I_{i,j}^{de} + F_i^{de} + GCF_i^{de} + X_i^{de} \quad (2.1)$$

$$TU_i^{maq} = \sum_j I_{i,j}^{maq} + GCF_i^{maq} + X_i^{maq} \quad (2.2)$$

Then, the identity of supply and use for each concept will be given for the domestic economy as follows

$$\sum_j S_{i,j}^{de} + M_i^{de} = \sum_j I_{i,j}^{de} + F_i^{de} + GCF_i^{de} + X_i^{de} \quad (3.1)$$

And for the maquiladora;

$$\sum_j S_{i,j}^{maq} + M_i^{maq} = \sum_j I_{i,j}^{maq} + GCF_i^{maq} + X_i^{maq} \quad (3.2)$$

The second accounting identity will be written as follows:

$$\sum_j TS_{i,j}^{de} = VA_j^{de} + \sum I_{i,j}^{de} \quad \forall j \quad (4.1) \text{ for the domestic economy}$$

$$\sum_j TS_{i,j}^{maq} = VA_j^{maq} + \sum I_{i,j}^{maq} \quad \forall j \quad (4.2) \text{ for the maquiladora/m. global}$$

This identity indicates that for each industry the total value of output (at the left hand side) is equal to the total value of inputs (right hand side). The latter is given by the sum of value added (VA) and intermediate use of products.

International Supply and Use tables for Mexico (Domestic) Mexico (Maquiladora/M. Global)

With this information in mind, we proceed to calculate the international supply and use tables. An international use table is an extension of the national use table. The main difference with respect to the national use table is that the international use table explicitly indicates the use of each product by country of origin. Therefore, in order to continue a split must be made between the products that were imported and those that were domestically produced. Equations 5, 6 and 7 indicate the intermediate consumption, final demand and gross capital formation for each of the two components of the Mexican economy respectively. The first superscript (de/maq) indicates the component of the Mexican economy, while the second superscript (dom/m) indicates domestic or imported origin respectively. For instance, $I_i^{de\ dom}$ indicates the domestic intermediate consumption by the domestic economy of Mexico, and $I_i^{de\ m}$ stands for the imported intermediate consumption by the domestic economy of Mexico. Thus;

$$I_{i,j}^{de} = I_{i,j}^{de\ dom} + I_{i,j}^{de\ m} \quad \forall i,j \quad (5.1)$$
$$I_{i,j}^{maq} = I_{i,j}^{maq\ dom} + I_{i,j}^{maq\ m} \quad \forall i,j \quad (5.2)$$

$$F_i^{de} = F_i^{de\ dom} + F_i^{de\ m} \quad \forall i \quad (6)$$

$$GCF_i^{de} = GCF_i^{de\ dom} + GCF_i^{de\ m} \quad \forall i \quad (7.1)$$
$$GCF_i^{maq} = GCF_i^{maq\ m} \quad \forall i \quad (7.2)$$

In this context, equation 8 shows the supply for the domestic economy and for the maquiladora industry, respectively. As can be seen, the supply of the domestic economy contains the domestic intermediate goods produced by the domestic economy and delivered to the maquiladora ($I_{i,j}^{maq\ dom}$). Similarly, the supply of the maquiladora equals the total exports from this industry as all the production is to be exported.

$$\sum_j S_{i,j}^{de} = \sum_j I_{i,j}^{de\ dom} + \sum_j I_{i,j}^{maq\ dom} + F_i^{de\ dom} + GCF_i^{de\ dom} + X_i^{de} \quad \forall i,j \quad (8.1)$$
$$\sum_j S_{i,j}^{maq} = X_{i,j}^{maq} \quad \forall i,j \quad (8.2)$$

Finally, we also split the total imports from each component of the Mexican economy as follows:

$$M_{i,j}^{de} = I_{i,j}^{de\ m} + F_i^{de\ m} + GCF_i^{de\ m} \qquad \forall i,j \qquad (9.1)$$

$$M_{i,j}^{maq} = I_{i,j}^{maq\ m} + GCF_i^{maq\ m} \qquad \forall i,j \qquad (9.2)$$

On the basis of this information, figure A.1.2 presents a set up for the international supply and use tables for Mexico (Domestic), Mexico (Maquiladora/M. Global). Here, all the information presented in previous equation is allocated according to their use (intermediate or final) and according to their origin (domestic or imported by country of origin).

Figure A.1.2: International SUT for Mexico (Domestic), Mexico (Maquiladora/M. Global).

Mexico (Domestic Economy)

		Supply	Intermediate use	Final Use			Total
		Product	Industry	Final Demand	GCF	Exports	
Country A	Product		$I_{i,j}^{de\ m(A)}$	$F_i^{de\ m(A)}$	$GCF_i^{de\ m(A)}$		Total use of imported products delivered by A
Mexico (Domestic Economy)	Product		$I_{i,j}^{de\ dom}$	$F_i^{de\ dom}$	$GCF_i^{de\ dom}$	X_i^{de}	Total use of domestic products
Mexico (Maquiladora/ M. Global)	Product						
Rest of the World	Product		$I_{i,j}^{de\ m(RoW)}$	$F_i^{de\ m(RoW)}$	$GCF_i^{de\ m(RoW)}$		Total use of imported products delivered by RoW
Mexico (Domestic Economy)	Industry	$S_{i,j}^{de}$					TU^{de}
	Rest of the World	M_j^{de}					
			Value added (VA)				
		TS^{de}	Output				

Mexico (Maquiladora/M.Global)

		Supply	Intermediate use	Final Use			Total
		Product	Industry	Final Demand	GCF	Exports	
Country A	Product		$I_{i,j}^{maq\ m(A)}$		$GCF_i^{maq\ m(A)}$		Total use of imported products delivered by A
Mexico (Domestic Economy)	Product		$I_{i,j}^{maq\ dom}$				Total use of products delivered to Maq/M.Global
Mexico (Maquiladora/ M. Global)	Product					X_i^{maq}	X_i^{maq}
Rest of the World	Product		$I_{i,j}^{maq\ m(RoW)}$		$GCF_i^{maq\ m(RoW)}$		Total use of imported products delivered by RoW
Mexico (Maq./M.Global)	Industry	$S_{i,j}^{maq}$					TU^{maq}
	Rest of the World	M_j^{maq}					
			Value added (VA)				
		TS^{maq}	Output				

Notes: the first superscript indicates the main component being studied (Domestic Economy or Maq/M. Global) and the second superscript indicates origin from goods (domestic or imported). For instance $I_{i,j}^{mqq\ \ m(RoW)}$ indicates intermediate imports delivered by the Rest of the World to the maquiladora/m. global.

In order to construct those international use tables, we need to break down imports by country of origin and by use category. Following Timmer et al. (2014), this step requires international trade statistics that are to be benchmarked with the official data from the national accounting system by which the national SUTS were built. That step was followed in order to ensure consistency between the data in the national and international use tables.

Formally, let $m_{i,k}^{l}$ indicate the share of use categories ***l*** (intermediate, final consumption or investment) in imports of product ***I*** delivered by a particular country ***k*** to a component of the Mexican economy **α** (domestic economy or maquiladora/m.global) defined as follows.

$$m_{i,k}^{\alpha\ l} = \frac{\widetilde{M}_{i,k}^{\alpha\ l}}{\widetilde{M}_{i}^{\alpha}} \text{ such that } \sum_k \sum_l m_{i,k}^{\alpha\ l} = 1$$

where $\widetilde{M}_{i,k}^{\alpha\ l}$ is the total value from all 6-digit products that are classified by use category ***l*** and WIOD product group ***i*** imported from country ***k*** (and delivered to component **α**) , and $\widetilde{M}_{i}^{\alpha}$ the total value of WIOD product group ***i*** imported by component **α** of the Mexican economy. These shares have to be derived from the bilateral trade statistics and applied to the total imports of product ***I*** by component **α** of the Mexican economy as given in the SUT time series to derive their imported use categories. In this context $I_{i,k}^{\alpha\ m}$ is the amount of product group ***i*** imported from country ***k*** and used as intermediate by industry ***j*** in component **α** of the Mexican economy.

$$I_{i,k}^{\alpha\ m} = m_{i,k}^{\alpha\ I} M_{i}^{\alpha} \frac{I_{i,j}^{\alpha}}{I_{i}^{\alpha}} \quad \forall j$$

Where $I_{i}^{\alpha} = \sum_j I_{i,j}^{\alpha} \quad \forall i$ such that $\frac{I_{i,j}^{\alpha}}{I_{i}^{\alpha}}$ is the share of intermediates of product ***i*** used by industry ***j*** in each component **α** of the Mexican economy.

By definition, it is only the domestic economy of Mexico that demands goods for final demand and for gross capital formation. Therefore, our research did not modify that data original reported by WIOD on their international use tables for the total economy of Mexico. We simply transfer them to our international use tables and relabeled them as the final demand and gross capital formation for the Domestic economy of Mexico. Finally, in the case of the imported gross capital formation for the Maquiladora and M. Global, we obtained that data from our trade data statistics after classifying its bilateral import by its corresponding BEC category. Afterwards, we simply allocate those gross capital imports classified by product category in the columns for gross capital formation (there will be no changes in inventories for the Maquiladora/M. Global). This is because of the fact that official imported use table for the maquiladora does not provide gross capital categories so we cannot benchmarked them.

International SUT for the rest of WIOD countries including Mexico (Domestic) and Mexico (Maquiladora/Manufactura Global).

Figure A.1.3 presents the set up for an international use table for the rest of WIOD countries where Mexico (Domestic) and Mexico (Maquiladora/M. Global) are included. Here, we assume that the domestic economy of Mexico delivers goods for intermediate use, final demand and gross capital formation. On the other hand, it is assumed that the maquiladora/m. global only delivers goods for final demand. Therefore, our research decided that we only needed to calculate the columns for final demand delivered by the domestic economy of Mexico ($F_i^{a\ m(de)}$) and by Maquiladora/M. Global ($F_i^{a\ m(maq)}$). This means that the data for intermediate goods and gross capital formation demanded by WIOD countries and delivered by Mexico (as initially reported by WIOD) will remain unaltered. We will simply re-label them as the intermediate goods and gross capital formation delivered by the domestic economy of Mexico.

Figure A.1.3: International SUT for WIOD countries including Mexico (Domestic), Mexico (Maquiladora/M. Global).

			WIOD Countries (Country A)				
		Supply	Intermediate use	Final Use			Total
		Product	Industry	Final Demand	GCF	Exports	
Country A	Product		$I_{i,j}^{a\ dom}$	$F_i^{a\ dom}$	$GCF_i^{a\ dom}$	X_i^a	Total use of domestic products
Mexico (Domestic Economy)	Product		$I_{i,j}^{a\ m(de)}$	$F_i^{a\ m(de)}$	$GCF_i^{a\ m(de)}$		Total use of imported products delivered by Mexico (Domestic)
Mexico (Maquiladora)	Product			$F_i^{a\ m(maq)}$			Total use of imported products delivered by Maquiladora
Rest of the World	Product		$I_{i,j}^{a\ m(RoW)}$	$F_i^{a\ m(RoW)}$	$GCF_i^{a\ m(RoW)}$		Total use of imported products delivered by RoW
Country A	Industry	$S_{i,j}^a$					TU^a
	Rest of the World	M_j^a					
			Value added (VA)				
		TS^a	Output				

Notes: the first superscript indicates the main country being studied and the second superscript indicates origin from goods (domestic or imported). For instance $I_{i,j}^{a\ m(RoW)}$ indicates intermediate imports delivered by the Rest of the World to country A.

In calculating the final demand deliveries by Mexico (Domestic) to the rest of WIOD countries, ideally we would have to find the difference between the data originally provided by WIOD and our specific data for Mexico (Maq/M. Global). This is because, in principle, the data originally provided by WIOD in the international use tables for the rest of WIOD countries contains both Maquila and Domestic economy deliveries. In doing that, however, we found that our Maq/M. Global export data was in many case much larger than the one originally provided in WIOD for the case of Mexico. This issue is explained by the fact that (when constructing those tables) WIOD relied on the imports reported by each country and that our data for Maq/M. Global in this specific international use tables needs to rely on the data for exports. Therefore, in order to exclude negative values and ensure the consistency of our results, our research will also assume that the final demand deliveries originally reported by WIOD for the case of the total economy of Mexico correspond to the those deliveries by the Domestic Economy of Mexico.

Relying in Maq/M. Global bilateral exports is a crucial step in constructing international SUTs like the one in figure A.1.3. This is because there is no other alternative way by which we can indicate how the Maq/M. Global gross production in each of the WIOD countries. Furthermore, we are confident that aforementioned assumption will not severely bias our results given that the bulk of manufacturing exports from Maq/M. Global go to the United States.

Formally, let $x_{i,k}^{maq}$ indicate the share of final demand use in exports of product ***i*** delivered by Maq/M. Global to particular country ***k*** defined as follows.

$$x_{i,k}^{maq} = \frac{\tilde{X}_{i,k}^{maq}}{\tilde{X}_{i}^{maq}} \text{ such that } \sum_k x_{i,k}^{maq} = 1$$

where $\tilde{X}_{i,k}^{maq}$ is the total value from all 6-digit products that are classified by product group ***i*** exported by Maq/M. Global and delivered to country ***k***, and $\tilde{X}_{i}^{maq}$ the total value of WIOD product group ***i*** exported by Maq/M Global. These shares have to be derived from the bilateral trade statistics and applied to the total exports of product ***i*** from Maq/M. Global. Finally, that value is applied to the final demand share of use category from the rest of WIOD countries (as given in their SUT time series) to derive the necessary imported final use categories. In this context $F_i^{k\ m(maq)}$ is the amount of product group ***i*** imported from Maq/M. Global and used as final demand in country k

$$F_i^{k\ m(maq)} = x_{i,k}^{maq}\ X_i^{maq} \frac{FC_{i,f}^{k}}{FC_i^{k}}$$

Where $\frac{FC_{i,f}^{k}}{FC_i^{k}}$ is the share of final demand goods by use categories in country k.

Once we had all the international SUT for Mexico (Domestic), Mexico (Maquiladora/Manufactura Global) and the rest of WIOD countries, we proceeded to calculate the WIOT which is presented in Figure A.1.4. Following WIOD, we transformed all the international SUT into world input-output structure by means of the "fixed product-sales structure" assumption. This assumption states that each product has its own specific sales structure irrespective of the industry where it is produced. Sales structure here refers to the proportions of the output of the product in which it is sold to the respective intermediate and final users.

Figure A.1.4: Final set up of World Input-output Table including Mexico (Domestic) and Mexico (Maquiladora/M.Global)

		Country A Supply Industry	Mexico (Domestic Economy) Supply Industry	Mexico (Maquiladora/ M. Global) Supply Industry	Rest of the World Supply Industry	Country A Intermediate use Industry	Mexico (Domestic Economy) Intermediate use Industry	Mexico (Maquiladora/ M. Global) Intermediate use Industry	Rest of the World Intermediate use Industry	Country A Final Use	Mexico (Domestic Economy) Final Use	Mexico (Maquiladora/ M. Global) Final Use	Rest of the World Final Use	Total
Country A	Industry					$I_{j,j}^{a\ dom}$	$I_{j,j}^{de\ m(a)}$	$I_{j,j}^{maq\ m(a)}$	$I_{j,j}^{row\ m(a)}$	$F_j^{a\ dom}$, $GCF_j^{a\ dom}$	$F_j^{de\ m(a)}$, $GCF_j^{de\ m(a)}$	$GCF_j^{maq\ m(a)}$	$F_j^{row\ m(a)}$, $GCF_j^{row\ m(a)}$	Output in A
Mexico (Domestic)	Industry					$I_{j,j}^{a\ m(de)}$	$I_{j,j}^{de\ dom}$	$I_{j,j}^{maq\ de}$	$I_{j,j}^{row\ m(de)}$	$F_j^{a\ m(de)}$, $GCF_j^{a\ m(de)}$	$F_j^{de\ dom}$, $GCF_j^{de\ dom}$		$F_j^{row\ m(de)}$, $GCF_j^{row\ m(de)}$	Output in Mexico (DE)
Mexico (Maq/M.Glob)	Industry									$F_j^{a\ m(maq)}$			$F_j^{row\ m(maq)}$	Output in Mexico (MAQ)
Rest of the World (RoW)	Industry					$I_{j,j}^{a\ m(RoW)}$	$I_{j,j}^{de\ m(RoW)}$	$I_{j,j}^{maq\ m(RoW)}$	$I_{j,j}^{row\ dom}$	$F_j^{a\ m(RoW)}$, $GCF_j^{a\ m(Row)}$	$F_j^{de\ m(row)}$, $GCF_j^{de\ m(row)}$	$GCF_j^{maq\ m(row)}$	$F_j^{row\ dom}$, $GCF_j^{row\ dom}$	Output in RoW
Country A	Industry	Domestic Supply												
Mexico (Domestic)	Industry		Domestic Supply											
Mexico (Maq/M.Glob)	Industry			Domestic Supply										
Rest of the World (RoW)	Industry				Domestic Supply									
		Imports	Imports	Imports	Imports									
Total		Total Supply	Total Supply	Total Supply	Total Supply									
						Value Added	Value Added	Value Added	Value Added					
						Output in A	Output in Mexico (DE)	Output in Mexico (MAQ)	Output in RoW					

Appendix A.2: . Share of regional value added content embodied in final manufacturing output produced by Mexico (Domestic). All manufacturing sectors.

Food, Beverages and Tobacco

Share of regional value added embodied in final manufacturing output

Region	Domestic Economy of Mexico													
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
USA and Canada	8.5%	7.7%	6.4%	7.2%	6.3%	7.0%	8.0%	8.4%	8.2%	9.3%	10.4%	9.7%	10.6%	12.5%
East Asia	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.7%	0.7%
Europe	2.8%	3.2%	3.7%	2.4%	2.2%	2.4%	1.6%	1.4%	1.1%	1.4%	1.4%	1.2%	1.2%	1.4%
ROW	2.1%	1.8%	1.9%	1.8%	2.7%	2.8%	3.1%	2.4%	2.6%	2.1%	2.4%	2.4%	2.4%	2.4%
MEX (DOM)	86.2%	86.9%	87.6%	88.1%	88.4%	87.4%	86.8%	87.3%	87.6%	86.7%	85.2%	86.1%	85.2%	83.1%
Total final output	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Food, Beverages and Tobacco

Share of regional value added embodied in final manufacturing output

Region	Maquiladora									Manufactura Global				
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
USA and Canada	35.5%	31.4%	33.2%	33.6%	30.0%	32.0%	37.8%	33.0%	41.6%	49.1%	46.6%	44.4%	44.9%	44.2%
East Asia	0.8%	1.0%	0.9%	0.9%	1.1%	1.3%	1.7%	1.9%	1.8%	2.3%	2.7%	2.7%	2.9%	3.3%
Europe	1.6%	1.5%	1.6%	1.7%	2.0%	2.7%	3.1%	3.6%	2.9%	6.3%	8.5%	8.0%	7.8%	7.4%
ROW	1.5%	1.5%	1.8%	4.2%	8.2%	10.3%	12.3%	15.5%	8.2%	9.6%	12.4%	14.6%	15.0%	15.7%
MEX (DOM)	37.8%	40.7%	40.9%	36.4%	33.4%	30.7%	24.4%	24.6%	28.9%	19.1%	16.3%	18.0%	14.9%	14.1%
MEX (MAQ/ Manuf Global)	22.9%	23.9%	21.6%	23.3%	25.3%	23.0%	20.8%	21.4%	16.6%	13.7%	13.4%	12.3%	14.5%	15.3%
Total final output	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Textiles and Textile Products

Share of regional value added embodied in final manufacturing output

Region	Domestic Economy of Mexico													
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
USA and Canada	17.0%	18.0%	18.6%	16.8%	16.0%	15.5%	15.5%	13.9%	13.0%	13.6%	11.5%	11.5%	11.7%	12.4%
East Asia	2.8%	4.0%	3.8%	3.5%	3.6%	3.6%	4.1%	4.5%	3.9%	3.2%	3.3%	3.5%	3.9%	4.0%
Europe	2.9%	3.0%	2.7%	2.8%	3.2%	3.4%	3.3%	3.4%	3.4%	2.7%	2.6%	2.1%	2.1%	2.2%
ROW	3.2%	2.8%	2.9%	2.8%	2.8%	3.7%	3.4%	3.7%	3.4%	3.0%	3.1%	2.7%	2.8%	3.0%
MEX (DOM)	74.1%	72.2%	71.9%	74.1%	74.4%	73.7%	73.7%	74.6%	76.2%	77.5%	79.5%	80.1%	79.5%	78.5%
Total final output	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Textiles and Textile Products

Share of regional value added embodied in final manufacturing output

Region	Maquiladora									Manufactura Global				
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
USA and Canada	64.4%	63.0%	57.8%	55.7%	54.9%	55.9%	55.6%	52.0%	51.6%	46.8%	40.1%	43.8%	42.6%	39.0%
East Asia	2.7%	2.7%	4.1%	3.1%	3.8%	4.2%	5.2%	7.1%	7.7%	8.5%	9.1%	11.2%	13.3%	12.3%
Europe	3.0%	2.9%	3.0%	3.2%	3.0%	3.6%	3.6%	3.8%	4.3%	6.6%	6.5%	6.0%	6.3%	6.3%
ROW	1.9%	2.2%	3.4%	2.7%	2.6%	3.5%	3.5%	4.3%	4.6%	6.8%	7.8%	8.3%	8.9%	8.8%
MEX (DOM)	9.4%	10.0%	11.6%	12.3%	13.7%	11.9%	11.3%	11.4%	11.7%	12.5%	12.2%	13.4%	11.2%	12.3%
MEX (MAQ/ Manuf Global)	18.7%	19.2%	20.2%	23.1%	21.9%	20.9%	20.8%	21.3%	20.2%	18.9%	24.3%	17.2%	17.7%	21.3%
Total final output	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Leather, Leather and Footwear

Share of regional value added embodied in final manufacturing output

Region	Domestic Economy of Mexico													
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
USA and Canada	10.0%	9.1%	8.0%	7.7%	6.5%	9.1%	10.6%	8.4%	6.7%	6.0%	5.3%	4.2%	5.0%	5.8%
East Asia	0.5%	0.7%	0.5%	0.4%	0.5%	0.5%	0.6%	0.7%	0.8%	0.8%	0.7%	0.5%	0.7%	0.8%
Europe	1.9%	1.7%	1.7%	1.2%	1.3%	1.5%	1.5%	1.5%	1.5%	1.7%	1.9%	1.6%	1.7%	2.3%
ROW	1.6%	1.8%	2.1%	1.8%	1.8%	2.1%	2.8%	3.7%	4.4%	4.4%	4.4%	2.5%	3.2%	4.4%
MEX (DOM)	86.1%	86.8%	87.7%	88.8%	90.0%	86.9%	84.5%	85.7%	86.5%	87.1%	87.8%	91.1%	89.4%	86.7%
Total final output	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Leather, Leather and Footwear

Share of regional value added embodied in final manufacturing output

Region	Maquiladora									Manufactura Global				
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
USA and Canada	58.4%	59.0%	57.3%	46.4%	43.3%	44.3%	46.8%	39.3%	36.7%	31.7%	29.6%	33.0%	40.0%	33.0%
East Asia	4.9%	4.3%	4.3%	4.3%	3.6%	3.5%	3.5%	4.5%	6.0%	6.3%	4.9%	4.9%	6.7%	5.8%
Europe	4.9%	4.7%	3.6%	7.4%	10.1%	10.2%	9.6%	9.1%	10.5%	8.5%	9.5%	7.5%	5.8%	4.6%
ROW	6.4%	6.4%	7.1%	12.8%	15.5%	13.4%	10.2%	16.1%	16.9%	18.6%	21.9%	20.1%	20.4%	25.6%
MEX (DOM)	8.0%	8.1%	8.6%	8.0%	9.5%	10.4%	12.0%	12.2%	12.6%	17.0%	17.1%	14.9%	12.8%	12.9%
MEX (MAQ/ Manuf Global)	17.3%	17.5%	19.0%	21.2%	18.0%	18.3%	18.0%	18.7%	17.5%	17.9%	17.0%	19.6%	14.4%	18.2%
Total final output	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Pulp, Paper, Paper , Printing and Publishing

Share of regional value added embodied in final manufacturing output

Region	Domestic Economy of Mexico													
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
USA and Canada	8.1%	9.6%	9.7%	8.5%	7.4%	6.8%	6.7%	5.8%	5.8%	9.2%	8.5%	9.6%	9.7%	9.7%
East Asia	0.4%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.6%	0.5%	0.6%	0.7%	0.8%	0.9%	1.0%
Europe	1.2%	1.3%	1.3%	1.3%	1.5%	1.7%	1.6%	1.6%	1.5%	1.7%	1.7%	1.6%	1.8%	1.7%
ROW	0.5%	0.6%	0.8%	0.8%	0.8%	1.4%	0.8%	1.4%	0.9%	1.0%	1.1%	1.0%	1.1%	1.1%
MEX (DOM)	89.8%	87.9%	87.7%	89.0%	89.8%	89.7%	90.3%	90.7%	91.3%	87.4%	88.0%	87.0%	86.5%	86.5%
Total final output	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Pulp, Paper, Paper , Printing and Publishing

Share of regional value added embodied in final manufacturing output

Region	Maquiladora									Manufactura Global				
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
USA and Canada	66.0%	59.3%	56.6%	53.0%	52.9%	52.6%	56.1%	57.0%	57.4%	48.1%	46.1%	46.8%	46.8%	43.7%
East Asia	2.0%	2.0%	2.1%	3.5%	4.9%	5.3%	4.0%	4.4%	4.2%	4.6%	4.9%	4.9%	5.7%	6.5%
Europe	2.6%	2.3%	2.5%	2.4%	2.6%	2.8%	3.0%	3.0%	3.2%	9.5%	10.5%	9.1%	9.6%	9.4%
ROW	1.5%	1.6%	2.0%	2.1%	2.3%	2.8%	2.5%	2.9%	3.1%	5.9%	6.5%	5.3%	6.0%	6.3%
MEX (DOM)	10.0%	12.0%	14.3%	14.2%	12.4%	13.0%	12.3%	12.8%	13.8%	15.9%	12.9%	16.3%	16.2%	17.2%
MEX (MAQ/ Manuf Global)	18.0%	22.7%	22.5%	24.9%	25.0%	23.6%	22.0%	19.9%	18.2%	16.0%	19.1%	17.5%	15.6%	16.9%
Total final output	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Chemicals and Chemical Products

Share of regional value added embodied in final manufacturing output

Region	Domestic Economy of Mexico													
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
USA and Canada	8.2%	7.4%	8.7%	7.6%	7.1%	8.3%	8.6%	7.8%	8.8%	7.0%	7.3%	7.6%	6.7%	6.3%
East Asia	0.8%	0.8%	0.8%	0.8%	0.8%	0.9%	0.9%	1.1%	1.1%	1.0%	1.1%	1.1%	1.1%	1.1%
Europe	2.5%	2.1%	2.5%	2.5%	2.6%	3.8%	3.2%	3.0%	3.0%	2.2%	2.5%	2.3%	2.1%	1.9%
ROW	1.8%	2.5%	1.9%	1.6%	1.6%	1.2%	2.0%	5.2%	2.2%	1.7%	2.1%	1.9%	1.9%	1.8%
MEX (DOM)	86.7%	87.3%	86.1%	87.5%	87.9%	85.8%	85.3%	83.0%	84.9%	88.1%	86.9%	87.1%	88.1%	89.0%
Total final output	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Chemicals and Chemical Products

Share of regional value added embodied in final manufacturing output

Region	Maquiladora									Manufactura Global				
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
USA and Canada	45.2%	44.1%	47.1%	50.7%	38.7%	40.5%	38.0%	37.4%	33.4%	24.3%	23.4%	25.8%	25.1%	25.0%
East Asia	2.6%	2.4%	3.3%	6.9%	9.6%	2.7%	6.8%	6.2%	5.2%	4.7%	5.1%	4.9%	5.3%	5.1%
Europe	3.2%	2.8%	3.1%	3.4%	2.9%	3.0%	5.4%	5.3%	8.4%	18.7%	19.5%	18.2%	15.4%	14.2%
ROW	1.8%	2.3%	3.3%	3.6%	2.8%	3.1%	4.1%	5.3%	6.1%	9.9%	10.3%	9.8%	10.0%	10.0%
MEX (DOM)	28.4%	28.0%	24.3%	17.7%	26.5%	29.2%	24.5%	24.3%	24.8%	24.9%	24.8%	24.3%	24.9%	25.7%
MEX (MAQ/ Manuf Global)	18.8%	20.5%	18.9%	17.8%	19.5%	21.6%	21.3%	21.5%	22.2%	17.4%	16.9%	16.9%	19.2%	20.0%
Total final output	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Rubber and Plastics

Share of regional value added embodied in final manufacturing output

Region	Domestic Economy of Mexico													
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
USA and Canada	13.0%	12.2%	11.5%	11.4%	10.1%	10.7%	9.0%	8.1%	7.4%	9.4%	8.2%	9.1%	9.0%	10.5%
East Asia	1.1%	1.2%	1.1%	1.1%	1.1%	1.1%	1.0%	1.1%	1.1%	1.4%	1.4%	1.6%	1.9%	2.3%
Europe	2.1%	1.9%	1.9%	2.0%	1.9%	2.3%	1.8%	1.8%	1.7%	1.8%	1.7%	1.7%	1.7%	1.9%
ROW	1.4%	1.1%	1.4%	1.5%	1.2%	1.4%	1.4%	1.8%	1.5%	1.7%	1.7%	1.5%	1.7%	2.1%
MEX (DOM)	82.5%	83.6%	84.1%	84.0%	85.8%	84.5%	86.7%	87.1%	88.3%	85.7%	86.9%	86.1%	85.8%	83.2%
Total final output	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Rubber and Plastics

Share of regional value added embodied in final manufacturing output

Region	Maquiladora									Manufactura Global				
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
USA and Canada	56.3%	55.7%	53.7%	50.3%	54.0%	51.5%	49.0%	47.1%	46.1%	47.9%	44.6%	44.7%	48.6%	45.3%
East Asia	2.8%	3.2%	3.3%	4.4%	5.4%	6.2%	7.9%	8.5%	8.2%	9.7%	10.4%	10.9%	10.9%	12.8%
Europe	2.8%	2.9%	3.1%	3.0%	3.3%	3.5%	4.2%	4.8%	4.6%	7.4%	8.0%	7.3%	7.4%	8.3%
ROW	1.8%	2.2%	2.5%	2.6%	2.7%	3.1%	3.7%	4.2%	4.3%	5.3%	6.1%	5.2%	5.7%	7.1%
MEX (DOM)	15.0%	15.1%	16.5%	18.3%	15.3%	16.5%	16.8%	16.8%	17.4%	15.7%	15.0%	15.8%	14.3%	13.4%
MEX (MAQ/ Manuf Global)	21.3%	20.9%	20.8%	21.4%	19.2%	19.2%	18.4%	18.6%	19.2%	14.0%	15.9%	16.0%	13.1%	13.1%
Total final output	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Other Non-Metallic Mineral

Share of regional value added embodied in final manufacturing output

Region	Domestic Economy of Mexico													
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
USA and Canada	6.5%	6.4%	6.8%	5.6%	5.3%	5.5%	5.5%	5.2%	5.6%	5.6%	5.2%	4.9%	4.9%	5.0%
East Asia	0.5%	0.5%	0.5%	0.5%	0.6%	0.7%	0.8%	1.0%	1.0%	1.1%	1.4%	1.3%	1.4%	1.7%
Europe	1.9%	1.8%	1.7%	1.8%	1.9%	2.3%	2.1%	2.3%	2.0%	1.9%	1.9%	1.5%	1.6%	1.7%
ROW	0.8%	1.0%	0.9%	1.0%	1.1%	1.3%	1.3%	1.8%	1.2%	1.4%	1.5%	1.1%	1.2%	1.4%
MEX (DOM)	90.4%	90.3%	90.1%	91.0%	91.1%	90.3%	90.2%	89.7%	90.1%	89.9%	90.0%	91.2%	90.9%	90.2%
Total final output	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Other Non-Metallic Mineral

Share of regional value added embodied in final manufacturing output

Region	Maquiladora									Manufactura Global				
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
USA and Canada	44.6%	46.2%	46.5%	42.4%	39.4%	46.1%	41.2%	31.8%	34.5%	14.6%	18.2%	25.0%	23.3%	20.2%
East Asia	12.6%	11.3%	11.5%	11.6%	14.9%	15.8%	27.9%	36.3%	32.2%	12.1%	7.5%	5.9%	9.3%	6.5%
Europe	3.0%	3.7%	3.9%	3.8%	4.7%	4.3%	6.0%	5.6%	6.1%	4.1%	5.5%	7.0%	5.6%	5.4%
ROW	1.9%	2.9%	4.6%	4.4%	4.1%	4.1%	7.2%	8.5%	8.0%	4.2%	4.1%	4.1%	4.6%	4.3%
MEX (DOM)	17.5%	16.8%	15.1%	16.5%	15.5%	14.3%	8.3%	8.3%	9.1%	33.1%	32.3%	29.1%	28.7%	32.5%
MEX (MAQ/ Manuf Global)	20.4%	19.2%	18.4%	21.2%	21.4%	15.4%	9.3%	9.5%	10.2%	32.0%	32.4%	28.8%	28.5%	31.1%
Total final output	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Basic Metals and Fabricated Metal

Share of regional value added embodied in final manufacturing output

Region	Domestic Economy of Mexico													
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
USA and Canada	11.5%	11.1%	10.8%	9.3%	8.0%	9.2%	10.8%	10.6%	10.9%	9.7%	10.2%	8.0%	8.8%	10.8%
East Asia	1.8%	1.7%	1.8%	1.4%	1.3%	1.6%	2.2%	2.5%	2.9%	2.1%	2.5%	2.2%	2.4%	3.0%
Europe	3.6%	3.0%	2.6%	2.3%	2.3%	2.8%	3.7%	3.8%	4.0%	3.0%	3.3%	2.2%	2.2%	2.7%
ROW	3.1%	2.7%	3.0%	2.4%	2.3%	2.7%	3.8%	4.3%	5.1%	3.5%	3.8%	2.4%	2.9%	3.5%
MEX (DOM)	80.0%	81.5%	81.8%	84.6%	86.0%	83.8%	79.7%	78.8%	77.1%	81.7%	80.2%	85.2%	83.7%	80.0%
Total final output	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Basic Metals and Fabricated Metal

Share of regional value added embodied in final manufacturing output

Region	Maquiladora									Manufactura Global				
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
USA and Canada	58.3%	57.9%	58.2%	54.8%	55.5%	52.9%	48.6%	48.2%	46.9%	39.9%	36.7%	36.5%	38.2%	34.9%
East Asia	3.2%	3.3%	4.0%	5.0%	6.1%	5.9%	8.5%	9.1%	10.0%	9.7%	10.4%	11.6%	12.8%	15.2%
Europe	2.9%	2.9%	3.1%	3.1%	3.3%	3.2%	4.3%	5.0%	5.3%	7.2%	7.4%	6.5%	7.6%	7.7%
ROW	2.2%	2.6%	2.9%	3.8%	3.3%	3.7%	5.2%	5.9%	6.4%	6.3%	6.5%	5.4%	6.7%	7.1%
MEX (DOM)	16.9%	14.4%	13.8%	15.0%	14.4%	15.4%	15.7%	16.2%	17.3%	20.4%	20.6%	21.0%	16.9%	17.0%
MEX (MAQ/ Manuf Global)	16.4%	18.9%	18.0%	18.2%	17.4%	18.8%	17.6%	15.6%	14.1%	16.5%	18.3%	19.0%	17.8%	18.1%
Total final output	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Machinery, Nec

Share of regional value added embodied in final manufacturing output

Region	Domestic Economy of Mexico													
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
USA and Canada	11.1%	8.7%	9.5%	9.1%	8.3%	8.2%	9.0%	8.6%	7.8%	8.5%	7.9%	15.8%	17.6%	18.5%
East Asia	1.5%	2.2%	1.5%	1.6%	1.5%	1.4%	1.8%	1.8%	1.9%	1.3%	1.5%	2.9%	3.4%	3.7%
Europe	2.6%	1.9%	2.5%	2.4%	2.0%	2.0%	2.5%	2.5%	2.4%	2.4%	2.7%	5.3%	5.1%	5.6%
ROW	1.1%	0.8%	1.0%	1.6%	1.3%	1.3%	1.6%	1.7%	1.7%	1.5%	1.6%	2.5%	3.2%	3.4%
MEX (DOM)	83.7%	86.4%	85.4%	85.3%	86.8%	87.1%	85.2%	85.4%	86.3%	86.2%	86.3%	73.4%	70.7%	68.9%
Total final output	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Machinery, Nec

Share of regional value added embodied in final manufacturing output

Region	Maquiladora									Manufactura Global				
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
USA and Canada	67.0%	66.4%	62.7%	43.5%	31.8%	25.9%	24.1%	24.9%	26.0%	21.4%	21.7%	24.2%	24.2%	23.4%
East Asia	5.3%	6.7%	4.9%	13.9%	23.8%	27.8%	30.1%	28.0%	26.6%	19.5%	16.9%	26.2%	31.1%	29.6%
Europe	3.5%	3.2%	3.1%	4.2%	5.6%	6.0%	7.1%	7.6%	7.7%	7.8%	8.2%	9.2%	8.6%	8.7%
ROW	2.6%	3.2%	3.3%	8.6%	11.7%	12.3%	12.0%	12.8%	12.9%	9.4%	9.0%	11.8%	12.7%	12.3%
MEX (DOM)	8.1%	7.4%	10.2%	11.3%	11.3%	11.8%	11.2%	13.2%	14.5%	19.8%	20.9%	11.2%	10.1%	11.1%
MEX (MAQ/ Manuf Global)	13.4%	13.1%	15.8%	18.4%	15.8%	16.2%	15.5%	13.4%	12.4%	22.0%	23.4%	17.4%	13.3%	14.9%
Total final output	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Electrical and Optical Equipment

Share of regional value added embodied in final manufacturing output

Region	Domestic Economy of Mexico													
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
USA and Canada	35.3%	32.0%	32.5%	33.5%	27.3%	27.3%	23.3%	23.8%	24.6%	32.2%	31.4%	29.8%	29.9%	31.0%
East Asia	6.6%	11.9%	7.8%	8.1%	10.1%	10.2%	13.7%	15.7%	16.0%	11.4%	11.2%	13.0%	14.3%	14.7%
Europe	10.0%	10.1%	11.5%	10.7%	9.3%	10.6%	11.9%	11.9%	11.2%	8.4%	8.5%	7.9%	8.1%	8.3%
ROW	3.0%	2.1%	6.0%	3.6%	8.3%	8.2%	9.6%	8.0%	7.4%	6.1%	6.1%	5.9%	6.7%	6.7%
MEX (DOM)	45.2%	44.0%	42.2%	44.2%	45.0%	43.6%	41.5%	40.7%	40.8%	41.9%	42.8%	43.3%	40.9%	39.3%
Total final output	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Electrical and Optical Equipment

Share of regional value added embodied in final manufacturing output

Region	Maquiladora									Manufactura Global				
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
USA and Canada	69.6%	66.3%	65.2%	55.3%	50.3%	50.3%	40.0%	32.5%	28.1%	26.1%	25.3%	24.0%	24.3%	25.7%
East Asia	8.7%	10.0%	9.6%	15.7%	20.9%	19.9%	26.9%	31.8%	37.9%	36.3%	38.6%	41.0%	40.9%	39.2%
Europe	3.8%	3.8%	3.9%	4.3%	4.6%	5.5%	7.8%	8.3%	7.8%	8.6%	8.5%	7.2%	7.4%	7.8%
ROW	3.6%	4.1%	4.8%	5.9%	6.7%	7.5%	10.0%	11.9%	11.4%	9.8%	9.6%	9.1%	9.8%	10.6%
MEX (DOM)	5.0%	5.7%	6.1%	6.9%	6.9%	7.0%	6.6%	6.4%	6.0%	9.9%	9.6%	10.2%	9.5%	8.6%
MEX (MAQ/ Manuf Global)	9.3%	10.1%	10.5%	11.8%	10.6%	9.7%	8.7%	9.0%	8.8%	9.4%	8.3%	8.5%	8.0%	8.2%
Total final output	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Transport Equipment

Share of regional value added embodied in final manufacturing output

Region	Domestic Economy of Mexico													
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
USA and Canada	27.0%	26.9%	26.7%	25.3%	25.1%	24.1%	24.1%	22.2%	20.2%	18.8%	18.3%	15.9%	17.9%	19.0%
East Asia	2.0%	2.6%	2.9%	2.6%	2.6%	2.5%	3.3%	3.6%	5.0%	6.1%	5.8%	4.9%	7.7%	7.8%
Europe	5.1%	5.1%	5.4%	5.0%	5.2%	5.5%	5.7%	6.0%	6.2%	5.5%	5.8%	6.1%	4.3%	4.5%
ROW	1.2%	1.3%	1.8%	1.9%	2.0%	2.9%	2.6%	3.2%	2.8%	4.1%	4.3%	2.9%	2.8%	3.0%
MEX (DOM)	64.7%	64.1%	63.2%	65.1%	65.2%	64.9%	64.4%	65.0%	65.7%	65.5%	65.9%	70.2%	67.2%	65.7%
Total final output	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Transport Equipment

Share of regional value added embodied in final manufacturing output

Region	Maquiladora									Manufactura Global				
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
USA and Canada	71.7%	68.8%	66.5%	65.4%	64.0%	61.6%	56.4%	52.2%	49.6%	35.4%	31.6%	31.6%	29.5%	31.3%
East Asia	3.5%	4.6%	4.4%	3.6%	3.9%	4.8%	7.7%	9.7%	10.1%	7.4%	7.6%	6.7%	7.8%	8.6%
Europe	3.2%	3.3%	3.6%	3.6%	3.8%	4.3%	5.6%	5.7%	6.1%	7.6%	9.3%	9.5%	6.0%	6.1%
ROW	2.1%	2.7%	3.2%	2.8%	2.8%	2.9%	4.0%	5.2%	5.9%	4.5%	5.0%	3.9%	3.4%	3.9%
MEX (DOM)	6.5%	6.7%	6.7%	7.1%	7.6%	9.2%	9.6%	10.1%	11.4%	22.8%	23.7%	25.2%	31.6%	28.1%
MEX (MAQ/ Manuf Global)	13.0%	13.9%	15.6%	17.4%	17.8%	17.2%	16.6%	17.2%	17.0%	22.2%	22.8%	23.2%	21.7%	22.1%
Total final output	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Manufacturing, Nec; Recycling

Share of regional value added embodied in final manufacturing output

Region	Domestic Economy of Mexico													
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
USA and Canada	21.7%	17.9%	21.7%	19.3%	16.8%	21.3%	23.5%	20.3%	20.0%	19.6%	18.8%	19.9%	20.0%	21.2%
East Asia	1.5%	6.1%	1.6%	1.6%	1.7%	1.8%	1.8%	2.3%	2.6%	2.7%	2.9%	2.8%	3.2%	3.2%
Europe	2.9%	2.4%	2.3%	3.0%	2.7%	2.6%	3.0%	4.1%	4.1%	3.5%	3.3%	2.7%	2.9%	2.8%
ROW	1.8%	1.8%	2.2%	2.2%	5.7%	2.4%	2.6%	3.3%	3.3%	3.5%	3.7%	3.1%	3.7%	3.8%
MEX (DOM)	72.2%	71.7%	72.1%	73.9%	73.1%	71.9%	69.0%	70.0%	70.0%	70.8%	71.3%	71.5%	70.2%	69.1%
Total final output	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Manufacturing, Nec; Recycling

Share of regional value added embodied in final manufacturing output

Region	Maquiladora									Manufactura Global				
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
USA and Canada	67.0%	60.0%	63.4%	44.0%	32.9%	41.6%	33.4%	26.2%	23.5%	13.8%	15.7%	20.0%	22.8%	23.1%
East Asia	6.1%	7.5%	5.0%	20.8%	31.4%	18.6%	20.8%	24.6%	20.1%	34.1%	29.6%	28.7%	27.2%	27.3%
Europe	3.1%	3.3%	3.0%	3.1%	3.8%	5.5%	8.8%	9.1%	9.8%	10.1%	11.7%	10.7%	12.0%	12.3%
ROW	2.5%	7.2%	3.9%	4.9%	6.0%	7.5%	12.2%	14.9%	19.9%	12.7%	13.3%	12.7%	14.8%	14.6%
MEX (DOM)	7.3%	7.1%	8.1%	9.0%	8.1%	8.5%	7.7%	7.7%	7.9%	10.2%	9.5%	9.0%	7.1%	7.0%
MEX (MAQ/ Manuf Global)	14.0%	15.0%	16.7%	18.3%	17.8%	18.3%	17.1%	17.5%	18.7%	19.1%	20.1%	18.8%	16.0%	15.8%
Total final output	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

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