



Growing Together: Economic Ties between the United States and Mexico

A Regional Manufacturing Platform

By Christopher Wilson

#USMxEcon



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Project Introduction

The impact of trade and globalization on the average American has become a core issue in this year's elections. We have heard measured, well-founded and serious critiques on the handling of issues like currency manipulation and preparing our workforce for participation in the global economy, but the conversation has also drawn many passionate and visceral responses, highlighting the intensity with which citizens feel the impact of economic change. Due to campaign rhetoric, Mexico has come to symbolize much of the U.S. encounter with globalization. Given that Mexico is the United States' second largest export market, third largest overall trading partner, and the top country of origin for immigrants living in the country, this is understandable. Nonetheless, having become a top tier issue in the presidential elections, it is more important than ever that Americans have a clear and up-to-date understanding of Mexico and, in particular, the U.S.-Mexico economic relationship.

With that in mind, the Mexico Institute is pleased to announce the launch of a new project, *Growing Together: Economic Ties between the United States and Mexico*, which explores the bilateral economic relationship in detail to understand its nature and its impact on the United States. We have commissioned original research on the employment impact of bilateral trade on the U.S. economy, performed original analysis using government and academic datasets, and have undertaken an extensive review of existing research relevant to the U.S.-Mexico economic relationship. Beginning today and continuing throughout the fall of 2016, the Mexico Institute will release the findings of our research on our website and social media, using the hashtag #USMXEcon.

Our study concludes that the economic relationship with Mexico, though not without its challenges, provides concrete benefits, strengthening the competitiveness of American firms, creating jobs in the United States, and generating savings for the average American family. Learn more about the project and its key findings at <http://bit.ly/USMXEcon>.

Christopher Wilson
Duncan Wood

A Regional Manufacturing Platform

By Christopher Wilson¹

Since the 1990s, trade between the United States and Mexico has grown tremendously, with bilateral goods and services trade in 2015 reaching a total six times greater than before the North American Free Trade Agreement (NAFTA) was implemented in 1993.² In 2015, bilateral trade reached \$584 billion dollars, meaning that the United States and Mexico trade more than a million dollars' worth of goods and services every minute. The United States is Mexico's top export market, and Mexico is the second largest foreign buyer of U.S. goods, second only to Canada. The bilateral trade relationship is enormous in size, and the U.S. and Mexican economies each depend significantly upon one another.

As impressive as it is, the magnitude of the U.S.-Mexico trading relationship is probably not its most important feature. Instead, it is the deepening of manufacturing integration between the United States and Mexico that has truly changed the nature of the bilateral economic relationship. The United States and Mexico do not simply sell finished products to one another, but rather produce them together. Supply chains criss-cross the U.S.-Mexico border, such that parts and materials often cross the border multiple times during the course of production.

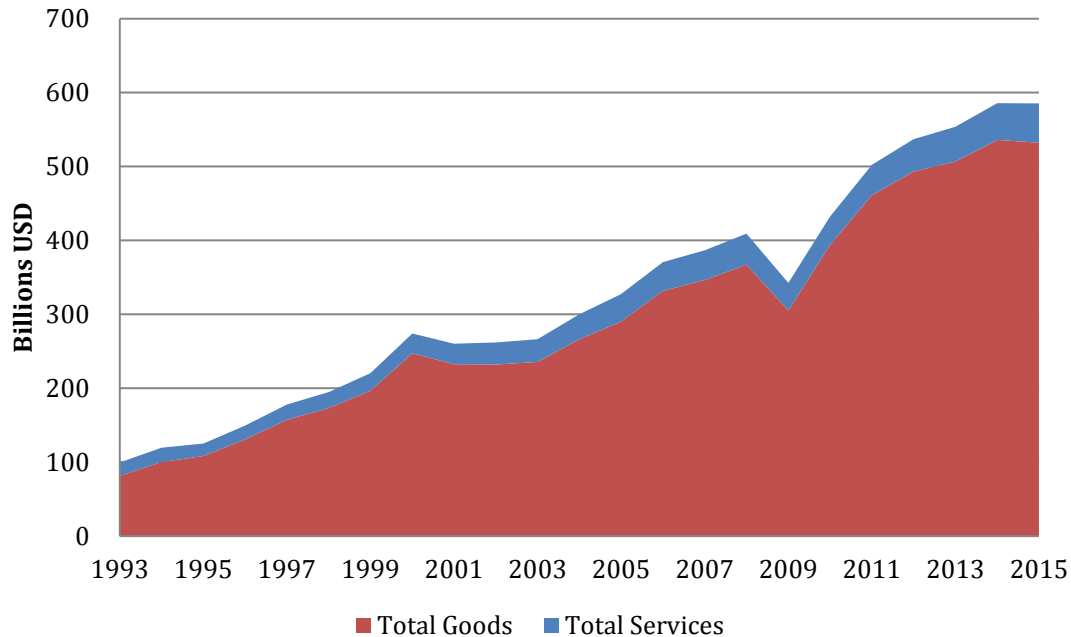
Mexican oil, for example, might be sent to the United States to be refined and turned into raw plastic in Louisiana, before being sent to an injection molder in the U.S. Midwest that creates the components for a car's dashboard. Those parts might return to Mexico for assembly at a factory along the border and then used in the final production of a car in the Bajío. Most of those cars would probably return to the United States to be sold to consumers, but they may very well be shipped to customers around the world as well. Through these types of operations, the main components of cars built in North America have been found to cross the United States' borders with Canada and Mexico an average of eight times as a vehicle is being produced.³ With such deep integration, there is no longer any such thing as an American car, a Canadian car, or a Mexican car. There are only North American cars, incorporating parts and materials from across the continent. Although competition can, does, and should still exist between producers on both sides of the border, at this point the United States and Mexico are better conceived as business partners working together to improve the competitiveness of their joint operations than as competitors fighting for market share.

¹ I would like to thank Miguel Toro and Andrea Conde for their valuable research assistance in the preparation of this article.

² Author's calculation with data from the U.S. Census Bureau, Bureau of Economic Analysis, and the OECD. Please note there was a change in definitions used to collect services trade data, so the 1993-1998 OECD data and the 1999-2015 BEA data are not directly comparable. Total trade refers to the sum of imports and exports.

³ Robert Pastor, "The Future of North America," *Foreign Affairs*, July/August, 2008, 89.

Figure 1. U.S.-Mexico Trade in Goods and Services (1993-2015)



Source: U.S. Census Bureau for goods trade; U.S. Bureau of Economic Analysis and OECD for services trade. See footnote two for more details.

Since NAFTA was implemented in 1994, complex cross-border value chains have become the defining characteristic of the U.S.-Mexico economic relationship, but with only traditional trade statistics, it was for years very difficult to measure and monitor the depth of economic integration that was occurring. Regular trade data can tell us that bilateral trade has grown more than six-fold since 1993 to its current level of more than a half-trillion dollars, and while that is huge growth and an impressive total, it does little to describe the unique nature of the U.S.-Mexico manufacturing partnership that has developed over the past decades. This short essay will look at a number of newer datasets to learn what we can about the development and current status of production sharing networks between the United States and Mexico.

Intra Industry and Intra Firm Trade

Traditionally, the expectation was that when two countries trade, each would specialize in creating the types of goods they produce best. In the context of U.S.-Mexico trade, this would mean that Mexico specializes in labor intensive production, and the United States in capital intensive industries. While this type of specialization has played out to a certain extent, trade between the two countries is largest in product categories in which both countries have large, specialized industries. In fact, the top four broad categories of U.S. exports to Mexico are also the top four categories of Mexican exports to the United States: machinery, vehicles, electrical machinery, and mineral fuels.⁴ This suggests a very high degree of intra industry trade between the United States and Mexico, and measurements for each of the United States' top trading partners support such a

⁴ Though the order of importance of the four categories differs for Mexico and the United States, at the two digit HS level these are the top four export categories for each. United States Trade Representative, <https://ustr.gov/countries-regions/americas/mexico>, 2016.

conclusion. As seen in Table 1, only U.S. trade with Canada demonstrates a higher degree of intra industry trade. High levels of intra industry trade do not necessarily signify vertical integration (joint production), but they do show us that bilateral trade among the relevant nations does not simply consist of exchanges of wine for cloth—to cite Ricardo’s famous example—or avocados for grains.

Table 1. Intra Industry Trade with Top U.S. Trading Partners⁵

Grubel-Lloyd Index of Intra Industry Trade, 2015	
Canada	63%
Mexico	53%
Germany	52%
Japan	41%
China	20%

Not only does a large portion of U.S.-Mexico trade take place within the same industries, but also within the same companies. Since 1993, the total stock of bilateral foreign direct investment has grown from \$16 billion USD to \$109 billion. When U.S. and Mexican companies open up subsidiaries in the other country, they tend to develop cross-border trading networks to supply their operations. In 2012 (the most recent year for which this data is available), bilateral trade between U.S. and Mexican parents and their majority-owned affiliates operating in the other country represented \$97.9 billion dollars, or 19 percent of all U.S.-Mexico trade in goods.⁶ Some of this intra firm trade takes place in wholesale and retail networks, but by far the largest part of bilateral intra firm trade is in the manufacturing sector.⁷ This suggests that a very large portion of the intra firm trade within the region happens within the context of the joint production platform for manufactured goods throughout North America. Businesses in the region have created highly competitive value chains that span the continent, taking advantage of economies of scale and the unique comparative advantages of each country in North America.

⁵ Calculated by the author using 2015 data from the U.S. Census Bureau at the 4-digit level of the North American Classification System (NAICS).

⁶ Calculated by the author using U.S. Bureau of Economic Analysis 2012 data on FDI in the United States and U.S. MNE Activities, as well as total trade data from the U.S. Census Bureau.

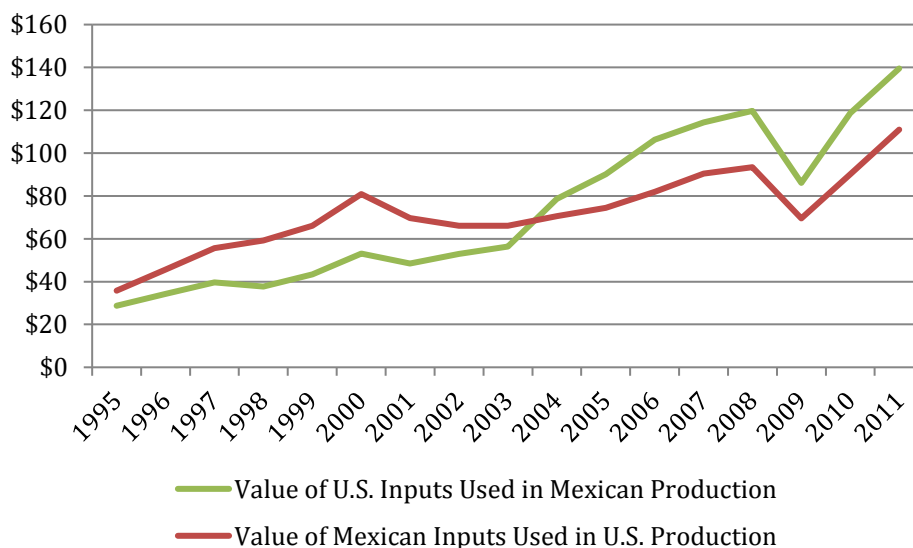
⁷ There is almost certainly additional intra firm trade between the United States and Mexico not included in the numbers cited here, which would include trade between the U.S. and Mexico-based subsidiaries of European, Asian, or other parent companies.

Cross-Border Supply Chains

Of course, most of the value chains in the region involve not only the participation of multiple facilities of a single firm, but rather a complex web of suppliers, material makers, and assembly plants involving numerous companies. The World Input-Output Database allows one to track the use of intermediate goods produced in one country, which are then traded and used as inputs for production in another country.⁸ In 2011, the most recent year for which this data is available, Mexican industries consumed \$140 billion dollars in U.S. intermediate goods, and U.S. industries consumed \$111 billion dollars' worth of Mexican inputs. This is direct evidence of joint production taking place between the United States and Mexico on a massive scale.

Though this data is not directly comparable to trade data and any attempt to do so should be taken with a grain of salt, comparing these figures to U.S. and Mexican imports and exports for the same year is revealing. If each Mexican input used in U.S. production in 2011 was also imported in 2011, they would account for 42 percent of all U.S. imports from Mexico. In the same sense, if each U.S. input used in Mexican production in 2011 was imported during that year, those transactions would account for 71 percent of all U.S. exports to Mexico. Figure 2 shows the growth in the use of inputs from across the border in U.S. and Mexican production since 1995. In 2011, the two countries used a combined \$251 billion dollars in inputs from each other, growing nearly four-fold from the \$65 billion in cross-border inputs used in 1995. As neighbors, and through NAFTA, the United States and Mexico have come to be tightly bound together, contributing extensively to each other's systems of production.

Figure 2. Value of Foreign Inputs for Domestic Production, Billions of USD (1995-2011)



Source: Author's calculations with data from World Input-Output Database, <http://www.wiod.org/>, 2016.

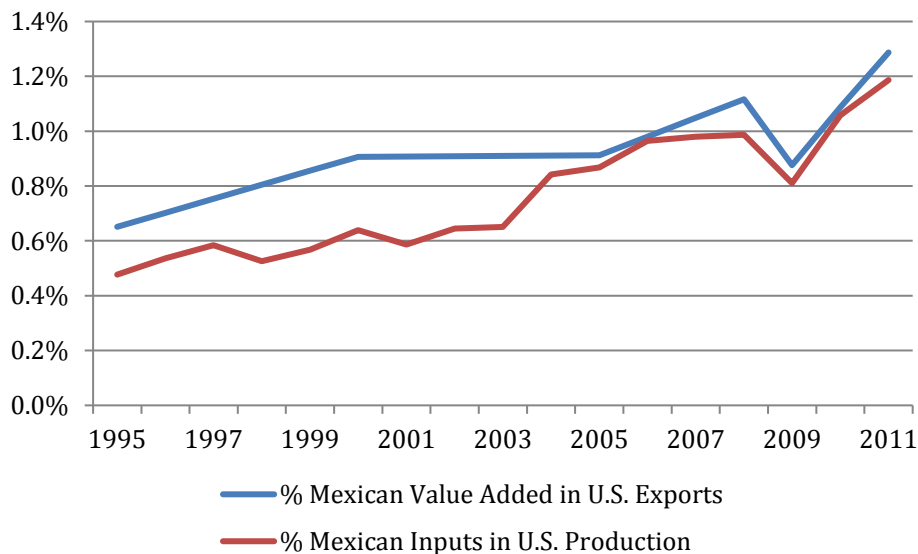
⁸ Timmer, M. P., Dietzenbacher, E., Los, B., Stehrer, R. and de Vries, G. J. (2015), "An Illustrated User Guide to the World Input-Output Database: the Case of Global Automotive Production", *Review of International Economics*, 23: 575-605

Trends in Production Sharing

Even as the value of U.S. and Mexican participation in each other's supply chains has continued to grow consistently, some important developments can be appreciated by viewing how the relative share of this participation has changed over time and by analyzing related data from the recently created WTO/OECD Trade in Value Added Database (TiVA). The TiVA numbers distinguish between gross trade, or traditional import and export statistics that capture the full value of a product each time it crosses an international boundary, and value added trade, which separates out the foreign and domestic content of traded goods and services. These figures allow us to look at the extent to which intermediate goods traded between the United States and Mexico end up embodied in each country's gross exports. Interestingly, and logically, we see in Figures 3 and 4 that the share of a country's inputs used in another country's production and the share of a country's value added embodied in another country's exports are closely related.

For Mexico, and its participation in U.S. production, the story is simple. It is one of continual growth. Just as the absolute value of Mexican inputs used in U.S. production has experienced secular growth since the 1990s, so has the Mexican share of all the intermediate goods used as inputs for production in the United States and the percent of Mexican value added embodied in U.S. exports to the world (see Figure 3). This shows us U.S. industries are finding that by relying on Mexican suppliers, they can improve the productivity and competitiveness of their businesses. The percentages of Mexican participation in U.S. exports and intermediate goods consumption are overall still relatively low, reflecting the massive size of the U.S. economy and robust domestic supply chains (which produce a full 85 percent of the value in U.S. exports), but the continuous growth of Mexican participation demonstrates the value producers are finding in regionalizing their supply chains.

Figure 3. Mexican Share of Inputs for U.S. Production and Mexican Value in U.S. Gross Exports (1995-2011)

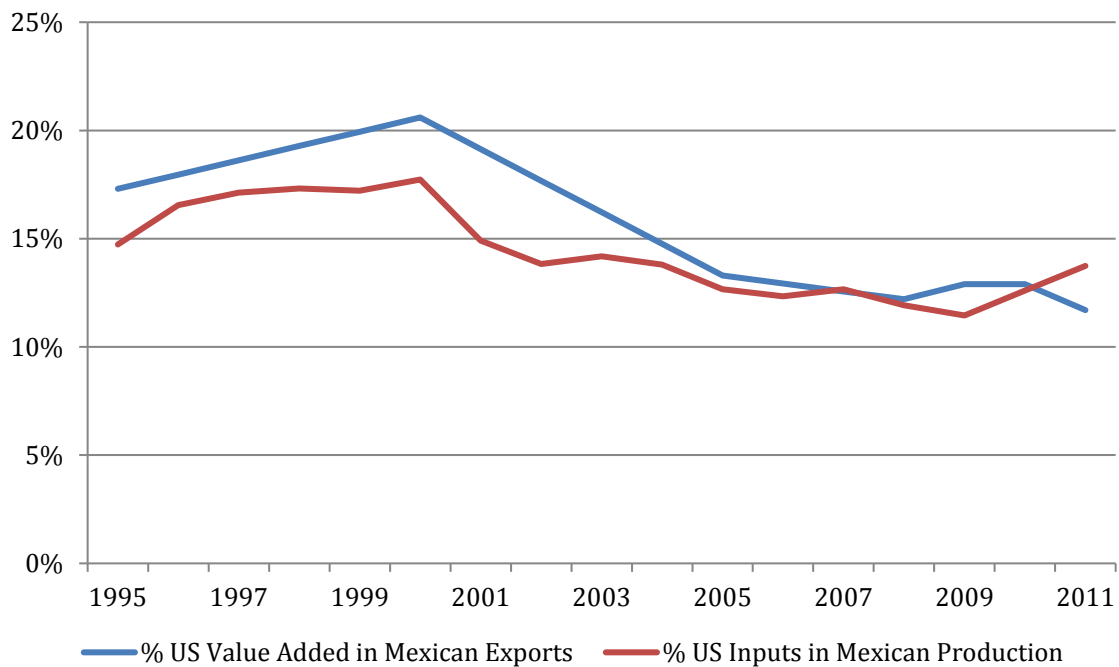


Source: OECD-WTO, Trade in Value Added Database, 2016; and author's calculation based on data from the World Input-Output Database, <http://www.wiod.org/>, 2016.

As shown in Figure 2, the United States sells even more inputs to Mexico than Mexico sells to the United States. Given that Mexico sends approximately 80 percent of its gross exports to the United States, it should be no surprise that the vast majority of the inputs sent from the United States to Mexico make their way back to consumers in the United States. In this sense, a study using data from 2004 found that U.S. imports of final goods from Mexico contained 40 percent U.S. value added, a number significantly larger than was found for U.S. imports from any other country included in the study (other examples: 25% for Canada; just 4% for China).⁹

Nonetheless, the portion of total inputs used in Mexican production that come from the United States, as well as the U.S. value embedded in Mexican exports, has experienced some ups and downs (See Figure 4). During the 1990s, after the passage of NAFTA, both measures rose, but as value chains became more global and China in particular grew its participation in global systems of production, the U.S. share fell.¹⁰ Rising wages in China and improved productivity in U.S. manufacturing operations may mean that the tide is again turning. Although the data is not yet clear, the growth in the share of U.S. inputs used in Mexican manufacturing in 2010 and 2011 suggests we may be at another inflection point.

Figure 4. U.S. Share of Inputs for Mexican Production and U.S. Value in Mexican Gross Exports (1995-2011)



Source: OECD-WTO, Trade in Value Added Database, 2016; and author's calculation based on data from the World Input-Output Database, <http://www.wiod.org/>, 2016.

⁹ Robert Koopman, William Powers, Zhi Wang, and Shang-Jin Wei, "Give Credit Where Credit Is Due: Tracing Value Added in Global Production Chains," NBER Working Paper No. 16426, Cambridge, MA, September 2010, Revised September 2011.

¹⁰ Other potential drivers of this decrease include dual recessions in the United States, the thickening of the U.S.-Mexico border following the terrorist attacks of September, 2001, and China joining the WTO.

These data support previous research on U.S.-Mexico and broader North American integration, showing a clear growth in regional integration throughout the 1990s and then a decline in certain measures of integration during the first decade of the 2000s. Other measures of integration, such as the simple value of cross-border trade, show continued growth throughout the period. As a result, there has been some debate over the status of regional integration among scholars, with some interpreting data as a sign of regional dis-integration, others as a natural consequence of economic growth in emerging economies (i.e. when China grows rapidly, its share of trade with North America rises, causing a natural decline in the U.S. or Mexican share).¹¹ I tend to put more weight in the second argument, especially given the continued growth of absolute U.S. participation in Mexican value chains and the overall strength of the North American economy, but there is no space for complacency. There are plenty of reasons to believe that the thickening of the U.S.-Mexico border after the terrorist attacks of 9/11 did indeed raise costs for those employing regional production sharing,¹² and there are a wide range of domestic and binational policy initiatives that should be implemented to strengthen regional competitiveness, ranging from infrastructure planning and investment to education reform, strengthened workforce training programs, and improved labor mobility, to name a few.

¹¹ See, Christopher Wilson, "Introduction," *Is Geography Destiny: A Primer on North America*, Washington, DC: Woodrow Wilson International Center for Scholars, 2014.

¹² See, Christopher Wilson, editor, *Anatomy of a Relationship: A Collection of Essays on the Evolution of U.S.-Mexico Cooperation on Border Management*, Washington, DC: Woodrow Wilson International Center for Scholars, 2016.

Conclusions

The United States and Mexico are profoundly linked, with value chains that span the region and criss-cross the border. This deep level of integration has important consequences for the regional economy and for the policy makers charged with its management. First, the business cycles of the United States and Mexico are now tightly linked. The two countries experience growth and recession together, necessitating coordination and communication on issues of macroeconomic management. Second, the United States and Mexico are linked in terms of productivity and competitiveness. Productivity enhancing reforms or investments in either country increase the competitiveness of that country's contribution to regional value chains, thereby increasing the competitiveness of the region as a whole. Finally, the integrated nature of the regional manufacturing platform creates a multiplier effect on the importance of trade and border management. Every time cargo crosses a border, there are costs associated with it—whether tariffs, transportation costs, added costs and time lost to border congestion, the costs associated with filing the proper import and export paperwork, or others. Time lost to border congestion is of increasing concern given the use of just-in-time supply chains by producers and the demand on the part of consumers for product to arrive at their doorstep in a matter of one or two days. In the case of the U.S.-Mexico border, which is often crossed multiple times during the production process, each of those border costs end up being paid multiple times. The negative side of this is that even small inefficiencies in the management of the border can easily add up to have major impacts on regional competitiveness. The positive side, though, is that infrastructure investments and process improvements that make U.S.-Mexico border and regional logistics operations more efficient tend to have a very high return on investment.

The shared North American production platform is already among the most competitive in the world. With attention to maintaining and growing the regional value chains that comprise the platform, the unique assets that each country in the region brings to the table will ensure that its status as a world leader endures.